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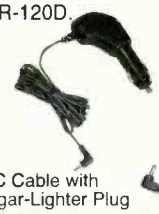

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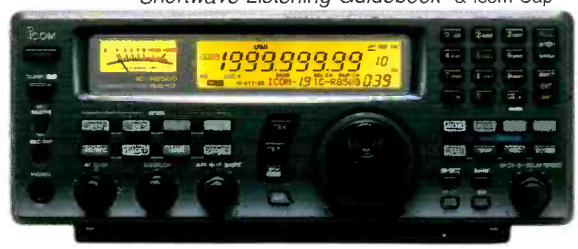

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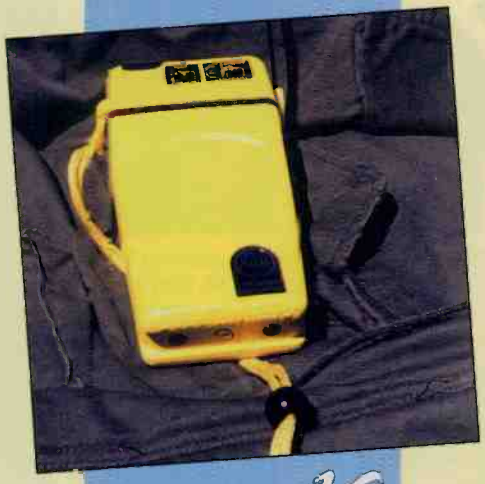

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Departments

On The Cover

The Three Mile Island Unit 1 cooling towers loom over Goldsboro in Pennsylvania's York County, ever-present reminders of the 850 megawatts of electricity constantly pumped into the region's power grid—enough to power 500,000 homes. Plants such as this one conduct emergency drills in conjunction with local emergency communicators to ensure the public's safety in the event of a disaster. Be sure to read this month's Homeland Security column by Rich Arland about how Luzerne County (PA) ARES EmComm volunteers train and drill in order to be prepared if the worst happens. (Photo by Jason Plotkin, *York Daily Record*)

by Harold Ort, N2RLL, SSB-596

"It's Hard To Reform"

Those were the words of House Speaker Rep. (R) Dennis Hastert this evening as the overhaul of the intelligence system recommended by the 9/11 Commission failed passage. Amazing, isn't it? Nearly three and a half years after the tragic events of 9/11/2001 and we still can't get it together. One has to wonder what it takes to get their attention—or *ours* for failing to jack them in the posterior to listen and act. We talk a good game, but when it comes to our leaders it's apparent that many of us enjoy being led around by the collar, only to wake up when it's sometimes too late.

Frankly, I've seen it up close and personal and I realize that it's no picnic to get the military services and all the three-lettered agencies to share information without creating 10 additional agencies to oversee operations. Cost in the bureaucrat's mind isn't like figuring cost in our mind. Ordinary folks don't spend money we don't have or invite the family and neighbors in for a discussion on which supermarket to buy hot dogs from; we think it out logically and get the job done.

Now, I mention the failed intelligence reform not just as an example of our changed world, but because as emergency users of the radio spectrum and monitors we're a vital part of the intelligence and democratic process (or should be, and not just nodding in bobble-head agreement at government press releases and what we see on The Tube), and because as communicators and listeners we have a vested interest in our own safety and that of our families and neighbors.

Reducing things to the least common denominator usually helps me get a better grasp on what those in charge would have us believe is very complicated. You know the line: "you just don't understand, because it's not that easy." Baloney. We need a National Intelligence Director and *new* agencies like I need another computer monitor and keyboard. One of each works just fine *if* I'm smart enough to learn how to use it.

So it is with our intelligence gathering. We can always use more agents in the field, because human intelligence—boots on the ground—is worth *far* more than another bazillion dollar eye in the sky, 007 hard drive, or Osama videotape analysis. (Am I the only one asking why it is that with all our high-tech gizmos, monitoring stations, spy gear, and especially added buckaroos to fight the "war," an overseas TV network can manage to get those videotapes yet our three-lettered agencies can't get *him*)? My gut tells me they'd find *you or me* if we owed the IRS $100 in back taxes and we were hunkered down in a cave with our scanners and radios.

The boiled-down answer to most of our problems is really very simple, indeed: Hire qualified communicators, give them the plan, insist they *communicate* with other folks, ditch the turf wars, and hold them accountable, or can them—or can yourself and move on to something else if you aren't doing the peoples' work.

It works the same way when putting a radio communications plan in place. Buy the best equipment the budget will allow, or ask for more money *if* it would better serve the department's needs (which in turn serves the peoples' needs). Professionally install and test the equipment with real officers and dispatchers. Have a buy-back provision of sorts if the goods don't perform as advertised during a specified time period. I'm not a government purchasing agent, but you get the idea.

Since our politicians use 9/11 as a reference point and barometer for measuring our readiness and daily terror alert status, I thought it appropriate to take a stab at doing something similar. It only requires some basic arithmetic and a gut-feeling, which most of us have, but is something usually lacking in a politician's DNA makeup.

Very recently residents of Philadelphia, Pennsylvania, were *again* without the protection of their $54 million public safety radio system. Yes, it failed again for a few hours. I'm really not sure who should take the blame for the failures, whether it's Verizon or poor planning on the part of a particular building's personnel responsible (key word) for Verizon power lines and battery systems left unattended over the weekend, thereby draining the batteries. But the fact is that for an extended period during the wee hours on that recent Sunday morning Philadelphia's police and fire radio communications were operating on a limited backup system, leaving residents and public safety professionals at risk.

At a minimum, the proverbial communications chain of command didn't work, which brings us full circle, and right back to one of the simple common denominators found by the 9/11 Commission: people aren't talking to each other and sharing information. It's really not the batteries' fault, nor the cables or connections. Philadelphia doesn't need a more expensive radio system or different radios. They, like many other municipalities across America, need to effectively use what's already in place, have a plan, and stick to it.

Without getting very scientific, I think it's pretty safe to say that in any given state at *least* two municipalities (large or small, it doesn't really make a difference) have probably spent far too much on their communications system, and for some reason it has failed once or twice during the past year. We know it failed miserably in New York City on 9/11, and from what I understand it's *still* not up to par! Very simply that's a conservative figure of about 100 (chances are there are many more!) communities across America that have been left unprotected. It's also a sure bet that at least half of those comms failures are repeat offenders! Given the staggering losses we've suffered at the hands of those who would do us harm, doesn't it get you angry that *we're* still prodding along as if nothing happened?

Now, I realize that as long as there are intricate systems depending on wire, electricity, coax, and computers there will always be glitches. But sadly, nearly four years after 9/11, glitches in our *attitude*, and our almost instinctive knee-jerk reaction to supersize the blame game by *spending* more and usually getting less, must change.

As radio monitors and communicators—CBers, hams, GMRS operators alike—we've found that in an emergency those with a tested plan survive to see the next day. Politicians take note, please. But if we continue to accept the party line—buying into, sometimes literally, more and more expensive tools (that come with a price tag for our grandchildren, as the deficit grows out of control), and growing additional bureaucracies to do the job of protecting The Homeland, we might as well fold our picnic tables, go home, and gaze at the TV, nodding mindlessly in agreement.

Yes, Rep. Hastert, it's hard to reform, but the further down the road we travel, the more difficult it becomes to see where we've been and the more distant 9/11/2001 becomes in that rearview mirror. In the meantime, those that would do us harm are watching, waiting, and planning because we're so darned predictable. ■

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, SSB-596, Editor, Popular Communications, *25 Newbridge Road, Hicksville, NY 11801-2909, or send e-mail via the Internet to popularcom@aol.com.*

The Fax Emperor Has No Clothes!

Dear Editor:

I recently received my MSN Hotmail upgrade to 250 MB of storage space with the ability to send messages up to 10 MB! The race to expand the capacity of the e-mail inbox that Google started last spring is truly a significant industry milestone! Sending and receiving large files will be easy as we will no longer have to worry about overloaded inboxes on the return from a holiday or long weekend.

Expanded e-mail storage space will reduce the necessity for the already arcane fax machines. If people need to send and share paper documents, they can simply scan them with a scanner and attach the file to an e-mail message. Multiple pages of scanned documents can range in size from 2 to 8 MB, which make them too large for most personal e-mail accounts. With expanded storage this is not a problem, and ultimately, there is nothing that a fax machine can do that cannot be done with an e-mail account and a scanner. The fax emperor has no clothes!

It seems to me that all of my friends under 30 abhor sending a fax message, while the older workers are more comfortable using it. Of course, the death of the fax machine has been prophesized before, and it may yet take a generational turnover to really put them away with floppy disks and pagers. The whole process of sending a fax is inefficient, uneconomical, and now with expanded storage, impractical. Expanded e-mail storage has taken away fax enthusiasts last excuse, and now we can all recognize that fax machines are officially obsolete. Happy scanning (flatbed, that is)!

Richard Zielinski
Washington, D.C.

Still An Untidy Period

Dear Editor:

I read your "Tuning In" about our fighting soldiers not having the radios they need, but I haven't read or heard anything about this anywhere else. I suspect that it's something many people don't want to acknowledge exists. While I agree that in the 21st Century it's inexcusable for any of our troops to be ill-equipped, it's my opinion that the problem isn't widespread. I do think, however, that far too many Americans are willing to accept and believe everything the TV media tells them—and they aren't doing as good a job as you are in telling it like it is.

Thank you for a great magazine and being a Patriot...and for helping people realize that our radio hobby is more than QSL cards, contesting, and listening to soccer games. What the rest of the world thinks and says about us is, or should be, important to—as you've said—"thinking" Americans.

Christian Adams
Savannah, Georgia

Zonked

Dear Editor:

Oh boy, you did it again; zonked another company big (Bill Moroney of the UPLC) as you call them right in the shorts. Your September "Tuning In" editorial was beautiful! What's good for the radio hobby—and even people who don't play radio—is that you. Keep on 'em. I usually figure if you're letting them have it, they probably deserve it!

Paul Williams
Philadelphia, PA

Track What?

Dear Editor:

I was reading your recent editorial called "Track This" about the problem with your TracFone. I don't know who your phone carrier is, as I live in Texas (I don't know who mine is), but my TracFone works quite well for me. Yes, the tech support can be a problem for all of us. The model phone I have is a Nokia 5125 that's digital/analog, has voice mail, caller ID (phone number only), and other nice features; the one I had before was a Nokia 252C for analog use only and I did not like it at all.

George E. Speck
Fort Worth, TX

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POPULAR COMMUNICATIONS

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

News, Trends, And Short Takes

AWR's English Language Service Moves To Regional Model

Adventist World Radio's English language service will be converted from a centralized global service to a local regionalized service beginning this month. The production of English programs currently takes place at AWR's Europe office in England. Under the new plan, local studios—primarily in Africa and Asia/Pacific—will produce their own English programs in areas where there is a satisfactory level of listener interest. This change is consistent with the rest of AWR's operations, where programs in all other languages are produced locally.

"AWR is primarily supported by the members of the Seventh-day Adventist Church, and giving has continued to increase year by year," said AWR president Ben Schoun. "However, many organizations need to sharpen their focus from time to time in relation to their core business. This move is a result of a re-examination of AWR's priorities. It will make us be more consistent with our mission, which is to reach people groups in their own languages. In examining our need/cost ratio, we realized that regional studios are capable of producing English programs where needed and can do it quite economically. It is our goal to add broadcasts for our areas of highest need, in languages such as Arabic and Turkish. As well, we feel that our English programs will contain more cultural flavor and meaning when created by local producers."

Some experts indicate that the growth of English as the global language may be slowing, while other major languages are becoming more widely used. Other global broadcasters, such as the BBC and Voice of America, moved to a regionalized model some years ago. This regionalizing trend also takes into account the fact that English usage and pronunciation are different in various areas of the world. AWR's English language service in England was phased out at the end of 2004, and resources have shifted to a broader base of broadcast needs. AWR's Africa region already airs a substantial number of locally produced English programs, and this service will be enhanced in 2005. New services will also be developed in the Asia/Pacific region. Beginning this month, listeners will be invited to write to their local studio at the address given on the broadcast, instead of the central listener mail address in London, England.

Said Schoun, "While local studios have produced English programs in the past, AWR decided to add a global service in 1993. During this time, our staff has done an outstanding job producing some favorite programs, such as Network 7 News, Wavescan, and Bible Answers. We appreciate the dedication and leadership that our English producers have demonstrated and the excellent contributions from our international correspondents around the world." "Wavescan," the English program produced for shortwave radio hobbyists, will be shifted to a studio location in the Asia/Pacific region, where the largest DX communities are found. The international DX program will continue with the participation of AWR's DX editor, Dr. Adrian Peterson. Contributions from large radio listener clubs in Japan, India, Bangladesh, and other locations will be added to the regular content.

Pop'Comm readers might still be able to hear the final edition of "Wavescan" produced in England, which will be aired at all usual times and frequencies on Sunday, December 26, 2004. The first program produced in Asia will be broadcast on Sunday, January 2, 2005. Listeners sending reception reports and requesting QSL cards will be invited to write to the new address. "Wavescan" will now be broadcast from AWR's station KSDA on the island of Guam; the specific schedule will be announced in advance.

NOAA's National Weather Service And Space Weather To Merge

The principal U.S. government agency for providing the public and industry with space weather data, information, and forecasts, The National Oceanic and Atmospheric Administration's Space Environment Center (SEC) was set to change its reporting structure when Congress approved the fiscal year 2005 budget. Activities of the SEC, along with its proposed budget, will move from under NOAA's research budget and administration to that of the National Weather Service (NWS), also administered by NOAA.

According to the report written by Louis Lanzerotti in the SEC User Notes: "The move, however is more than a mere change in the wiring diagram for NOAA's administration. It would appear that NOAA is becoming more serious in recognizing and appreciating the essential responsibility that it, through the SEC, holds for supporting the nation's space environment needs."

APCO Expresses Concern Over FCC VoIP Actions

The Association of Public-Safety Communications Officials (APCO) International today expressed its concerns with the FCC action to preempt states from regulating Voice over Internet Protocol (VoIP) service. The decision, which was sparked by a petition from Vonage Holdings Corp. seeking federal preemption on its product DigitalVoice, stated that Internet telephony service and other IP-enabled services are not subject to traditional public utility regulations.

On November 2, APCO International sent a letter to the FCC stating its concerns with the upcoming decision. The letter expressed the need for states to retain the authority to impose 9-1-1 surcharges on all telephone services that provide access to 9-1-1. In addition, APCO International stated that state regulations requiring that VoIP providers offer E9-1-1 capability should not be preempted.

"While effective national regulation to ensure VoIP/E9-1-1 capability may be preferable to inconsistent state regulation, states should not be prevented from taking innovative steps to protect their citizens in the absence of federal action," the letter from APCO International President Greg Ballentine said. "Rather than preempt states, the Commission should use this opportunity to take the lead and adopt meaningful rules to ensure that all interconnected VoIP services provide full E9-1-1 capability."

"The FCC's decision does not protect public safety's concerns that the quality of E9-1-1 service be maintained," Ballentine said, continuing, "APCO International applauds the Commissioners for recognizing 9-1-1 as an important issue

(Continued on page 56)

Catching The Red Orchestra

How The Nazis Found Resistance And Spy Transmitters

By R.B. Sturtevant, KD7KTS

Every month in "Shannon's Broadcast Classics," she takes us back to radio's golden years here in North America. Now, as a special for you this month, I ask you to go back in time with me—more than 63 years to 1941.

—rbs

It was Thursday, June 26, 1941. Four days earlier, Hitler's full fury had been unleashed on the Russians in the form of three million troops invading the Soviet Union. At a long-range radio monitoring station in Kranz on the Baltic coast of East Prussia, the intercept operators were busy sweeping the airwaves for unauthorized signals. They were the Reich's first-line of defense against those who sought to communicate with forces hostile to Nazi power.

At 3:15 a.m., a signal was picked up on a frequency normally used by the Norwegian Resistance in nightly contacts with London. But the radio procedures were different from those the Norwegians used. "KLK from PTX...KLK from PTX...KLK from PTX 2606.03.03032 WDS. No.14 QBV." This message was followed by 32 five-figure groups that could only be an enemy cipher. The Morse signature to this message was "AR 503.85. KLK from PTX." This also was not the Norwegians, who only sent 10 or a dozen groups. It was too long a message and the procedures indicated a previously unknown group. Over the next four nights, the Kranz station intercepted four more messages from PTX to KLK. Directional bearings taken on the transmitters revealed that KLK was probably not inside Hitler's Europe but that PTX definitely was. Signal Security of German Military Intelligence wanted to talk to this new "pianist." ("Pianist," or "musician," was the term Counter Intelligence used for radio operators, just as "cobbler" was used for a forger.)

The Kranz station had taken a directional bearing on the new "music box," or transmitter, and reported it to Signal Security headquarters in Berlin. Immediately, other long-range intercept stations were alerted to be on the lookout for PTX at 10.363 kilocycles. They would triangulate the location of PTX, and a very high priority was set on getting those bearings. Since the transmissions had started just after the beginning of Hitler's attack on Russia, it didn't take a genius to figure that KLK might be in Moscow.

The Elusive Transmitter—The Tip Of The Iceberg!

During the next two months, PTX tapped out on the Morse key about 250 messages to KLK. But Counterintelligence found

This Nazi propaganda poster, released in 1940 says, "Smash the enemies of greater Germany." (Dr. Robert D. Brooks at the German Federal Archives in Koblenz)

their efforts to get bearings on the elusive transmitter were inconclusive. The only thing they were sure of was that PTX was somewhere in the area of southern Holland, Belgium, or northeast France, but an imprecise interception bearing report was worse than no report at all. They did, however, find that there was another pianist working on the same frequencies and using the same five-number code groups as well as the same on-air procedures as PTX. This meant they were probably in the same spy organization. Because the group was thought to

be working for Moscow, and there were multiple musicians, they were dubbed "The Red Orchestra."

What Signal Security of German Military Intelligence had really discovered was only the tip of the proverbial iceberg. PTX and his brother musicians, as well as all the agents supporting them, were finding out the secrets of Hitler's Third Reich. Their spying and transmissions to Soviet Military Intelligence was to become the most successful spy ring operating in World War II Europe. It would take the Germans more than two years to break up the ring, many of whose operatives would still be at large on VE Day.

Attempts to locate the second pianist were more productive, and far more alarming. They were coming from within *five* miles of Signal Security Headquarters in Berlin! Shortly after the signals from the Berlin musician were picked up, the transmitter went dead. Correspondingly PTX's traffic volume increased; more proof that the two were working together.

1941 Direction Finding, Less Than An Exact Science

The strongest and longest signals were coming from somewhere in the area around Brussels. Radio direction finding (DF) was less than an exact science in 1941. The solution to the problem was to put more DF equipment into the Brussels area and continue to close in on PTX, so three DF trucks were sent to Brussels. The plan was to drive around during the times the pianist was supposed to be operating his music box tuned to the frequency thought to be in use. When a signal was picked up, a compass bearing was taken. The team in the truck would then call in the truck's location and the signal's bearing. Complicated systems like this rarely work well the first time out, but this time they got lucky. Each truck got a good fix on PTX on the first try. The only problem was that when the trucks' locations were plotted on a map and the bearings from the trucks to the transmitter were drawn, none of the lines crossed. The trucks and their equipment were fresh from the factory. Nobody had calibrated the equipment before putting it to use.

PTX was no beginner. The operator would make contact with KLK on one frequency using one callsign, then a change of frequency was made and another callsign was used to pass traffic. A third change of frequency and callsigns was made to receive incoming traffic from KLK. Every month the operator and his control would use a different set of callsigns and frequencies for each of the 30 days of the month. It would take interceptors a great deal of time to work out the system being used and then, in the next month, everything would change again. Breaking into the system required patience.

It took a lot of truck miles and people walking the streets with suitcase-size DF systems to finally get an accurate fix on PTX. Several of the trucks and walkers were picked up by other police organizations, which wondered why people were wandering around at night in a seemingly aimless manner. This was especially apt to happen to DF units working near military barracks or administration headquarters. Finally, Signal Security had a fix on PTX—in fact, it had three of them. PTX had taken the added precaution of having three transmitters working from three widely separated locations. One operator would transmit information then suddenly stop. Another operator would pick up the transmission, making it appear that there was no break, or that the same music box was still singing its tune. The change would be made again and again until everyone had finished his or her part of the concert. This way raiding one transmitter would not put the ring out of business and the operators not picked up could simply go into hiding to avoid capture.

Dismantled, But Too Late

Signal Security only had enough people to make one raid effectively. They decided they would raid the transmitter that seemed to start things out every night. On June 29, 1942, the night chosen for the raid, Signal Security and Military Secret Police swooped down on PTX shortly after it went on the air at 3 a.m. The pianist made a short run for freedom but was captured.

After being turned over to the tender mercies of the Gestapo and their "intensive interrogations," the pianist revealed the names of the Berlin spy ring whose traffic he had been handling, as well as many of the names of the ring's Brussels members.

For the next two years, Signal Security would use the same techniques, aided by the Gestapo interrogators, to round up Red Orchestra in Belgium, Holland, and France. By the end of the war, 600 people were arrested. After secret trials, 58 of them would be executed, including Mildred Harnack, the only American woman executed by Hitler. Many others died avoiding capture or in concentration camps; some of them were forced to transmit for the Germans.

Their information came from sources in all the major ministries in the German Government, and included a phone tap on the headquarters of Military Intelligence in Paris. The importance of the information the Red Orchestra sent to Moscow cannot be overstated. It was decisive in Soviet military planning and Hitler's defeat in the east, as was demonstrated by a German commander who overran a Russian position and found a copy of his orders from Berlin on the Soviet commander's desk! ■

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Palo Alto, California

Personal Locator Beacon Update

These High-Tech Lifesavers Are Great— If You Know Their Limitations And How To Use Them Correctly!

by Gordon West, WB6NOA

It's been over a year and a half since the traditional Emergency Position Indicating Radio Beacon (EPIRB) and Emergency Locator Transmitter (ELT) services have been specifically allowed for land use. The term PLB, for Personal Locator Beacon, refers to those FCC-authorized 406-MHz beacons that are specifically permitted for use on land and inland lakes and rivers of the United States.

The 406-MHz coded signal is received both by geostationary satellites, called GEOSAR, and polar-orbiting satellites, part of the COSPAS/SARSAT satellite system. Each PLB is pre-programmed with its own unique code. The buyer of a new 406-MHz PLB registers his or her equipment with NOAA, so if ever a distress alert is received with that specific code, NOAA has some background on who the owner is, as well as a phone number to check if the owner is indeed signaling for help out in the wild, as opposed to a false activation (see box at end for registration phone numbers). Using the 406-MHz Doppler shift technique, satellites take a precise fix on the origin of the signal. The data is then stored, not just relayed. When the satellite passes over the next available ground monitoring station, called a Local User Terminal (LUT), the information is downloaded.

If the PLB also has a built-in GPS, or is tied into a GPS, the LUT will also see its specific position on land. The LUT forwards all the data to a Mission Control Center where it's verified that the signal is from an actual emergency. For land rescues, Civil Air Patrol and local search and rescue agencies are then contacted.

Over 100 "Saves"

There have been over a hundred "saves" within the last year and a half, thanks to PLBs. The very first save was a dramatic rescue of a sailboat crew at sea, off the coast of North Carolina. Another save was the rescue of two passengers after an emergency landing of a small helicopter in the mountains north of Seattle, Washington. Yet another save was a snowmobile operator who went through ice but finally scrambled to shore, without any way to signal for help except for his wet PLB. It worked! And another rescue was an off-road enthusiast who rolled his vehicle and was at the bottom of a sand dune without any cellphone coverage.

Oops! False Alerts, Too

But the PLBs have also contributed to some most-amazing false alerts. The Air Force Rescue Coordinator Center had a distress alert fix in the Death Valley area of Inyo County, California. A few minutes later, the signal was coming 47 miles east in the state of Nevada. After a few more minutes, it was nine miles west, back in California. Finally, the signal settled down to the Bureau of Land Management in Death Valley National Park, and it was finally traced to a retired USAF pilot who was quite well and sipping a cool beverage at a camp site. His brand new PLB was so new it had not even been taken out of the packaging, yet it was transmitting. Although the flip switch was indeed in the OFF position, it somehow magically got turned on. How? In the same shopping bag from the sporting goods store the "victim" had patronized was one of those new no-battery flashlights that you shake to charge up a capacitor to illuminate the LED. A big magnet passes through the coils to develop electricity. The big magnet, held close to the PLB, tripped the PLB magnetic switch, and the unit went into emergency transmit. Lesson learned? KEEP ANY MAGNETS AWAY FROM AN EMERGENCY POSITION INDICATING RADIO BEACON!

Older EPRIBS were far too large for portable operation, nor were they approved for land use.

High-Tech!

Some emergency PLBs give you the capability to take the output datastream of your favorite GPS and input it to the PLB. You can run it continuously, or fix your position before a big hike. It was initially thought to be a big improvement to add GPS to the inside of the PLB, allowing you to *always* have the

A PLP, such as this one, transmits on 121.5 MHz and data bursts on 406.028 MHz.

A rescue team member tracking an activated PLB in the snow.

capability of sending a 406-MHz emergency signal that would include your current GPS position. But, as we all know, receiving GPS signals requires your GPS set to be held up and away from your body. There were also problems of receiving a good GPS fix when under a canopy of trees.

While this is not news to most avid outdoorsmen who regularly hike with GPS, PLB manufacturers with the built-in GPS just figured anyone injured who had a PLB would naturally pull the unit off their belt and hold it with a clear view of the sky. Maybe. But most recently the popular McMurdo PLB with built-in GPS was dealt a healthy amount of bad publicity because of field tests showing a GPS datastream seldom riding along with the 406-MHz data packet. The publicity got *so* intense that McMurdo issued an advisory notice on their McMurdo Fastfind Plus 406-MHz Personal Locator Beacon. While this wasn't an official recall, McMurdo wants to talk with everyone who owns one of these new beacons (if that includes you, you can call them directly at 800-783-0889). All the while, their competition, ACR, was well aware of how PLBs are worn on the belt, and the company encouraged the use of an *external* handheld GPS source when used with its ACR Gypsi 406 Personal Locator Beacon. ACR now announces a 406 GPS Personal Locator Beacon with both an internal GPS, as well as external GPS capabilities.

These two manufacturers are quickly learning about the fast-changing techniques of GPS position acquisition. No doubt many of you have your own GPS equipment, and by watching the display and the signal strengths of satellites being tracked, you can easily see how "agile" your equipment is on its first turn-on fix. I have a Garmin as well as a Magellan, and they typically come up in about 30 seconds—sometimes longer, but seldom in less time.

In last month's *Popular Communications*, I talked about the new GPS dashboard mapping unit from C-Map, called AvMap, and the GPS engine inside its hockey puck magnetic antenna typically gives me a position fix *within seconds* of turn-on from a warm start. *All* GPS equipment will stumble for several minutes on a cold start, because it needs to acquire a lot of satellite information when it hasn't been turned on for several days. But the AvMap on a warm start is on and navigating nearly instantly, thanks to a more robust 12-channel GPS engine, housed in the antenna unit for minimal signal loss.

Sealing a GPS chip set inside a marine EPIRB or PLB was no simple task for McMurdo and ACR. Anything bobbing in the water, or any type of GPS receiver strapped inside a PLB you wear on your belt, may be hard-pressed to always see enough satellites for a good GPS "catch." No doubt this was the problem encountered during a series of on-the-water tests, one conducted by the U.S. Coast Guard in Miami and the most recent test conducted independently off of Santa Cruz, California. The testing has revealed that the GPS *reception* is the key issue, *not* the uplink to the satellites. And no doubt McMurdo, well-respected in the lifesaving field, will figure out a better way to quickly get a GPS signal package and then get it sent up to the satellites as fast as ACR is doing it.

Your Responsibility, Too

What can you do to help yourself? Make sure *your* EPIRB has a fresh set of batteries. Double-check that the equipment won't go down with the ship, trapped below. Check with your U.S. Coast Guard Auxiliary unit and see when they will next have an EPIRB testing station.

And if you are uploading a GPS position to your onboard EPIRB, make sure that your onboard GPS is indeed turned on and that the data is flowing to that EPIRB. One small EPIRB can be a lifesaver, so double-check that it's operating properly. ■

EPIRB Registration Info

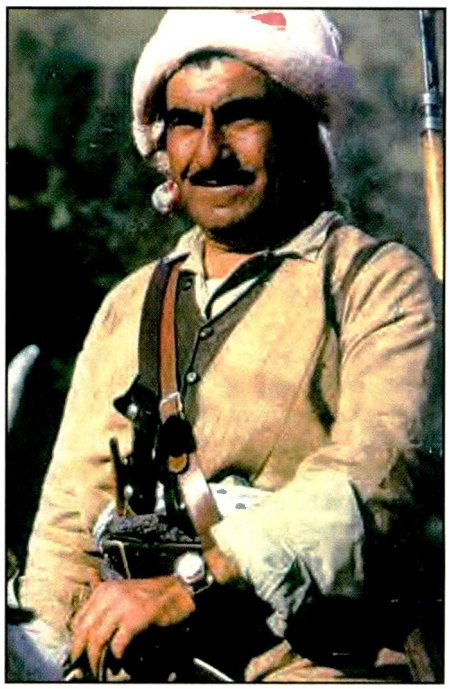
Phone: 888-212-SAVE
Canadian Registration, Phone: 800-432-0227

Kurdish Waves

Listening to A Middle East People Who Want A Nation Of Their Own... And, You Guessed It: Oil!

by Gerry Dexter

The Kurds are spread throughout several Middle East countries.



Masoud Barzani's Kurdish Democratic Party operates the Voice of Iraqi Kurdistan.

They've been called history's losers, a people whose only friends are the mountains of their homeland. Technically, though, they have no homeland, no genuine country they can call their own, despite centuries of effort. Years and years of making war, making peace, and agitating have failed to bring nationhood to the fourth largest ethnic group in the Middle East.

The Kurds—25 to 30 million of them—are spread throughout an area of the Middle East known as Kurdistan, which on a map looks like some sort of geographical Rorschach blot inked over parts of Iran, Iraq, Turkey, Syria, and Armenia.

The Kurds are not Arabs. They are not Turks. Nor are they Persian. They don't speak Arabic or Turkish or Farsi. In fact, not all of them even speak Kurdish. The Kurds have a unique identity of their own, which has proved both a blessing and a curse. Their separateness makes governments with Kurdish populations nervous, because political leaders are wary of the Kurds' ancient desire for a nation of their own. Even though many Kurds have pretty much given up on the idea, there's always a chance that some latter day Saladin (who was Kurdish) will come along and rev things up again. Even if that never happens, nations with significant Kurdish populations are uneasy at having an ethnic group that doesn't want to be absorbed into some other national culture.

Over the last several hundred years, the Arabs, Turks, Mongols, and the Safayid and Ottoman Empires (the latter around the time of World War I) have conquered the Kurds. One of the outcomes of the realignment, which followed the first world conflict, was a provision for a Kurdish state. But that treaty was short lived; it was superseded three years later by another treaty, which left the Kurds out in the cold. And then the fun started.

The Revolts Begin!

Almost immediately after that second treaty, Turkey had to put down Kurdish revolts (in 1925 and again in 1930). Another revolt in the late 1930s also failed. A few years after that one was put down, the Kurds rose up again, and were defeated yet again. The Iranian Kurds also rebelled unsuccessfully in the 1920s. In the 1960s, Iraqi Kurds fought against the still-new Baathist regime there, eventually gaining a promise of self-rule. However, the Kurds felt the offer wasn't good enough and rejected it. Fighting broke out once more when Baghdad tried to impose its own idea of autonomy on its Kurdish area, and that conflict continued throughout the bloody Iran-Iraq War of the 1980s.

After the Gulf War in 1991, Saddam Hussein's forces put down still another uprising. But the next year, with Allied backing, the Iraqi Kurds managed to set up the Kurdish autonomous region, which exists in Northern Iraq today.

Turkey, where Kurds make up more than 20 percent of the population, hasn't been amenable to Kurdish hopes, either. In fact, the Turkish government has long been on a campaign to quash Kurdish culture, even to the point of banning the use of Kurdish names and language. From the mid-'80s, Turkish Kurds have waged an on-and-off guerrilla war against Ankara. Turkish treatment of the Kurds has improved in recent years, thanks to reforms Turkey had to make as part of its quest to be admitted to the European Union.

The Kurds in Iran haven't gone to revolutionary lengths, although they haven't been completely quiet, either. The Kurds did manage a brief period free of Tehran's control during the turmoil and madness of Ayatollah Khomeini's revolution in 1979, but in the long run were unable to hold on.

Nooo, Not Oil!

All along, there have been elements in the Kurdish "group personality" that have worked against the idea of an autonomous Kurdish nation. For one, the Kurds are a tribal people and the tribal leader is likely to demand full loyalty from his own people, rather than let it go to some vague idea of a Kurdish people or nation. Yet any Kurdish nation which might one day come into being would have one big thing going for it: oil! If they could get the borders drawn in their favor (that they could not was the main reason the Iraqi Kurds rejected Baghdad's autonomy deal in the 1970s), they would have access to a lot of underground wealth.

With so much history, so much suffering, and so many differences, it isn't at all surprising that there are a number of Kurdish political parties, each one jockeying for power and position—an activity which has sometimes involved (literally) gunning for each other. Nor should it be surprising that at least some of these parties feel a need to get their message out. The same holds true for the propaganda machines of some of the governments in the area and certain other groups and organizations that have their own cards to play. All of which means it's time to head for the radio!

Airing Grievances

Many of the stations discussed below are extremely hard to pick up; the time and frequency pairings are chosen to provide best reception in the target area, which is certainly amenable to reception in North America. You'll have better results hearing the limited activity on the higher frequencies. When you get right down to it, information about these stations is frequently nebulous, sketchy, and subject to constant, unannounced change. If you go hunting for them, don't count on rock solid frequencies or precise timings; both the schedules and frequencies seem to dance around as though the stations really did not want to be heard. Few, if any, appear to be targets of jamming, so the reasons for such instability may be more a case of

The Voice of the People of Kurdistan operates from Sulaymani.

inadequate equipment and a casual approach to such things as sign off and sign on times. I should also point out that those stations that were backed by Saddam's government are very likely silent now. They're included in our summary anyway because their status isn't fully clear—it's possible some may have found new backers.

So, if you're up to the challenge, see what you can do with the following:

The Voice of Iranian Kurdistan (Seda-ye Kordestan-e Iran) is aimed at the Kurdish population within Iran and broadcasts in Kurdish and Farsi on variable **3975** from 0230 to 0430 and again at 1330 to 1530. It has also been reported using **5860**. It's the mouthpiece for the Democratic Party of Iranian Kurdistan (PDK), with an address of: PDKI, c/o A.F.K., Boite Postal 102, F-75623 Paris, Cedex 13, France. Or, you can also try POB 29010, London, Ontario N6K 4L9, Canada.

The Voice of the People of Kurdistan (a.k.a. Voice of the Kurdistan People) is run by the Patriotic Union of Kurdistan (PUK) and was formerly known as the Voice of the Iraqi Revolution. It broadcasts in Kurdish and Arabic on **4025** (and perhaps **4417**) from 0200 to 0500 and 1225 UTC to as late as 2100. You might also try them on **6995** where they sometimes show up during our evenings. The station transmits from Sulaymaniyah in Kurdish-controlled northern Iraq. It can be reached at: Postfach 21 0231, D-10502, Berlin, Germany. E-mail: pukoffice@pukg.de.

The Voice of Iraqi Kurdistan is the station of the Kurdish Democratic Party (KDP) and has some sort of affiliation with the National Democratic Iraqi Front, headed by Masoud Barzani. Its broadcasts come from Salah al-din within Kurdish-controlled Northern Iraq. It uses **4085** (often varying to **4090** or higher) from about 0345 to 0600 and 1445 to 1830 in Arabic

and Kurdish. It's reported to have a brief English segment around 2020. For an address, try the KDP International Relations Committee, P.O. Box 7725, London SWIV 3ZD, England. E-mail: kdpeurope@aol.com. There is a U.S. office at 1015 18th St. NW, Suite 704, Washington D.C., 20036.

Oddly, the KDP's website shows its station as the **Radio Voice of Kurdistan**, claiming to have been the first Kurdish radio station, established during the 1963 revolution against Iraq. It used military radio transmitters, housed in a cave north of Erbil and was targeted by the Iraqi Air Force on a number of occasions. KDP says the station is on the air from 1900 to 2130 on **4075**. To my knowledge, this one has never been reported under that name, nor can I find it in any of the frequency lists.

Voice of Independent Kurdistan is an operation of the Kurdistan Workers Party (PKK), but with a Turkish tinge to it. It's supposedly operational in Kurdish and Turkish using **4160** or **4195** between 0400 and 0530 and 1445 and 1600. **6215** is another possible frequency. The PKK supposedly changed its name a couple of years ago (to the Congress for Freedom and Democracy in Kurdistan) and claims also to have given up on the idea of a separate Kurdish state within Turkey.

Information is also hazy on **Radio Kurdistan**. This one is supposedly active on **4140** between 0340 and 0600 and again from 1600 to 1700 in both Kurdish and Arabic. It's operated by the Kurdistan Socialist Democratic Party.

Voice of the Kurdistan Toilers is run by the Kurdistan Toilers Party and operates on **4245** from 0200 to 0430 and 1330 to 1800 in both Kurdish and Arabic. E-mail to: info@ktpu.nu.

The Voice of Komala (Seda-e Komalah) is the yakker for the Kurdish division of the Communist Party of Iran. It broadcasts in Kurdish and Farsi on **3930** and **4620** from 0230 to 0800 plus 1600 to 1700, and on **3930** and **4610** from 1700 to 1830. It is also reported to be relayed by Norway's Sveio transmitter on **7560** between 1700 and 1757.This one can be reached at P.O. Box 750 26, Uppsla, Sweden or e-mailed at: komalah @cpiran.org.

Radio Komala broadcasts the views of the Revolutionary Organization of the People of Kurdistan and runs from 1700 to 1830 in Kurdish and Farsi on **3930** and **4610**.

Harim Radio is the voice of the regional government of Iraqi Kurdistan and, as such, it should be active, but as of this writing that seems not to be the case. It is based at Sala al Din in the Kurdish territory of Iraq and uses **4085**.

The Voice of Mesopotamia (Denge Mesopotamia) is probably the easiest of the Kurdish-related stations for most of us to hear. It speaks on behalf of the Kurdistan Workers Party (PKK) and uses **11530** (via a 100-kW Moldavian government transmitter) from 1300 to 1700. Reports go to TDP, P.O. Box 1, 2310 Rijkevorsel, Belgium, with hopes that TDP will forward.

Radio Freedom—Voice of the Communist Party of Iraqi Kurdistan (a.k.a. Radio Azadi) reportedly is active in Kurdish and Arabic. There are at least two others that have been active, although very little known about them. They are **The Voice of the Conservative People of Kurdistan**, in Kurdish and Arabic on **4167** between 0300 and 0400, and the **Voice of the Mujahedin of Iranian Kurdistan**, which reportedly uses a frequency between **4260** and **4290** from 0300 to 0400.

Altogether that's a better lineup than many actual countries can claim. Good luck in your efforts to hear at least one or two of them—and be sure to let me know what you're fortunate enough to catch! ■

by Laura Quarantiello, lauraq@cox.net

Capitol Hill And FCC Actions Affecting Communications

Canadians Get SAR Frequency

Canada's first responders and the volunteers who help them could soon have a designated radio frequency for disasters or search and rescue operations. Problems with radio communications have been a stumbling block for years whenever emergency response agencies have to work together. But the issue has received more attention in the wake of the 9/11 terrorist attacks.

Now, a Search and Rescue Interagency National frequency, known as SARIAN, is expected to be in place within months. As there are limited VHF channels available, Industry Canada is looking at sharing some of its own capability for SARIAN.

Marine Channel 71

The FCC has amended Section 80.373(f) of the Commission's Rules to make VHF marine Channel 71 (156.575 MHz) available for intership port operations communications in Puget Sound, the Straits of Juan de Fuca, and their approaches. This amendment will allow the vessel traffic in Puget Sound to be managed more efficiently and will protect the marine environment by preventing vessel collisions and groundings.

Back in March 2004, the U.S. Coast Guard submitted a request to the Bureau's Public Safety and Critical Infrastructure Division recommending that VHF marine Channel 71 be authorized for use by the Puget Sound Pilots for intership port operations communications at a normal power of 1 watt (exceptionally 10 watts) in Puget Sound, the Straits of Juan de Fuca, and the approaches. The FCC agreed with the Coast Guard that the proposed designation would enhance maritime safety as there was a critical need for an additional VHF channel for communications between large commercial vessels, tankers, and other vessels carrying hazardous cargoes, and pilots and tugs in the Vessel Traffic Service Puget Sound (VTS Puget Sound). The only frequency dedicated to intership communications related to port operations, VHF marine Channel 77 (156.875 MHz), is frequently congested, especially by the Canadian use of this channel for ship movement and docking at Delta Port, British Columbia, near the northern border of VTS Puget Sound.

Vehicle Signaling

Despite opposition, the companies developing emergency vehicle signaling services say they are moving forward with testing. Officials with Safety Cast Corp., Alert Devices International Corp., and AlertCast Communications LLC claim their devices would make roads safer by alerting motorists of approaching emergency vehicles. An Emergency Vehicle Signaling Service, or EVSS, involves the installation of low-power transmitters in public safety vehicles. The transmitter uses the AM and FM bands to transmit a warning directly to car radios that are already in use. Because of the "jamming technique" used by EVSS equipment, broadcast groups oppose the proposed service, claiming it would interfere with local stations and potentially override Emergency Alert System messages.

Only one company has a request before the FCC for Special Temporary Authority (STA) to test its system. Safety Cast applied for the STA in early 2003 to test its EVSS technology in Jacksonville, Florida. The FCC dismissed Safety Cast's application due to a problem with frequency choice. The company has asked the commission to review the decision and the application is still pending.

All three companies say their services will interrupt radio broadcasts and affect both mobile receivers and fixed radios in residences or businesses. "It's a power issue. Our system can attenuate power and adjust it as it moves to allow for lower power levels in dense residential areas," Katano added. ADiCorp has said power levels for its Radio Alert Transmitter would fluctuate between 15 and 45 milliwatts, depending on the speed of the emergency vehicle.

The Society of Broadcast Engineers and NAB filed comments on ADiCorp's Petition for Rulemaking this spring voicing concern with how EVSS works. Both groups believe the service would set a dangerous precedent and further damage spectrum integrity. The NAB noted in its comments on ADiCorp's petition that the FCC set aside 5.9 GHz for Dedicated Short-Range Communications in the Intelligent Transportation System in February and that authorizing another service for motor vehicle notification would be redundant. Not surprisingly, public safety agencies have voiced support for the new technology.

Wearable XM Radio

XM Satellite Radio has unveiled a wearable device in the form of a satellite-radio receiver with headphones that also offers a hard drive, enabling users to download XM content. The Delphi MyFi is billed as the first personal, portable XM2GO satellite radio that delivers XM's Ultimate PlayList of more than 130 digital XM channels in two ways: a "live" listening mode and a time-shifting "memory" mode. The MyFi's live mode enables users to listen live to all of XM's 68 commercial-free music channels, plus premier news, sports, talk, traffic, and weather channels. MyFi's memory mode, called "My XM," allows users to store five hours or more of XM's content with the press of a button, even when the unit is not in use. The unit retails for $349.99 and is available at major retailers everywhere. XM rival Sirius Satellite Radio has said it expects to roll out wearable products in late summer 2005.

GPS On GMRS Approved

Garmin International has been granted a two-year waiver allowing the company to manufacture and market GMRS transceivers capable of transmitting GPS location information on GMRS channels. There are several conditions that went along with the waiver: Garmin must design the units it proposes to manufacture such that the mobile units capable of transmitting text and GPS location data have integrated antennas, it must design the units such that transmission of text and GPS location data is limited to 462-MHz GMRS channels, as specified in Section 95.29(a) and (f); which channels are not repeater input frequencies, it must design the units such that transmission of text and GPS location data is limited to an authorized bandwidth of no more than 12.5 kHz, and it must design the units such that a unit cannot automatically (without manual action or command) poll other units to determine their location based on GPS-derived location information. ■

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

Reviewing Propagation And Space Weather Terms

On various Internet websites you will read—and during the hourly space weather and geophysical reports broadcast by the National Oceanic and Atmospheric Administration (NOAA) you will hear—terms and measurements that describe the various conditions and levels of solar activity and so on. For instance, NOAA uses the WWV and WWVH radio stations to issue geophysical alert messages that provide information about solar terrestrial conditions. Geophysical alerts are broadcast from WWV at 18 minutes after the hour and from WWVH at 45 minutes after the hour. You may also access these alerts on the Internet (see http://www.sec.noaa.gov/ftpdir/latest/wwv.txt) or by telephone. The messages are less than 45 seconds long and are updated every three hours (typically at 0000, 0300, 0600, 0900, 1200, 1500, 1800, and 2100 UTC). More frequent updates are made when necessary. WWV radiates 10,000 watts on 5, 10, and 15 MHz; and 2,500 watts on 2.5 and 20 MHz. WWVH radiates 10,000 watts on 5, 10, and 15 MHz, and 5,000 watts on 2.5 MHz. Each frequency is broadcast from a separate transmitter. Although each frequency carries the same information, multiple frequencies are used because the quality of HF reception depends on many factors, such as location, time of year, time of day, frequency being used, and atmospheric and ionospheric propagation conditions. The various frequencies make it likely that at least one frequency will be usable at all times. You can read the details about WWV and WWVH at http://www.boulder.nist.gov/timefreq/stations/wwv.html .

The geophysical alerts provide information about the current conditions for long-distance HF radio communications. The alerts use a standardized format and terminology that requires some explanation. Before looking at sample messages, let's look at some of that terminology.

Solar flux is a measurement of the intensity of 10.7-centimeter (roughly 2800-MHz) solar radio emissions. At 2000 UTC, the Dominion Radio Astrophysical Observatory of the Canadian National Research Council located at Penticton,

The Ap Index And Understanding Propagation Terminology

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

Classification of A-indices is as follows:

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

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

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

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

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

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

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

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

Optimum Working Frequencies (MHz) - For February 2005 - Flux = 83, SSN = 24- 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	20	18	15	12	11	11	10	10	10	9	9	9	9	9	15	18	20	21	22	22	22	22	22	21
NORTHERN SOUTH AMERICA	28	26	23	17	16	15	14	14	13	13	12	12	12	12	17	23	25	27	28	29	30	30	29	29
CENTRAL SOUTH AMERICA	27	25	22	16	15	14	14	13	13	13	12	12	12	12	19	24	26	27	28	28	29	29	29	29
SOUTHERN SOUTH AMERICA	29	28	25	21	18	17	16	15	14	14	13	13	13	12	12	22	25	26	28	28	29	30	30	30
WESTERN EUROPE	9	9	9	8	8	8	8	8	8	8	8	8	8	8	11	14	15	16	15	15	13	10	10	9
EASTERN EUROPE	8	8	8	8	8	8	8	9	9	8	8	8	8	8	8	10	10	10	10	9	8	8	8	8
EASTERN NORTH AMERICA	22	20	17	13	12	12	11	11	11	10	10	10	10	10	17	20	22	23	24	24	24	24	24	23
CENTRAL NORTH AMERICA	13	12	11	9	7	7	6	6	6	6	6	6	6	5	5	10	11	12	13	13	13	13	13	13
WESTERN NORTH AMERICA	7	6	6	5	4	3	3	3	3	3	3	3	3	3	3	3	5	6	6	7	7	7	7	7
SOUTHERN NORTH AMERICA	21	20	18	14	12	11	11	10	10	10	9	9	9	9	9	17	19	21	22	22	23	23	23	22
NORTHERN AFRICA	9	9	9	9	8	8	8	9	9	8	8	8	8	8	12	15	16	17	17	16	11	10	10	10
CENTRAL AFRICA	11	11	11	10	10	9	9	9	9	8	8	8	8	8	12	14	16	17	17	15	14	13	12	12
SOUTH AFRICA	20	18	14	12	12	11	11	10	10	10	10	10	10	10	17	19	21	22	22	23	23	23	22	21
MIDDLE EAST	9	8	8	8	8	9	9	9	9	8	8	8	8	8	8	13	15	15	11	10	10	9	9	9
JAPAN	19	18	18	17	16	14	10	10	10	9	9	9	9	8	8	8	8	8	8	8	8	14	16	18
CENTRAL ASIA	19	18	18	17	16	14	10	10	10	9	9	9	9	8	8	8	8	11	11	10	10	10	14	19
INDIA	14	15	15	13	11	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	9	12	13
THAILAND	18	18	17	17	15	13	10	10	9	9	9	9	8	8	8	8	8	12	12	12	11	11	11	10
AUSTRALIA	24	25	27	27	25	21	16	15	14	14	13	13	12	12	12	12	12	16	15	14	15	18	20	22
CHINA	16	17	17	16	15	13	10	10	9	9	9	9	8	8	8	8	8	9	9	8	8	8	8	14

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
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NORTHERN SOUTH AMERICA	25	23	19	18	16	15	14	14	13	12	12	12	11	15	19	22	24	25	26	27	28	28	27	26
CENTRAL SOUTH AMERICA	26	23	19	18	17	16	15	14	14	13	13	12	12	20	23	24	26	27	28	29	29	29	29	28
SOUTHERN SOUTH AMERICA	28	26	23	21	19	18	16	16	15	14	14	13	13	14	21	24	25	27	28	29	29	30	30	30
WESTERN EUROPE	9	9	9	8	8	8	8	8	8	8	8	8	8	14	16	17	17	17	16	16	14	12	10	9
EASTERN EUROPE	8	8	8	8	8	8	8	8	8	8	8	8	8	12	14	14	13	13	12	12	10	9	9	9
EASTERN NORTH AMERICA	15	13	10	9	9	8	8	8	8	7	7	7	7	11	14	16	17	17	18	18	18	18	17	16
CENTRAL NORTH AMERICA	7	7	6	4	4	4	4	3	3	3	3	3	3	3	5	7	7	8	8	8	8	8	8	8
WESTERN NORTH AMERICA	13	12	11	9	7	7	6	6	6	6	6	6	6	6	5	10	11	12	13	13	14	14	14	13
SOUTHERN NORTH AMERICA	15	13	11	9	8	8	7	7	7	7	7	7	6	6	11	13	15	15	16	16	16	16	16	15
NORTHERN AFRICA	11	11	10	10	9	9	9	9	8	8	8	8	10	15	17	18	18	19	19	19	16	13	12	12
CENTRAL AFRICA	12	11	10	10	9	9	9	9	8	8	8	8	10	15	17	18	18	19	19	17	15	14	13	13
SOUTH AFRICA	20	16	15	14	14	13	13	13	12	12	12	12	16	23	26	27	29	29	29	29	29	27	24	22
MIDDLE EAST	9	9	8	8	8	8	9	9	8	8	8	8	8	14	16	17	18	16	13	11	10	10	9	9
JAPAN	18	17	16	14	10	10	10	9	9	9	9	8	8	8	8	9	9	8	8	8	8	13	16	17
CENTRAL ASIA	18	17	16	14	10	10	9	9	9	9	9	8	8	8	8	10	11	11	11	10	10	10	11	18
INDIA	11	13	12	10	9	9	9	9	8	8	8	8	8	8	12	14	13	12	9	9	9	9	8	8
THAILAND	17	16	15	13	10	10	9	9	9	9	8	8	8	8	8	12	13	12	12	11	11	11	11	10
AUSTRALIA	24	26	26	23	17	15	14	14	13	13	13	12	12	12	12	14	17	16	15	14	16	19	21	23
CHINA	15	16	15	13	10	10	9	9	9	9	8	8	8	8	8	9	9	9	9	8	8	8	8	12
SOUTH PACIFIC	28	28	26	23	19	17	16	15	15	14	13	13	13	12	12	17	16	15	17	20	22	24	26	27

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	17	15	13	12	12	11	10	10	9	9	9	9	11	15	18	19	20	21	21	21	21	21	20	19
NORTHERN SOUTH AMERICA	22	21	19	17	16	15	14	13	12	12	11	11	12	16	19	21	22	23	24	25	25	25	24	24
CENTRAL SOUTH AMERICA	26	23	21	19	18	17	16	15	14	14	13	13	19	21	23	25	26	27	28	28	29	29	29	28
SOUTHERN SOUTH AMERICA	28	25	23	21	20	18	17	16	15	14	14	13	16	20	22	24	26	27	28	29	29	30	30	29
WESTERN EUROPE	9	9	8	8	8	8	8	8	8	8	8	12	15	16	17	17	17	17	17	16	15	12	10	9
EASTERN EUROPE	9	8	8	8	8	8	8	8	8	8	8	10	15	16	16	16	16	15	14	13	11	9	9	9
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CENTRAL NORTH AMERICA	16	14	10	10	9	9	8	8	8	8	8	8	8	12	15	17	18	18	19	19	19	19	18	17
WESTERN NORTH AMERICA	22	20	17	13	12	12	11	11	11	10	10	10	10	10	17	20	22	23	24	24	25	24	24	23
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JAPAN	16	14	10	10	10	9	9	9	9	8	8	8	8	9	9	9	9	8	8	8	8	12	15	17
CENTRAL ASIA	15	13	10	10	9	9	9	9	8	8	8	8	8	12	12	11	11	11	11	10	10	10	10	17
INDIA	8	8	8	8	8	8	9	8	8	8	8	8	12	15	15	15	14	13	12	10	9	9	9	9
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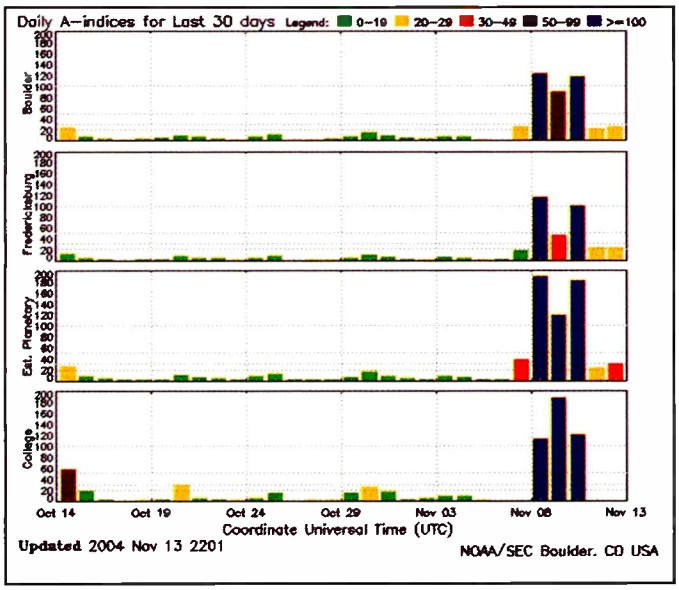
CHINA	14	11	10	10	9	9	9	9	8	8	8	8	8	10	10	9	9	9	9	8	8	8	8	8
SOUTH PACIFIC	28	26	22	20	18	17	16	15	14	14	13	13	13	13	18	16	15	15	19	22	24	26	27	28



The Kp levels during the storm of November 7 to November 10, 2004. The geomagnetic activity reached extreme storm levels of 9. (NOAA)

British Columbia, Canada, records the daily solar flux measurement. The solar flux index broadcast ranges from a theoretical minimum of about 50 to numbers larger than 300. During the early part of each 11-year sunspot cycle, the flux numbers are low, but they rise and fall as the cycle proceeds. The numbers will remain high for extended periods around sunspot maximum. (See the sidebar for more details.)

The *K indices* are a measurement of the behavior of the magnetic field in and around the Earth. The K index uses a scale from 0 to 9 to measure the change in the horizontal component of the geomagnetic field. A new K index is determined every three hours based on magnetometers around the world. Usually, the reported K index is the *planetary K index (Kp)*, which is an average of all the many K index readings from around the globe.

The *planetary A index (Ap)* is a daily value measured on a scale from 0 to 400 to express the range of disturbance of the geomagnetic field. It's obtained by converting and averaging the eight, 3-hour K index values. An estimate of the A index is first announced at 2100 UTC, based on seven measurements and one estimated value. At 0000 UTC, the announced A index consists entirely of known measurements, and the word "estimated" is dropped from the announcement.

Space weather describes the conditions in space that affect earth and its technological systems. Space weather is a consequence of the behavior of the sun, the nature of earth's magnetic field and atmosphere, and our location in the solar system.

Space weather storms observed and expected are characterized using the NOAA Space Weather Scales. The abbreviated table in **Table 1** shows the levels of activity that are included in the announcements and the associated terminology. The descriptor used to identify observed or expected conditions is the maximum level reached or predicted. The NOAA Space Weather Scales are further described on the Space Environment Center's website at http://www.sec.noaa.gov/NOAAscales.

Geomagnetic storm levels are determined by the estimated three-hourly Kp indices derived in real time from a network of Western Hemisphere ground-based magnetometers. These levels are shown in **Table 2**. When the K index reaches 6 and above, there is a very good chance that Au conditions exist. When the K index reaches 5 or higher, you might wish to check Au conditions at http://www.sec.noaa.gov/pmap/.

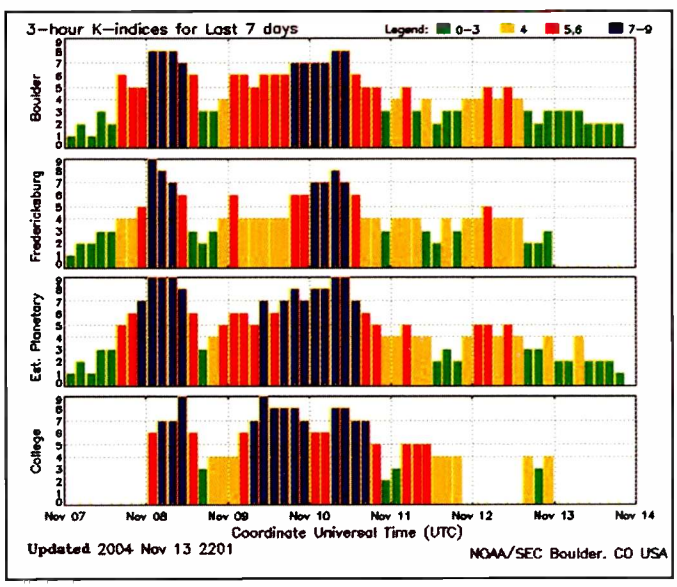
Table 1. NOAA Space Weather Scales

Geomagnetic Storms	Solar Radiation Storms	Radio Blackouts	Descriptor
G5	S5	R5	Extreme
G4	S4	R4	Severe
G3	S3	R3	Strong
G2	S2	R2	Moderate
G1	S1	R1	Minor

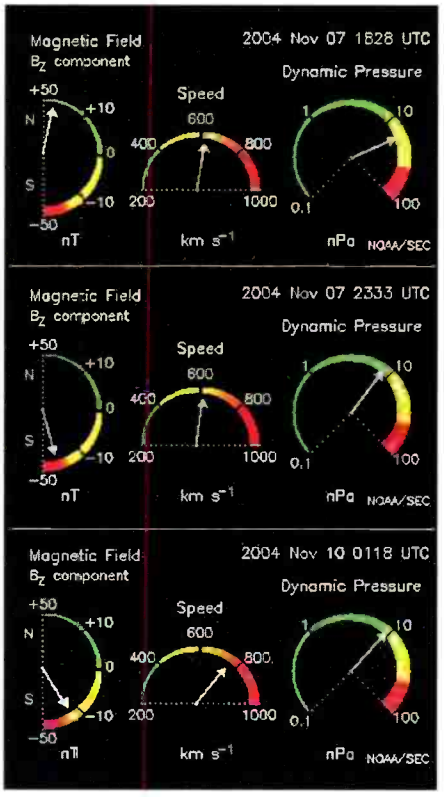
Solar radiation storm levels are determined by the proton flux measurements made by NOAA's primary Geostationary Operational Environmental Satellite (GOES). **Table 3** details these levels.

Radio Blackout levels are determined by the x-ray level measured by the primary GOES satellite. X-ray radiation ionizes the *D* layer causing absorption of HF signals, starting at the lower frequencies and increasing up to higher HF frequencies with higher levels of radiation. X-ray levels and related flares are categorized using the letters B, C, M, and X, with X being the most intense. **Table 4** correlates x-ray levels and flux to radio blackout levels.

Every geophysical alert consists of three parts. The first part contains the solar-terrestrial indices for the day, specifically the solar flux, the A index, and the K index. The next part is the space weather storms observed during the previous 24 hours. This includes all observed geomagnetic storms, solar radiation storms (proton events), and radio blackouts (class M1 and greater flares). Finally, the third part gives the space



The Ap levels during the storm of November 7 through November 10, 2004. The Ap index reached as high as 189, indicating a pretty strong geomagnetic storm level. The geomagnetic storm lasted for several days and virtually wiped out communications on medium and high frequencies. (NOAA)



The top instance of the Real-Time Solar Wind Scales provided by NOAA shows the strong solar wind speed at the beginning of the storm of November 7, 2004. As the storm started, the Interplanetary Magnetic Field (IMF) was oriented opposite of the Earth's geomagnetic field, so the increase in solar wind speed and density barely effected the Kp readings. However, when the IMF reversed, as shown by the Bz component turning negative in the next two instances shown, the geomagnetic field became very stormy, as recorded by the Kp indices which reached the maximum level of 9. (NOAA)

weather expected during the following 24 hours. An example geophysical alert is as follows:

"Solar-terrestrial indices for 08 February follow. Solar flux 89 and Mid-Latitude A-index 26. The Mid-latitude K-index at 1500 UTC on 08 February was 4. Space weather for the past 24 hours has been moderate. Solar radiation storm(s) reaching the S4 level is in progress. Radio blackouts(s) reaching the R2 level occurred."

Here's another example:

"Solar-terrestrial indices for 08 February follow. Solar flux 109 and Mid-Latitude A-index 17. The Mid-latitude K-index at 1500 UTC on 08 February was 3. No Space weather storms have been observed during the past 24 hours. Space weather for the next 24 hours is expected to be severe. Solar radiation storms reaching the S4 level are expected to continue. Radio blackouts reaching the R2 level are expected."

To hear the current geophysical alert message, tune to one of the frequencies of WWV or WWVH at the times provided above. My eAlert e-mails contain these reports, plus other related information. If you wish to sign up for my eAlerts, visit http://propagation.hfradio.org/ealert/.

Current Cycle 23 Progress

The Sun has proved again that solar activity can flare up unexpectedly at any time during the decline of the 11-year solar cycle. A great example is the flare-up during November 2004. A weeklong series of coronal mass ejection (CME) shock waves barraged the Earth during the week of November 7. The passage of many solar plasma clouds, the result of moderate to strong solar flares just days before, caused severe geomagnetic storms that wiped out virtually all HF and MW communications, though it did provide great Au mode propagation on VHF and above. Kp index readings reached 9 at times (the highest index mark). The resulting planetary A index (Ap) reached 189 on November 8, 120 on November 9, and back up to 181 on November 10, 2004.

Table 2. Geomagnetic Storm Levels

Kp Indices	Geomagnetic Storm Level
K = 5	G1
K = 6	G2
K = 7	G3
K = 8	G4
K = 9	G5

Table 3. Solar Radiation Storm Levels

Flux Level of >10 MeV Particles	Solar Radiation Storm Level
10	S1
10^2	S2
10^3	S3
10^4	S4
10^5	S5

Table 4. Radio Blackouts (Caused by X-ray Flares)

Peak Flare X-ray Level	X-ray Flux Level	Radio Blackout Level
M1	10^{-5}	R1
M5	5×10^{-5}	R2
X1	10^{-4}	R3
X10	10^{-3}	R4
X20	2×10^{-3}	R5

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for October 2004 was 48, up from September's 28 and August's 41. The lowest daily sunspot value during October was recorded on October 10, with a count of zero. The highest daily sunspot count was 99 on October 24. The 12-month running smoothed sunspot number centered on April 2004 was 46, a point under March's. A smoothed sunspot count of 22 is expected for February 2005, give or take about 12 points.

The Dominion Radio Astrophysical Observatory reports a 10.7-centimeter observed monthly mean solar flux of 106 for October 2004, up three points from September. The 12-month smoothed 10.7-centimeter flux centered on April 2004 is 112, down from March's 115. The predicted smoothed 10.7-centimeter solar flux for January 2005 is about 83, give or take about 16 points.

The observed monthly mean Ap index for October 2004 was 9, down a point from September. The 12-month smoothed Ap index centered on April 2004 is 16, about one point down from March. Expect the overall geomagnetic activity to be quiet to active during most days in February, though there is a possibility of a strong geomagnetic storm.

HF Propagation

We're starting to approach the end of the winter season. The period of darkness is growing shorter, causing the average daily maximum usable frequencies (MUFs) to rise a bit. At the same time, noise levels are still low, making for reliable DX. The solar activity is moderate, and holds enough energy to keep the mid-HF spectrum alive with signals. General conditions are expected to be good to excellent for HF propagation throughout February.

Nineteen meters through 15 meters will open shortly after sunrise and will remain open until early to late evening. Morning and evening DX openings between some areas in the Northern Hemisphere on these bands are very short, because the band in question closes on one end of the path before it opens on the opposite end. Transequatorial propagation on these bands will be more likely toward sunset during days of high solar flux and a disturbed geomagnetic field (look for days with an Ap greater than 15, or a Kp greater than 3).

Paths on 31 through 22 meters remain in their seasonal peak much like in January, but with longer openings. Continue to look for great openings between North America and Europe in the morning and between North America and Asia during the late afternoon hours. Twenty-two meters will often be the best daytime DX band, with 31 and 25 running a close second.

Ninety through 41 meters will be useful almost 24 hours a day. Daytime conditions will resemble those of 25 meters, but skip and signal strength may decrease during midday on days with high solar flux values. Nighttime will be good except after days of very high MUF conditions. Generally, the usable distance is expected to be somewhat greater on the higher of these bands than on 90. DX activity tends to increase later in the evening toward midnight. Look for Africa and the South Pacific (Australia, Papua New Guinea, and so on) on 90 through 60 meters throughout the night. On 41, 49, and 60 meters, long-path DX is possible along the gray line.

The 120-meter band continues to remain stable, with very low noise levels. Throughout the winter season, high noise may occur during regional snowstorms. The band opens just before sunset and lasts until the sun comes up on the path of interest. Except for daytime short-skip signal strengths, high solar activity has little impact. Continue to look for Europe and Africa around sunset until the middle of the night, and then Asia, the Pacific, and the South Pacific as morning approaches.

Signals below 120 meters will remain strong and exciting, except during times of regional storms and high geomagnetic activity. Mediumwave DX is still quite hot throughout February.

VHF And Above

There are no major meteor showers during February that could provide any VHF meteor scatter propagation. But other modes may be possible. Check for 6-meter short-skip openings during the daylight hours. Some short-skip openings over distances of about 1,200 to 2,300 miles may occur. The best times for these are during the afternoon hours.

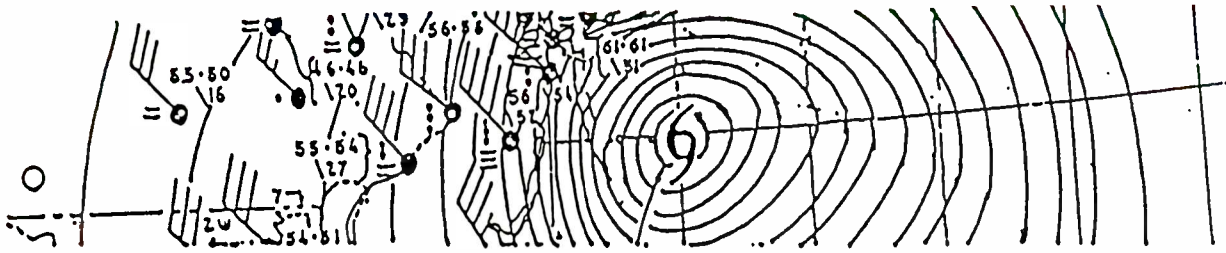
Au activity often occurs during periods of radio storminess on the HF bands. Look for days where the planetary Ap index is climbing and when the Kp index reaches 4 or higher. These are the days on which VHF Au-type openings are most likely to occur.

I'd Like To Hear From You

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

Please don't hesitate to write and let me know about any interesting propagation you've noticed. Do you have questions about propagation? I look forward to hearing from you. Turn on your favorite radio and enjoy the great DX season on the medium and shortwaves. Happy hunting!

Exciting Weather Books!



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by Harold Ort, N2RLL, Editor

SkySweeper Standard V. 3.07

When it comes to decoding those "strange" digital transmissions, there's certainly numerous software choices out there for radio monitors and hams alike. To be sure, some even have what one fellow described as a "cult following." But when it comes to features, reliability, and fast, courteous tech support, I've found the SkySweeper program to be top-notch.

The SkySweeper product family offers up three versions: SkySweeper Standard, SkySweeper Standard Plus, and SkySweeper Professional. I've been using the Standard version for several months now and have found it to be versatile and easy to understand and use. It's almost as if I wrote the program for myself, it's that intuitive!

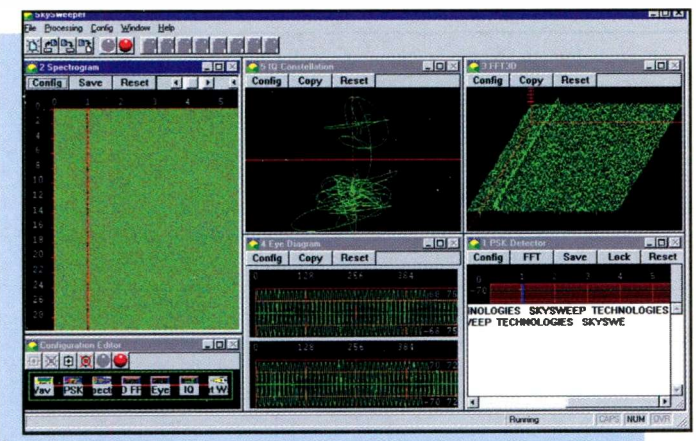
The Standard version includes receive and transmit capability for CW, RTTY, PSK31, PSK63, PSK125, MFSK16, 2MFSK16, 4MFSK16, QPSK31, SkyBoost, SSTV, and HELLSCHREIBER modes. It's the key member of the SkySweeper product family, and is primarily for advanced hams and DXers looking for a good performer for the most common amateur modes, as well as for decoders for the most common utility modes.

SkySweeper Standard's *receive-only* modes are ACARS, AX.25 packet, DGPS, GMDSS/DSC (HF), GMDSS/DSC (VHF), HFDL (HF ACARS), HF-FAX, MIL-ALE (MIL-STD-188-141A), PACTOR-1, ICAO SELCAL, SITOR-A (AMTOR), SITOR-B (NAVTEX), SHIP, SYNOP, and WEFAX (NOAA/TIROS).

What You Need

To get started you'll need a computer with Windows 95, 98, NT, 2000, ME, or XP and 30 MB of free disk space. The SkySweep tech folks say it must have a 600-MHz processor speed, but actually *recommend* a 1-GHz processor and 64 MB of memory at a minimum (they also *recommend* 128 MB). I'm using a machine with a 1400-MHz processor speed and 256 MB of memory.

I recently upgraded the computer's video card to enable my computer to better handle a video-intensive program such as SkySweeper. That's not to say you would *have* to run out and buy a replacement video card, but chances are if you're using an older computer, you'll know if you need a new one, believe me.



Here's a sample SkySweeper screenshot of a PSK signal being decoded.

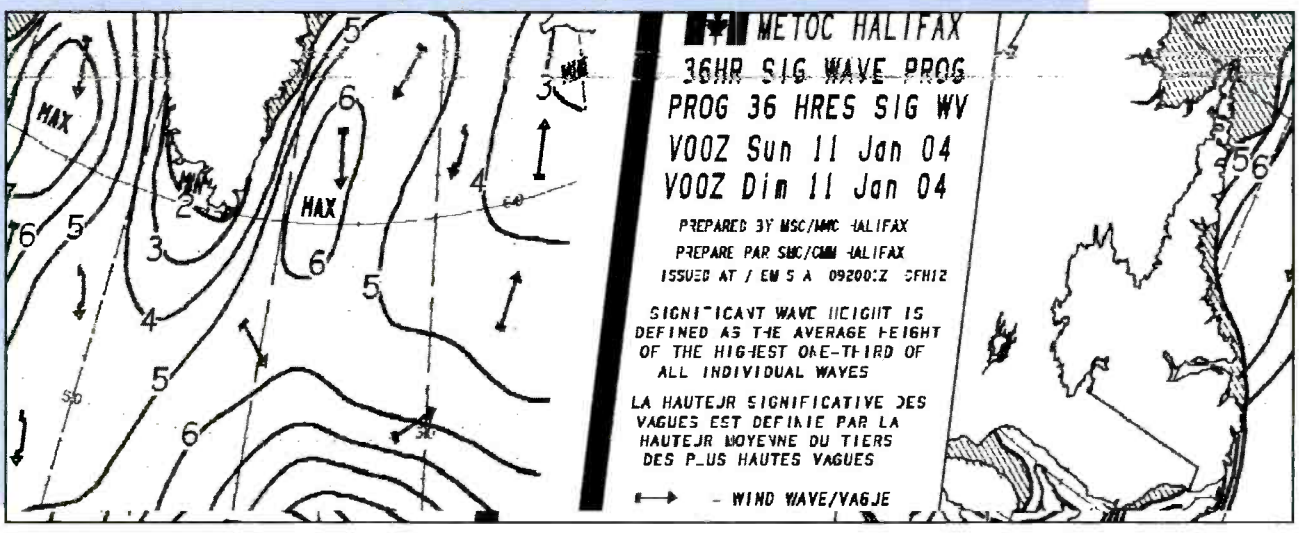
So, basically, you're all set if you've got the Windows computer and auxiliary cables for connecting your receiver/transceiver. With SkySweeper there's nothing you need to buy or configure (except for adjusting your computer's simple audio controls, which takes two minutes). For basic receiving and transmitting, SkySweeper requires only two audio cables (RX &TX between PC and transmitter) if transmitter VOX is used. If separate PTT keying is needed, SkySweeper also supports the option of using the computer's RS-232 or LPT port for the PTT control (connected directly from PC to the transceiver). No other interface is needed. LPT support and better VOX support was released in the latest SkySweeper versions, 3.07/4.07/5.07. If you want to use an external interface like SignaLink, it's possible, but not required.

Getting Started

You can start by downloading a free demo version of SkySweeper at www.scancat.com/demos, the home of Computer-Aided Technologies, the U.S. distributor of SkySweeper, which is produced by SkySweep Technologies, a Finnish high-tech company whose main focus is on advanced digital signal processing software for HF/VHF applications). No doubt you'll like it, then it's simply a matter of registering it and paying about $99.95 for the full version, which gives you future upgrades, tech support, and a lot more. (The SkySweeper Standard Plus is $299.95; the Professional version is $599.95—always with free upgrades in the same version, or you can later decide to *pay the difference* should you decide to upgrade to the next higher version. I'd recommend you download the 250-plus page manual—free!—at the same demo site. You might be asking why spend nearly $100 on a digital program when others are much less, or even free. Good question, and the answer is simply the multitude of features, excellent DSP, filtering, and modes, both receive and transmit, that you get with SkySweeper that are only dreams elsewhere!)

SkySweeper uses the Windows system default sound card. If your sound card seems configured improperly, you'll need to get it working in the duplex mode using the line input. Click the "loudspeaker" icon in the toolbar. This opens the play control panel. Ensure that your output is not muted, then set the volume to the desired level. Make sure that the inputs from Line-In and Microphone are muted. If they are activated, it will cause an unwanted echo effect when running SkySweeper.

Next, click the "microphone" icon. This opens the record control panel. If your radio is connected to the sound card's "Line-In" input, then select "Line-In" and set the Line-In volume to the maximum and mute (i.e., do not select) other inputs. If your input signal is connected to the sound card's "microphone" input, then activate "microphone" and mute the others (including Line-In).



This captured screenshot shows part of a WE-FAX transmission from Halifax, Nova Scotia. I use my amateur transceiver, a Ten-Tec Jupiter, for receiving digital transmissions. The radio always stays connected to the computer.

Your next step is to open your sound card support software. If your sound card supports real-time effects (for example, echo), be sure that all effects are switched *off*. Make the same settings for the sound card's mixer if there is one.

From there it's simply a matter of turning on the radio, opening SkySweeper, and using your mouse to click the green on-screen "button," then choosing the mode you want to use.

How SkySweeper Performs

SkySweeper provides high-quality DSP tools including a designable filter, notch filter bank (with up to eight filters), numerous analyzers and displays, enough, in fact, to almost mesmerize any radio user—newcomer or oldtimer—while looking at the computer monitor for hours on end! (And after all, isn't having fun what this radio hobby is all about, anyway?)

But beyond the razzle-dazzle of the colorful displays and status screens, the pure functionality of SkySweeper is outstanding! There are enough working

Amateur Digital Operating Frequencies

Meter Band	Frequencies/Modes
40	7070.15 PSK31 7080 RTTY
30	10130 to 10140 RTTY 10130 PSK31 10137.15 PSK31
20	14070 to 14095 RTTY 14070.15 PSK31
17	18100 to 18105 RTTY 18100.15 PSK31
15	21070 to 21100 RTTY 21080.15 PSK31
12	24920 to 24925 RTTY
10	28070 to 28150 RTTY 28070.15 PSK31 28120.15 PSK31

modes to keep any ham or radio monitor busy for days on end.

Let's suppose you're studying for your ham ticket. SkySweeper is perfect for learning CW, or for *using* it live on the air. You hear the code, see it decoded, and then see it automatically displayed on your monitor. *You* set the range for SkySweeper to search for transmissions, the program locks onto the frequency (you'll see a vivid, bold blue line on SkySweeper's spectrum display) and the decoding begins.

One of the hottest modes folks are decoding today is the MIL-ALE (MIL-STD-188-141A). Similar to how it decodes CW, when it locks onto a MIL-ALE transmission, SkySweeper does the rest, automatically showing the blue line indicating a frequency lock, and you've captured the transmission!

Your best bet for finding MIL-ALE transmissions is to check out Steve Douglass' "Utility Communications Digest" in each issue of *Pop'Comm*. There you'll find dozens of reader-submitted loggings that will get you started. After a while, you'll be so much a part of the action you won't remember when you began using SkySweeper!

Best bet frequencies to get you started include 11637 (Jacksonville, FL Air Route Traffic Control Center, ARTCC), 15851 (Minneapolis ARTCC and other stations), 7805 (Hillsborough, NH), 12070 (Army Corps of Engineers), 7527, 8912, 13907 (CGAS Clearwater), 10242 (CGAS Elizabeth City, NC), 18594 (CGAS San Diego), and 10389.5 (Department of Veterans Affairs) stations. Clearly we're only scratching the surface of what's out there, but you get the idea: tuning is a breeze and decoding with the SkySweeper is fast, fun, and easy!

The WE-FAX decoder in SkySweeper allows you to easily decode tuned WE-FAX transmissions and even save the picture for later viewing *or* printing.

Hams will get a thrill out of the many digital modes in SkySweeper. My favorite is qpsk31. What are the frequencies, you ask? I asked the same questions initially, and found the best reference to be the ARRL's *HF Digital Handbook* (Third edition, 2003) by Steve Ford, WB8IMY. It's $19.95 from the League's website, www.arrl.org. We've provided some here to get you started (see box).

You'll also learn by doing, and there is a world of radio adventure awaiting you. For a sample of amateur activity, let SkySweeper's well-written instructions guide you through the steps to be on the air in minutes—no hassles or "decoding" of encrypted online manuals, either!

Bottom Line?

Believe me, you don't have to be Bill Gates to use SkySweeper. I can do it, so can you, and with a minimal amount of computer knowledge! There's no steep learning curve with SkySweeper—I was up and running a few minutes after installation. As with all software, though, you've got to take your time and *think* about what you're doing; go quickly without reviewing the manual and you'll likely get stuck needlessly.

I'd recommend SkySweeper to anyone who wants the best, without compromise. For more information, contact the U.S. distributor, Computer-Aided Technologies, at www.scancat.com, call them at 318-687-2555, or write to them at P.O. Box 18285, Shreveport, LA 71138. And don't forget to tell them that you read about SkySweeper in *Popular Communications*! ■

Special SkySweeper Technologies Notice

SkySweeper Technologies has just announced that this month they're releasing two new (RX & TX) modes: STANAG 4285 and STANAG4539/MIL-STD-110A/B. Both are used widely by the NATO and U.S. military forces. These modes will be available in SkySweeper Plus and SkySweeper Pro products.

by R.B. Sturtevant, KD7KTS

Radio Fun And Going Back In Time

Q. How did World War I wireless operators hide their antennas from the enemy?

A. During the First World War the standard U.S. Army antenna was on top of a 210-foot mast. They were alright for the rear areas, but erecting one too close to the front lines usually made it rain artillery shells. Troops further forward used 10-foot bamboo poles, which could be raised just above the trench when transmitting. That wasn't any good for the frontline troops, however. They resorted to burying cable in the ground and covering it with dirt or mud. Their transmissions were made by utilizing the ground wave. It didn't go as far, but it didn't draw artillery fire.

The idea came back in fashion during the 1960s when the military was looking for ways to communicate between command centers and missile silos. Transmitting through the air depended on antennas that might not be there if the enemy nuked us first, and landlines wouldn't have been much better. So we went back to testing ground wave transmissions at Edwards Air Force Base, California, using an abandoned borax mine in the Mojave Desert. Just because an idea is old doesn't mean it won't work.

Q. Commercial radio seems to have been around forever. When did it actually start?

A. Historical records show 1922 as the first year of commercial broadcasting in the United States. There were 60,000 households with receivers in the entire country. Most were crystal sets built by experimenters and amateurs. They were built with wire wound around an oatmeal box with crystal detectors, capacitors, and a headphone bought from a catalog. Radio was so important that when Quaker Oats developed their trademark round box a radio engineer was on the development team. Building crystal sets is still a lot of fun.

Q. Do the illiterate tribesmen of Afghanistan really understand the sophisticated communications being used on their behalf?

A. Sergeant "Calvin" Markham is quoted in the book *No Room For Error.* He was involved in a firefight with Al-Qaeda and Taliban fighters. Markham and other Army-Air Force Special Forces troops were leading an anti-Taliban group of the Northern Alliance. The Northern Alliance forces came under withering fire when the Taliban gunners lowered their anti-aircraft guns and fired at close range. Markham, a special tactics air support controller, was working on getting an air strike organized. A brave young Afghan threw himself in front of the radioman to give him cover. "What are you *doing*?" screamed Markham. The young Afghan calmly told Markham "If they kill me I will be replaced. If they kill you the airplanes will go away."

Q. What is the world record for the world's lowest power QRP contact?

A. All QRP operators will have stories I'm sure, but you're going to have to hear quite a few to beat John Butcher, G5XG. According to *QST* magazine, June 1937, G5XG made contact on a 20-watt transmitter with an amateur in Rome, Georgia. During the QSO G5XG made several reductions in power to see how low he could go and maintain contact. He got down to 2 1/2 watts (75 mils antenna current) and was still S4 into Georgia. The Englishman reduced power again and announced his plate input and his antenna current were both zero but had a report of S3-4 in Georgia. A Midwest station was monitoring the QSO and confirmed it. The *QST* article then said "remember, this column reports these things as they are told to us, so don't take issue with us." Analog meters and radio equipment of the '30s weren't built to the same standards as we use today, but that has got to be some kind of a record.

Q. During World War II radio operators had to work under some pretty adverse conditions. With all the rain and humidity in the South Pacific how did they keep their radio dry enough to operate in the wet seasons?

A. Many of our ingenious military operators were also experienced hams. They had learned to keep a set working in damp weather by never turning the equipment off. In the old tube-type radios the "fire bottles" kept things dry enough to operate.

Looking Back...

Five years ago in *Pop'Comm*

How time flies! Just five years ago we were talking about Solar Cycle 23 reaching solar maximum—today, it's a different story as we're at the end of Cycle 23 and thinking about the changing radio conditions on the horizon. He's still at it: The FCC's Special Counsel for Amateur Radio, Riley Hollingsworth, "The Enforcer" to hams and radio monitors. We interviewed Riley for that issue of *Pop'Comm*, and he told us, "We'll take complaints any way we can get them..." That he does—and he fixes the problems! Writer Alan Dixon reported in the former "CB Scene" column about his official petition to the FCC to eliminate the "155-mile rule" which prohibits CBers from talking over more than 155 miles. Of course in the end, the FCC said no.

Ten years ago in *Pop'Comm*

AOR's AR-8000 was brand new and we reviewed it in the February 1995 *Pop'Comm*. This 1,000-channel scanner/shortwave receiver included a 100-plus page operating manual that even old-timers said was required reading! Optoelectronics of Fort Lauderdale, Florida, had just introduced its new Scout—it automatically "finds and records frequencies, will tune a receiver and can differentiate between random noise and coherent RF transmissions."

Twenty years ago in *Pop'Comm*

A full-page Regency Electronics ad in our February 1985 issue highlighted the company's MX7000 scanner, a 20-channel "no-crystal unit that receives continuously from 25 to 550 MHz and 800 MHz to 1.2 GHz..." Great coverage, even including the cell phone band! An excellent article by Gerry Dexter, "Soviet Broadcasting—An Inside Look" noted that, "In any given hour, broadcasting from the Soviet Union on shortwave contains Radio Moscow's programming in various languages..."

by Gerry L. Dexter

BPL Noise, Plus U.S. Psyops In Afghanistan

In this month's "Homeland Security" column you'll find the latest news on BPL (Broadband over Powerline) and the FCC's most recent—and not unexpected—decision to approve BPL technology in the US. The wide-ranging impact of BPL will be felt across the radio spectrum as we try to listen and communicate amid the din of BPL-generated interference. BPL made people who use the high frequencies very nervous when the idea was first proposed. And after hearing the interference BPL caused in tests, those people—and many more—expected that the end of shortwave was just 'round the next bend. Now, despite the adoption of BPL, some are beginning to think we may get through this largely unscathed. Supposedly, the FCC will implement stringent rules concerning interference (there's this bridge we have for sale!) and those who have followed the issue are beginning to believe power companies may be cautious about investing big bucks in an already controversial technology, especially since newer and more logical methods already exist (Wi-Fi) or are out there just over the horizon. We can only wait and see. But if you learn that your local power company is going to adopt BPL make some noise, raise a stink, organize a protest. Don't just sit there and let it happen. We have heard what BPL QRM sounds like and it isn't pretty! About the only thing you'd be able to hear through it is WEWN!

Also of interest this month are the U.S. psyops broadcasts for Afghanistan (originally known as Information Radio), which are now called Radio Solh (Radio Peace) and are being relayed by the 500-kW Rampisham, UK, transmitter of VT Merlin Communications. The schedule is,

0200–0400 on 9695
0600–0700 on 13650
0700–0800 on 17560
0800–1300 on 21620
1300–1500 on 15265
1500–1600 on 9750
1600–1700 on 11885
1730–1830 on 9800

All broadcasts are beamed to Afghanistan in local languages. Despite the target, several of the higher frequency channels have already been monitored here. The broadcasts feature a great deal of local music.

Radio Australia Gets A Boost

A long overdue financial shot in the arm is in Radio Australia's future. After suffering severe budget reductions over the past few years, cuts that resulted in its having to give up its site at Darwin—which was eventually leased to Christian Voice—the government in Canberra is making amends. Several million dollars in new funding will bring the personnel back to former operational levels and put lost services back in action. Once the Christian Vision lease expires, which won't happen for several years, it looks like an effort will be made to make Darwin's facility strictly an RA outlet again. Good onya!

Also, VT Merlin is now relaying Radio Australia, via their sites at Rampisham, England and Dhabbaya in the UAE.

Radio Six International is one of the broadcasters carried over WBCQ-The Planet on 7415 and recently QSL'd by Rich D'Angelo (PA).

Radio Nacional, Malabo, Equatorial Guinea, has an inoperative transmitter at the moment. The word is that it will require several months to make the repairs (the transmitter is so old that the needed parts have to be specially made). Try an occasional pass-by on **6250** around 0500 and maybe you'll spot its return.

It might be that **Radio Bahrain** isn't completely off shortwave after all. A couple of people in Europe have heard an Arabic speaker on **9745** (there was one report of an actual ID), so it may be that the transmitter is used on an irregular basis rather than being completely silent.

Another new anti-Iranian broadcast is the **Women's Forum Against Fundamentalism in Iran**, which is supposed to air Saturdays from 1900 to 1930 on **9495.**

Russia's **RadioTikhy Okean**, effectively off the air on shortwave for the past year or so, ran some tests on **9480** late last year. At this writing we can only guess, or hope, that the tests indicate a return soon. Incidentally, The Voice of Russia celebrated 75 years of international broadcasting last year. Moscow Radio began with broadcasts to Germany in 1929.

The Kurdish clandestine **Deng Kurdistana** (Voice of Iranian Kuridstan) is now being heard—out east, anyway—on **4860** around 0300/0400 with programs in Farsi. This should give everyone a somewhat better shot than those low 4-MHz channels they've favored in the past.

The Salaam Watandar service we mentioned as closing a time or two back is still active on shortwave and will remain so indefinitely.

It is (and always has been) a real challenge to hear any of the handful of Uruguayan shortwave broadcasters. Now you can, although not direct from Uruguay. **Radio Cimarrona** is being aired **via Germany**, although it's more of a program than an relay of an actual station. The broadcasts are at 2200 Sundays and Mondays on **9480**, apparently via the DTK Julich site and are produced by a group called Testimonios.

If you check **5030** for **Radio Burkina Faso** now and then and don't hear them, this may be a good reason: The station is said to be active only when sports events are scheduled for broad-

cast coverage, which, apparently, is most likely on Wednesdays and Saturdays.

Watch **7120** for a new missionary station due on the air from **Papua New Guinea**, affiliated with the new CRN in PNG on **4960**.

The slow, but seemingly inexorable water torture of shortwave's slowdown continues. We have word that Radio Vlaanderen International will make drastic cuts in its service at the end of March and be renamed VRT International. Broadcasts in English, German, and French are to be dropped as well as much of the Dutch language shortwave broadcasts. This unfortunate decision also means that most, if not all, of the sites RVI uses outside Belgium will be discontinued. Drip...drip...drip...

And **Radio Cairo** has made extensive cuts in its service. These went into effect with the end of the A04 season and include the closure of Portuguese to Brazil, along with several other languages. Broadcasts in English, Spanish, and French at least will continue.

Changes are coming in Hungary, too, namely, the privatization of the shortwave transmitter facilities there. The Szkesfehervar site has been closed down (leaving only Jaszbereny, which will gain the antennas from Szkesfehervar). While this process is taking place, some of Radio Budapest's broadcasts will come from the Rimavska Sobota site in Slovakia.

Your Loggings

Remember your shortwave broadcast loggings are always welcome! Please be sure to list them by country and include your last name and state abbreviation after each log. We also have a continual need for illustrative material, whether QSLs (good copies or originals you don't need returned), general station news and information, pennants, schedules, etc. And, last but not least, a picture of you at your monitoring position. Why are you so shy?

Here are this month's logs. All times are in UTC, where 0000 equals 7 p.m. EST, 6 p.m. CST, 5 p.m. MST and 4 p.m. PST. Double letters (SS, RR, AA, PP, etc.) are language abbreviations (Spanish, Russian, Arabic, Portuguese, etc.). If no language is specified, the broadcast is assumed to have been in English (EE). For other abbreviations see the sidebar elsewhere in this column.

ALBANIA—Radio Tirana, 6115/7160 at 0249 with listener letters in response to a contest. Off at 0257. (Burrow, WA)

ANGUILLA—Caribbean Beacon, 11775 at 1254 with Gene Scott sermon on why cigar smoking is not sinful. (Brossell, WI) (*Why? Because Gene Scott smokes them, of course!—gld*)

ANTIGUA—BBC Relay, 15190 at 1430. (Paradis, ME)

Abbreviations Used In This Month's Column

(p)	—	presumed
(t)	—	tentative
//	—	parallel
AA	—	Arabiv
AFN	—	Armed Forces Network
AFRTS	—	Armed Forces Radio TV Service
AIR	—	All India Radio
anmt(s)	—	announcement(s)
anncr	—	announcer
AWR	—	Adventist World Radio
BSKSA	—	Broadcasting Service of the Kingdom of Saudi Arabia
CC	—	Chinese
co-chan	—	co-channel (same) frequency
comml	—	commercial
CP	—	Bolivia, Bolivian
CRI	—	China Radio International
DD	—	Dutch
DJ	—	disc jockey
DW	—	Deutsche Welle/Voice of Germany
EE	—	English
f/by	—	followed by
FEBA	—	Far East Broadcasting Association
FEBC	—	Far East Broadcasting Company
FF	—	French
GBC	—	Ghana Broadcasting Corp.
GG	—	German
HH	—	Hebrew
HH	—	Hungarian
HOA	—	Horn of Africa
ID	—	identification
II	—	Italian; Indonesian
Int	—	International
IRRS	—	Italian Radio Relay Service
IS	—	interval signal
JJ	—	Japanese
KK	—	Korean
LSB	—	lower sideband
LV	—	La Voz
NBC	—	National Broadcasting Corporation (Papua New Guinea)
ORTB	—	Office deRadiodiffusion et Television du Benin
PBS	—	People's Broadcasting Station (China)
PP	—	Portuguese
PSA	—	public service announcement
QQ	—	Quechua
RCI	—	Radio Canada International
Rdf	—	Radiodifusora, Radiodiffusion
REE	—	Radio Exterior de Espana
RFA	—	Radio Free Asia
RFE/RL	—	Radio Free Europe/Radio Liberty
RNZI	—	Radio New Zealand International
RR	—	Russian
RRI	—	Radio Republik Indonesia
RTBF	—	RTV Belge de la Communaute Francasie
relay	—	site not owned by broadcaster
Relay	—	owned/operated by the broadcaster
s/off	—	sign off
s/on	—	sign on
SIBS	—	Solomon Is. Broadcasting Corp.
sked	—	schedule
SLBC	—	Sri Lanka Broadcasting Corp.
SS	—	Spanish
TC	—	time check
TOH	—	top of the hour
TT	—	Turkish
TWR	—	Trans World Radio
unid	—	unidentified
USB	—	upper sideband
UTE, ute	—	utility station
v	—	variable
vern	—	vernacular (local language)
VOA	—	Voice of America
VOIRI	—	Voice of Islamic Republic of Iran
ZBC	—	Zambian Broadcasting Corp.

The Russian time signal stations are seldom reported in North America but Rich D'Angelo captured RWM on 9996 and 14996 and later got this very attractive card.

ARGENTINA—Radio Nacional, 6060 with SS talk at 0924. (DeGennaro, NY) RAE, 11710 at 0202 with schedule, QSL info, program highlights and tango music until news at 0215. (Burrow, WA) 15345 at 1710 to Europe in SS at 2315. (DeGennaro, NY)

ASCENSION ISLAND—BBC Relay, 6005 with world service heard at 0310. (D'Angelo, PA) 15400 with Newshour at 2000. (Jeffery, NY)

AUSTRALIA—Radio Australia, 5945 via Austria in GG to Europe at 1956. Also 9580 at 1048 and 9580 at 1045. (DeGennaro, NY) 5995 at 1200, 6020 at 1235, 9475 at 1145, and 9580 at 1205. (Northrup, MO) 9580 at 1314 and 21740 at 2224. (Charlton, ON) 12080 at 1120. (Ziegner, MA) 13630 at 0520. (Barton, AZ) 15515 at 0232. (Brossell, WI) 0418. (MacKenzie, CA) ABC Northern Territory Service, Alice Springs, 2310 with news at 0920. (Montgomery, PA) 1105 with comedy program. (Wilkner, FL) Voice International, 13635 with religious talk at 1309. (Brossell, WI) 13685 with gospel music at 1039. (Foss, Philippines)

AUSTRIA—Radio Austria Int., 6155 in GG at 2028, 9870 in EE at 2356 and 13730 in GG at 0950. (DeGennaro, NY) 9870 at 0020. (Charlton, ON)

BELARUS—Radio Belarus, 7210 at 0159 with IS, and into EE programming with IDs, sked and news. Closing at 0229, // weaker 5970. (Alexander, PA)

BELGIUM—Radio Vlaanderen Int., 11635 via Bonaire, with music at 2211. (Charlton, ON)

BRAZIL—(all in PP) Radio Nacional Amazonia, 6185 at 0020, //11780. (Alexander, PA) 2307 on 6190 at 0934 and 11780 at 0305. (DeGennaro, NY) 2240. (MacKenzie, CA) 2358. (Charlton, ON) 0004. (Barton, AZ) 0212. (Brossell, WI) Radio Educacao Rural, Tefe, 4925 at 1006. (DeGennaro, NY) Radio Nacional, Sao Gabriele Cachoeira, 3375 at 0943. (DeGennaro, NY) Radio Marumby, Florinapolis, 9665 with religious messages at 2321. (DeGennaro, NY) Radio Rural, Santarem, 4765 with anmts at 0928. (DeGennaro, NY) Radio Educacao Rural, Campo Grande, 4755 with anmts and music at 0926. (DeGennaro, NY) Radio Difusora do Amazonas, Manaus, 4805 with time checks, commercials at 0931. (DeGennaro, NY) Radio Nacional, Macapa, 4915 with music, commercials, and call-ins at 0924. (DeGennaro, NY) Radio Caiari, Porto Velho, 4785 with music and anmts at 0931. (DeGennaro, NY) Radio Brazil Central, Goiania, 11815 at 0312 with music. (DeGennaro, NY) Radio Clube do Para, Belem, 4885 with local commercials at 0917. (DeGennaro, NY) Radio Cancao Nova, Cachoeira Paulista, 9675 with religious talks and music at 0007. (DeGennaro, NY) Radio Senado, Brasilia, 5990 with call-in show at 1014. (DeGennaro, NY) Radio Brazil Central, Goiania, 4985 at 0205. (DeGennaro, NY) 0206. (Brossell, WI; Jeffery, NY) 0325 and weaker//4985. (Alexander, PA) Radio Difusora Acreana, Rio Branco, 4885 with Brazilian pops at 0323. (Taylor, WI) Radio Difusora Roraima, Boa Vista, 4875 at 0945. (DeGennaro, NY) 0211. (Jeffery, NY) 0321 (Taylor, WI) Radio Congohas (p) 4775 at 0046 with Brazil pops and ballads. (Strawman, IA) Radio Clube Paranaense, Curitiba, 11935 at 1305. (Brossell, WI) Radio Guaruja, Paulista, 5045 at 0007 with pops, jingles IDs, man anncr. (D'Angelo, PA) Radio Anhanguera, Goiania, 4915 with futbol at 2348. (DeGennaro, NY) 0145 with Brazilian music. (Linonis, PA) 0329 with Brazilian pops. (Taylor, WI)

BOLIVIA—Radio Mosoj Chaski, Cochabamba, 3310 in QQ at 0939. (DeGennaro, NY) Radio Illimani, La Paz, 6025 (t) with local CP music, SS talk. Poor at 1004. (Alexander, PA) Radio San Miguel, Riberalta, 4903 with local music at 0910, SS pops, ID. (Alexander, PA) 0925 with greetings of the day and ID and into a long talk. (Montgomery, PA) Radio Fides, La Paz, 4845 with songs in SS at 0941. (DeGennaro, NY) Radio Santa Cruz, Santa Cruz, 6134.8 with local music, SS talks at 0905. (Alexander, PA) 0944. (DeGennaro, NY) Radio Pio Doce, Llallagua Sigle XX, 5952.5 at 0005 with WYFR absent SS talks, commls, jingles, anmts. Off with ID at 0231. (Alexander, PA) 0210 with talks and vocals. Off at 0230. No WYFR. (D'Angelo, PA) 1015 with news. (DeGennaro, NY)

BOTSWANA—VOA Relay, 15580 at 1801. (Charlton, ON)

BULGARIA—Radio Bulgaria, 7500 with folk music at 2138; 9500 in SS at 0139; 9700 at 2327; 11600 in RR at 1039 and 11700 in GG at 1035. (DeGennaro, NY) 9700//11700 at 2329 with music, ID and "History Club." (Burrow, WA) 11700 at 2314. (Charlton, ON) 0200. (Linonis, PA) 0220 on economic ties with Germany. (Brossell, WI)

BURKINA FASO—Radio Burkina, 5030 at 2230 with FF phone calls and bits of highlife music in between. ID and sign off anmts at 2355. (D'Angelo, PA)

CANADA—Radio Canada Int., 11755 (via Ascension) to West Africa at 2220. Also 15170 with domestic news at 2205. (DeGennaro, NY) 17800 monitored at 1230. (Northrup, MO)

CHILE—Voz Cristiana, 11745 in SS at 0009, 17680 in SS at 0056. (Charlton, ON) 11745 at 0210. (Brossell, WI) 0301. (DeGennaro, NY)

CHINA—China Radio Int., 5990/6145 via Cuba at 2304. 9570 via Cuba with news at 1307. Also 11920 in Indonesian from Xi'an at 1100. (DeGennaro, NY) 7175 via Russia at 2209 with ID after news, then into music. (Montgomery, PA) 11650 from Xi'an in RR at 1752. (Foss, Philippines) 11760 (via Cuba) at 1245 on Chinese rock bands. (Brossell, WI) 13640 at 2115. (Charlton, ON) Voice of the Strait, Fuzhou, 7280 at 0012 with CC pops. (Foss, Philippines) CPBS, Lingshi, 11925 in CC at 0028. (Foss, Philippines) China Music Jammer, 11875 over CBS-Taiwan at 1250. (Brossell, WI)

COLOMBIA—Ecos del Atrato, Quibdo, 5019 with songs, local news at 1040. (DeGennaro, NY) La Voz de tu Conciencia, Puerto Llera, 6009.8 at 0928 with SS religious messages at 0929. (DeGennaro, NY)

CLANDESTINE—Radio Nacional de la RASD (p) (to Morocco), 7460 in AA at 2039. (Montgomery, PA) 2040 with West African type music. Man shouting at 2200. (Ziegner, MA) 2122. (DeGennaro, NY) Radio Farda (to Iran) 9775 via Greece at 0205. (Brossell, WI) 21530 via Sri Lanka, in Farsi at 1300. (Paradis, ME) Democratic Voice of Burma, 9435 via Julich, at 2325 opening, Burmese vocals, woman and man with IDs. (D'Angelo, PA) 0018 with long talks in local language, partial ID around 0020, xylophone tones at 0024.

World Music Radio in Denmark is being heard by a number of DXers, including Rich D'Angelo, who got an e-mail QSL from them.

Dead air at 0027 and carrier off at 0030. (Montgomery, PA) Radio Seday-e-Melat-e-Iran, (p) 15660 with AA programming at 1448. (Strawman, IA) Radio Free Asia, 11590 via Armenia in unid language at 1216. (Brossell, WI) Radio Free Europe, 9520 via Germany in FF at 0240. (Brossell, WI)

CROATIA—Voice of Croatia, 6165 in Croatian at 2058 sign on, ID at 2100. Also 13830 in unid language with jazz at 1028. (DeGennaro, NY) 9925 via Germany, with news sports, ID at 2218. (Burrow, WA) 2334 in Croatian talking about Internet connections. (Charlton, ON) 0200 with ID, website info and into Croatian. (Linonis, PA)

CUBA—Radio Havana Cuba, 6000 at 1135 and 9550 at 1330 with "Radio Cronica." (Northrup, MO) 11760 in SS at 0011. (Charlton, ON) 11800 in SS closing at 1457, 12000 in SS at 1450 and 15120 in SS at 2158. (DeGennaro, NY) 15230 in SS at 2041. (Jeffery, NY) Radio Rebelde, 5025 with news, sports scores, weather at 1035. (DeGennaro, NY) 11655 in SS at 1250. (Brossell, WI) 1630. 9Barton, AZ)

CYPRUS—BBC Relay, 9410 at 0013 and 21660 at 1656. (Charlton, ON) 15565 with "News World" heard at 1205. (Northrup, MO)

CZECH REPUBLIC—Radio Prague, 7345 at 0313 with ID and into mail program. (Brossell, WI) 9440 in Czech at 2350, 9880 in GG to Western Europe at 1007, 11615 in Czech at 1134. (DeGennaro, NY) 7345/9870 at 0300 with IS, ID and into news. (Burrow, WA) 9440 at 0000. (Charlton, ON)

DENMARK—World Music Radio, 5815 at 2215 with Euro-pops and "WMR" jingles. (Alexander, PA) 2342. (DeGennaro, NY) 0002 with rock, multi-lingual IDs. (D'Angelo, PA)

ECUADOR—HCJB, 6050 in SS at 0313 and 11920//12020 in PP to Brazil at 0017/0025. (DeGennaro, NY) 0015. (Charlton, ON) Radio Oriental, Tena, 4782 at 1035 with SS anmts, commls, ID, local music, DJ. (Alexander, PA) Radio El Buen Pastor, Saraguro, 4815 at 1015 "...programa en la iglesia..proxima programa...las palabras de dios." (Wilkner, FL) La Voz del Napo, Tena, 3279 with religious message in SS at 1006. (DeGennaro, NY) Radio Quito, 4919 in SS at 1025. (DeGennaro, NY)

EGYPT—Radio Cairo/Egyptian Radio, 11725 at 2308 with music, time pips, ID, anthem, into news. (Burrow, WA) 0017 in EE and 12050 in AA at 1829. (Charlton, ON) 12050 in AA at 1511. (DeGennaro, NY)

ENGLAND—BBC, 6030 via Oman at 2011 in AA. 9410 via Cyprus in EE at 2140, 12095 to Europe at 1455, 13660 in AA to North Africa at 1516 and 15400 via Ascension to West Africa at 2130. (DeGennaro, NY) 13580 in Farsi at 1716. (Ziegner, MA) 15400 at 2226, 17830 at 1745 and 21470 at 1826—all via Ascension. (Charlton, ON) Bible Voice, 15715 with religious program in EE at 1607. Off at 1615. (Foss, Philippines)

EQUATORIAL GUINEA—Radio Nacional, Malabo, 6250.3 at 2155 in SS with Afro pops, time signals at 2259, national anthem and off at 2301. (Alexander, PA) Radio Africa, 15185 at 2018 in unid language. (Jeffery, NY)

ETHIOPIA—Radio Ethiopia, 7110 at 1934 with dance, pop/rock, woman in unid language, possible anthem at 1958 and off at 2000. (Foss, Philippines) 9704.2 at 0258 with ID, man with ID, 3 gongs at 0300, brief talk in Amharic, local music, news at 0330. (D'Angelo, PA)

FINLAND—YLE/Radio Finland, 11955 in Finnish at 1041 with a drama. (DeGennaro, NY) 13655 in Finnish at 1210, //15400. (DeGennaro, NY)

FRANCE—Radio France Int., 5960 in SS at 2004, 6175 in FF to Africa at 2102, 11845 in FF to Africa at 1048. (DeGennaro, NY) 9830 (*listed via Japan—gld*) in SS with at 1000. (DeGennaro, NY) 11600 (*listed via Xi'an, China—gld*) in unid Asian language at 1247. (Brossell, WI) 11615 in FF at 1700. (Paradis, ME) 15520 in FF at 1230. (Northrup, MO) 17605 in EE at 1710 and 17820 in FF heard at 1435. (Charlton, ON)

FRENCH GUIANA—RFI Relay, 15515 in FF at 1235 and 17860 in SS at 1215. (Northrup, MO) 17630 in SS at 2100. (DeGennaro, NY)

GABON—Africa Number One, 9580 in FF heard at 2216. (DeGennaro, NY) 17630 with phone calls in FF heard at 1540. (Charlton, ON)

GERMANY—Deutsche Welle, 7130 at 2030. (Paradis, ME) 9640 via Canada in GG at 0020, 11960 via Antigua in GG at 0015, (Charlton, ON) 9900 via Irkutsk, Russia in GG to Southeast Asia at 1001. (DeGennaro, NY) 11690 via Canada in GG at 2230. (MacKenzie, CA) Universal Life, 15675 in EE at 1825. (Charlton, ON) Pan American Broadcasting, 15605 with hymns at 1442. (Charlton, ON) Bible voice, 13810 in unid language at 1712. (Foss, Philippines) Adventist World Radio, 15175 in FF at 1008. (Jeffery, NY) Deutschlandfunk, 6190 at 2257 with EE pops, ID, news in GG. Poor under Brazil. (D'Angelo, PA) Deutschland Radio, 6005 in GG at 2331. (DeGennaro, NY) Bayerischerundfunk, 6085 in GG with European news heard monitored at 2019. (DeGennaro, NY)

GREECE—Voice of Greece, 5865 in Greek at 2345, 7475 with Greek theater excerpts at 2132, 9420 to Australia at 2152, 12105 at 1517 and 17705 via Delano at 2057. (DeGennaro, NY) 9420 in Greek at 0234. (Brossell, WI) 0046 in GG and 17705 Delano in Greek at 1825. (Charlton, ON) 15630 at 1440. (Northrup, MO)

GUAM—Trans World Radio, 12130 in CC at 1307. (Brossell, WI) AFN/AFRTS, 5765u at 1027 with pop/rock. (Foss, Philippines) Adventist World Radio, 11875 with news and religion at 1632. (Burrow, WA) 15235 with ID, UK address at 1529. (Charlton, ON)

GUATEMALA—Radio Buenas Nuevas, 4779.8 at 0200 with SS religious programming, closing anmts at 0244 with ID, music and off. (Alexander, PA) 0211. (Brossell, WI) Radio Cultural, Coatan, 4780 at 1030 with pops. ID at 1102. (Barton, AZ) 1031 with music and man annc r. (Jeffery, NY) Noted at 1037 sign on and also at 0152 when it was not as good. (Alexander, PA) 0202. (Brossell, WI) Radio Verdad, 4052.5 at 0033 with organ music, address. (Montgomery, PA) 0246 with non-stop easy listening music, ID at 0302. (D'Angelo, PA) (*Lately being noted around 4700.—gld*)

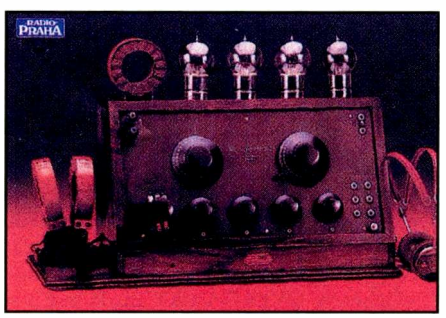
HAWAII—KWHR, 9930 with religious songs at 1205. (Brossell, WI)

HONDURAS—Radio Luz y Vida, 3250 at 0015 with religious song, woman annc r in SS. (Montgomery, PA)

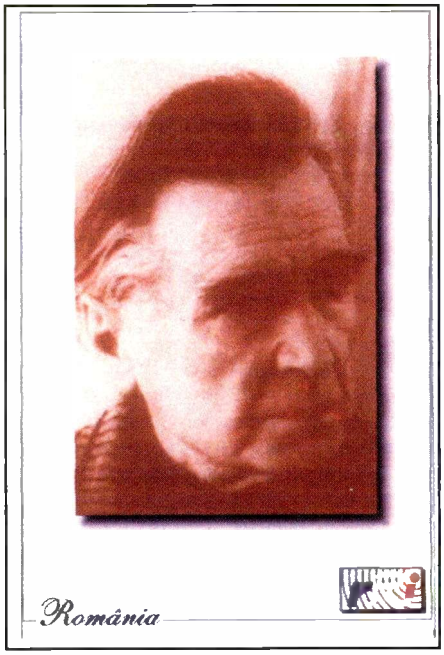
HUNGARY—Radio Budapest, 6025 with ID in EE and FF at 2000 and FF continued. Also 9800 in HH at 0045. (DeGennaro, NY) 9590 with EE news at 0120. (Charlton, ON) 9790 with economic discussion at 0240, mixing with Radio France Int. at 0258. (Burrow, WA)

ICELAND—Iceland State Broadcasting Service, 15775 in Icelandic at 1430. (Paradis, ME) AFN/AFRTS, 9980u at 0150 on bargain hunting in various countries. (Brossell, WI)

INDIA—All India Radio, Chennai, 5010 (not Thiruvananthapruam?—gld) at 0046 with Indian music, man/woman talks in apparent Hindi. Also 7410 (*Delhi—gld*) in possible EE and local music at 204–2100. (Montgomery, PA) 9445-Bangalore at 2100 with news, commentary, music. (Paradis, ME) 2159 with ID, news. (DeGennaro, NY) 10330 with music and anmts in presumed



This Czech-manufactured radio from mid the 1920s is featured on one of Radio Prague's QSLs. (Thanks Robert Charlton, ON)



Radio Romania International has a series of QSLs featuring personalities of Romanian culture. This one shows Emil Cioran, "Romanian French thinker and writer" (Thanks Robert Charlton, ON)

Hindi at 0235. (Brossell, WI) 11715-Delhi in EE at 2214. (Charlton, ON)

INDONESIA—RPDT2 Manggarai (p) 2960 at 1236 but only snippets of audio. (Strawman, IA) Voice of Indonesia, 15150 at 1645 with elevator music, EE ID, web URL, AA anmts into SS service with news on the hour. (Strawman, IA)

IRAN—Voice of the Islamic Republic of Iran, 9635//11650 in EE at 1530 with IS, music, weak talk, news and ID at 1550. (Burrow, WA) 9905 in SS at 0220 with talks, frequencies, target areas, URL and ID "Aqui Tehran, capitol de la Republica de Iran" and into Koran. (Brossell, WI) 9905 in AA at 0109 and 15150 in AA at 1458. (Charlton, ON) 11860 in Farsi at 0317. (DeGennaro, NY)

ISRAEL—Kol Israel, 11585 with news in HH at 0200. (Brossell, WI) 11605 in HH at 2210. (DeGennaro, NY) 15640 at 1721 in II to Europe and 1705 17535 in FF (Charlton, ON) 17735 in HH at 1300. (Paradis, ME)

ITALY—RAI Int., 9690 in Greek at 1429, 9840 in to South America at 2345, 11800 in II at 0309, 11880 with futbol in II at 1835 and 11920 via Singapore to 1059 close. (DeGennaro, NY) 11800 in II at 2245. (MacKenzie, CA) 0020 in II with IS at 0050. (Charlton, ON)

JAPAN—Radio Japan/NHK, 5960 via Canada in JJ at 0245, 6115 via UK in JJ to Europe at 2251, 9530 via French Guiana in JJ at 0924 and 12045 via Singapore in JJ at 1507. (DeGennaro, NY) 6145 via Canada in EE at 0007 and 11895 via French Guiana in JJ at 2233. (Charlton, ON) 15565 via French Guiana in PP at 0230. (Brossell, WI) 21630 via Ascension in JJ at 1550. (Brossell, WI)

JORDAN—Radio Jordan, 11690 at 1325 with EE pop, time pips and news at 1400. A lot of U.S. and Euro pop, news again at 1600. (Alexander, PA) 1553 with EE vocals to ID and local time check (7 p.m.) at 1600. (D'Angelo, PA) 1618 with international news and "96.3 FM" ID. Off abruptly at 1630. (Burrow, WA) 11810 in AA monitored at 1330. (Paradis, ME)

KUWAIT—Radio Kuwait, 9855 in AA at 2351 and 11675 in AA at 0256. (DeGennaro, NY) 11675//15495 at 0206 with Koran. (Brossell, WI) 15495 in AA heard at 1245. (Northrup, MO) 2315 (Barton, AZ)

LIBERIA—ELWA, 4760 at 2230 with local religious programming. Closing anmts and off after national anthem at 2301. (Alexander, PA)

LIBYA—Radio Jamahiriya/Voice of Africa, 15205 at 1928 with EE news, //15315 under Radio Netherlands. Also 1208 on 17695. (Alexander, PA) (*Both via France—gld*) 15205 via France in AA at 1828 and 17635 via France at 1715. (Charlton, ON)

LITHUANIA—Radio Vilnius, 9875 monitored at 2339 with "You are listening to Radio Vilnius" and giving frequencies. (Charlton, ON) 2359 with sign off and ID. (DeGennaro, NY)

MADAGASCAR—Radio Nationale Malagasy, 5010 from 0255 sign on with instrumental music and choral national anthem. Opening ID at 0300 and talking Malagasy language. Marching band music, female vocal, and woman anncr. (D'Angelo, PA) Radio Netherlands Relay, 9895 in SS at 0223. (Brossell, WI)

MALAYSIA—Radio Malaysia, 7295 at 1438 with music dedication program with yelling DJ. (Burrow, WA)

MALI—Radio Mali, (t) 4782.8 at 2358 with female vocal, National Anthem at 0001, off at 0002. (Montgomery, PA)

MAURITANIA—Radio Mauritanie, 4845 at 2320 with conversations in AA. (DeGennaro, NY) 0120 in AA with talk and music. Running 24 hours during Ramadan. (D'Angelo, PA)

MEXICO—Radio Educacion, 6185 with operatic music at 0948. (DeGennaro, NY)

MONGOLIA—Voice of Mongolia, 12085 in CC at 1047. Into EE at 1100 with interview of a Canadian teacher. QRM from Radio Australia. (Ziegner, MA)

MOROCCO—RTV Marocaine, 15345 with AA at 1825. (Ziegner, MA) 1835. (Charlton, ON) 2123. (DeGennaro, NY) Radio Medi Un, 9575 in AA with interview at 2210. (DeGennaro, NY) 0030 in AA/FF with Moroccan music (Linonis, PA) 0243 with AA talks and music. (Brossell, WI) VOA Relay, 15445 with "Nighttime Africa" at 2000. (Paradis, ME)

MYANMAR (Burma)—Myanmar Radio, 5040.4 at 1105 with indigenous music, 1121woman talk in local language (Wilkner, FL) 5985.8 in apparent EE with music and occasional talk. Under splatter until 1500 but very weak by 1600 close. (Burrow, WA)

NEW ZEALAND—Radio New Zealand Int., 9885 at 0851 with music, ID, news. (Jeffery, NY) 9885 at 0926 with call-in program and 11675 with talk on Bosnia at 1138. (DeGennaro, NY) 15720 with live sports at 0304. (Brossell, WI) 0420. (Burrow, WA) 17675 reading a novel at 2254. (Foss, Philippines)

NIGERIA—Voice of Nigeria, 15120 with program about families at 1945 (Jeffrey, NY) 1130 with news and 1835 under strong unid station which signed off at 1859 leaving VON in the clear. (Alexander, PA)

NETHERLANDS—Radio Netherlands, 13700 with news in DD heard at 1012. (DeGennaro, NY)

NETHERLANDS ANTILLES—Radio Netherlands, 9845 at 0015. (Charlton, ON)

NORTH KOREA—Voice of Korea, 9650 in JJ at 2223. (DeGennaro, NY) 11710 //13760 with IS, ID, anthem, at 1300. (Brossell, WI) 11845//15230 at 0238 acclaiming Kim Jung Il. (Burrow, WA) 13760//15180 at 0018 in SS. (Barton, AZ) Korean Central Broadcasting Station, Kanggye, 6100 with woman's chorus at 1732. (Foss, Philippines) 1168-Pyongyang, at 1220 with impassioned talks in KK. (Brossell, WI) Hamyong PBS, 3220 with large chorus and orchestra at 2017. (Foss, Philippines)

NORTHERN MARIANAS—KFBS, 11580 in CC at 1245. (Brossell, WI) VOA Relay, 11990 in CC at 1225. (Brossell, WI)

PAKISTAN—Radio Pakistan, 11570// 15100 at 1600 with time pips, ID, news. (Burrow, WA)

PAPUA NEW GUINEA—NBC, Port Moresby, 4890 at 0924 with local environmental and health reports. (Burrow, WA) 1000 in EE and Pidgin with BBC news, followed by local news. (Linonis, PA) Radio East New Britain, Rabaul, 3385 at 0835 with man anncr in long talk segments. (Montgomery, PA) 1044 with man anncr in Pidgin and EE and island vocals. (D'Angelo, PA) Radio East Sepik, Wewak, 3335 at 1052 with continuous music, ID by woman at 1101 and man with EE news. (D'Angelo, PA) Radio New Ireland, Kavieng, (t) 3905 at 0851 with woman talks. Ham QRM made reception difficult. (Montgomery, PA) 1051 with island vocals. News at 1100 including "This news is coming to you from Radio New Ireland" and upcoming local events. (D'Angelo, PA) Radio Central, Port Moresby, 3290 at 0935 with religious program. (DeGennaro, NY) Catholic Radio Network, Port Moresby, 4960 at 1123 with religious message, short messages, program from Vatican Radio. (Burrow, WA)

PARAGUAY—Radio Nacional, 9737 with music, SS commercials, ID 0924. (DeGennaro, NY)

PERU—(all in SS) Radio Madre de Dios, Puerto Maldanado, 4950 with contemporary Christian music at 0331. (Taylor, WI) Radio Municipal, Panao, (t). 3172.7 at 0925 with OA music, man anncr, very weak. (Montgomery, PA) 1020 with flutes, time check, ID. (Wilkner, FL) La Voz de la Selva, Iquitos,

Radio Clube Paranaense, Curitiba, is one of the more reliable Brazilians in the QSL department. (Thanks Rich D'Angelo)

4824.4 at 1025. (DeGennaro, NY) Radio Santa Maria, Cusco, 4965 at 0955 with music and talk. (DeGennaro, NY) Radio La Oroya, La Oroya, 4904.7 with interviews on drug trafficking at 0950. (DeGennaro, NY) Radio Sicuani, Sicuani, 4826 with music at 1021. (DeGennaro, NY) Radio Huanta 2000, Huanta, 4748 at 0949. (DeGennaro, NY) Radio Horizonte, Chachapoya, 5019.9 with music and talk at 1037. (DeGennaro, NY) 0002 with vocals, man anncr, IDs and TCs. (D'Angelo, PA) 0110 with religious programming. Off at 0133 after national anthem. Splatter from Cuba on 5025. (Alexander, PA) Radio La Hora, Cusco, 4856.1v at 1005 with talk, ID, OA music. Drifted down to 4855.9 by 1015. (Alexander, PA) Radio Tarma, Tarma, 4775 with music at 1013. (DeGennaro, NY) Radio Cultural Amauta, Huanta, 4955 at 0958 with sign on routine, ID at 1005. (DeGennaro, NY) Radio Ancash, Huaraz, 4992 at 0929. (DeGennaro, NY) Reina de la Selva, Chachapoyas, 5486.6 at 1025 with local anmts, time checks, music. (DeGennaro, NY) Radio Melodia, Arequipa, 5939.3 at 0915 with continuous talk, ad string, ID. Also heard at 0410. (Alexander, PA) Radio Oriente, Yurimaguas, 6188 at 1040 with DJ chatter, canned ID, ad string. (Alexander, PA) Radiodifusora Huancabamba, Huancabamba, 6536.1 with OA music, talk, off abruptly at 0201. (Alexander, PA) Radio del Pacifico, 4975 with music and talk at 1007. (DeGennaro, NY) Radio Maranon, Jaen, 4835.5 at 1025 with talk, OA music, canned ID, ad string. (Alexander, PA)

PHILIPPINES—VOA Relay, 7215 with world news at 0007. (Foss, Philippines) 6160 with sports at 1220. (Northrup, MO) 9620 at 2220 in Indonesian with EE sound bits. (D'Angelo, PA) 11805 in II at 2248. (MacKenzie, CA) 11825 in CC at 1223. (Brossell, WI)

PIRATES—James Bond Radio, 6925 at 2245 with blues and rock. Only ID was "Bond, James Bond" after every song or two. (Balint, OH) JR Radio, Ireland, 6240.2 at 0020 with ID and e-mail address (JR_Radio@hotmail.com) and postal address of P.O. Box 39, Waterford, Ireland. Mostly Irish ballads. Clear ID as "JR Radio International" at 0040. (Montgomery, PA) Jolly Roger Radio, 0038 with mix of rock and chatter, maybe phone calls. (Strawman, IA) Tangerine Radio, 6925 at 0237 with "This is the anti-religion show coming to you on Tangerine Radio." (Brossell, WI) Mystery Radio, Germany, 6220 at 2320 with man anncr, woman with several IDs, mostly pop tunes. (Montgomery, PA) The Crooked Man, 6925.5 at 2302 with guy talking about how he became insane because of the Holy Ghost and the fact that he is Jimmy Hoffa's adopted son, many classic rock selections and ID "The Crooked Man is Calling" but no address given. It has been more than a decade since I've heard a whole program from this station. (Zeller, OH) Undercover Radio, 6925. Intermittently from 2103 to 2339 with carrier off and on many times. Early on there was nothing but rock, later rock, new age and jazz. At one point a female standup comic doing her routine over inst. music. Often including "broadcasting from the middle of nowhere" as part of their ID. (Zeller, OH) Hour of Slack, 6925.5 at 0017 appeared to be a rebroadcast of Ivan Stang's "Hour of Slack" program from the Church of the Subgenius, which runs regularly on local college radio in Cleveland. Stang is responsible for the "Bob" cartoon character who looks like Ward Cleaver with a pipe. A parody of religion. No address announced. (Zeller, OH) European Music Radio, via Latvia, 9290 at 2138 with plenty of IDs, postal and e-mail addresses and phone number. (D'Angelo, PA)

POLAND—Radio Polonia, 7340 at 2106 in Polish with woman anncr and music to 2110. (Montgomery, PA)

PORTUGAL—9715 with PP songs at 0045. (Charlton, ON) 11850 at 0008 in PP with talk on children's schooling in China. 15480 in PP at 2343. Also 15665 in PP at 2349 and 17575 in PP at 2107. (DeGennaro, NY) 21830 in unid language playing pops. (Paradis, ME)

ROMANIA—Radio Romania Int., 0590 at 2337. (Charlton, ON) 0100. Also 9760 in SS at 0950, 11730 in Romanian at 2216, 11940 in EE at 1840 and 11970 in SS at 0322. (DeGennaro, NY) 11820 with IS, ID, schedule at 0400. (Burrow, WA) 15380 in unid Slavic language at 1800. (Barton, AZ)

RUSSIA—Voice of Russia, 6145 from Moscow with 2025 sign off, 12055 from Samara at 1514 and 15455 from Armavir in GG at 0940. (DeGennaro, NY) 9965 via Armenia in SS at 0227. (Brossell, WI) 11825 via Vatican at 0115. (Barton, AZ) Radio Tikhy Okean, 9480 in RR at 0645 with several IDs. (Barton, AZ) (*This was said to be a temporary use, perhaps to be expanded in the future.—gld*)

RWANDA—Deutsche Welle Relay, 15275 with talks in GG heard at 0150. (Brossell, WI)

SAO TOME—VOA Relay, 11975 at 2100. (Paradis, ME)

SAUDI ARABIA—BSKSA, 9555 in AA at 2207. (DeGennaro, NY) 15170 with Koran at 0318. (Brossell, WI) 15345 in AA at 1848. (Charlton, ON) 15435 in AA at 1636. (Ziegner, MA) 21505 in AA heard at 1230. (Paradis, ME)

SERBIA-MONTENEGRO—Int. Radio of S&M, 9580 at 0006. (Charlton, ON) 0001 and 11800 in AA at 1439

SEYCHELLES—BBC Relay, 21470 at 1400. (Linonis, PA)

SINGAPORE—Mediacorp Radio, 6150 at 1434 with news ending, commercials, PSAs, ID as "News Radio 9-3-8—a station of Mediacorp Radio." (Burrow, WA) BBC Relay, 9740 at 1109 with "Play of the Week." (Jeffery, NY) 15285 with ID and into CC at 1300. (Brossell, WI)

SLOVAKIA—Radio Slovakia Int., 11600 in SS with ID and contact info at 1442. (DeGennaro, NY)

SOUTH AFRICA—Channel Africa, 15265 at 1737 with cultural feature. (Charlton, ON) Radio Sondergense, 3320 in Afrikaans at 0310. (Taylor, WI) BBC Relay, 15420 at 1800. (Paradis, ME)

SOUTH KOREA—Radio Korea Int., 11795 with news in SS at 1045. (DeGennaro, NY) 11810 heard at 0246 with cultural report, ID and sked. (Burrow, WA)

SPAIN—Radio Exterior de Espana, 6055 in SS at 0435. (Mackenzie, CA) 9570//15290 with news in SS, ID at 2015. (Burrow, WA) 9660 in SS at 1000. (Barton, AZ) 13720 in SS at 1016, 15110 in SS at 2155, 15290 in EE at 2032 and 15385 in FF at 2321. (DeGennaro, NY) 15385 in EE at 0010 and 21610 in AA at 1807. (Charlton, ON) 15585 in SS at1215. (Northrup, MO)

SRI LANKA—SLBC, 9770 with ID at 0030 and 15745 at 1555 with female pop vocals. (Charlton, ON) VOA Relay, 13685 with "New Dynamic English" at 1912. (Foss, Philippines) 15240 with an interview at 1237. (Brossell, WI)

SUDAN—Radio Peace, 4750 with sudden sign on at 0228. Man with ID and frequency anmt, brief choir vocals and EE religious program. (D'Angelo, PA)

SURINAME—Radio Apinte, 4990 at 0235 with pop vocals, man anncr with mainly DD talk. (D'Angelo, PA) 4991 in DD at 0202. (DeGennaro, NY)

SWEDEN—Radio Sweden, 15240 with talk about Tony Blair at 1335. (Charlton, ON)

TAIWAN—Radio Taiwan Int., 9610 in CC at 2206. Seemingly jammed by the Chinese Music Jammer. (D'Angelo, PA) 11605 at 1127 in JJ to Japan. (DeGennaro, NY) In CC at 1245 (Brossell, WI) 11930 in CC at 0020. (Charlton, ON)

TAJIKISTAN—Voice of Russia relay,

11500 in listed Hindi at 1218. (Brossell, WI) Tentative in unid language heard at 1400. (Linonis, PA)

TANZANIA-ZANZIBAR—Radio Tanzania-Zanzibar, 6015 in Swahili or AA at 0306. (DeGennaro, NY)

THAILAND—Radio Thailand, 9680 on investment opportunities in Thailand at 2030. (Linonis, PA) VOA Relay, 11785 in CC at 1257. (Brossell, WI) BBC Relay, 17760 at 1255. (Brossell, WI)

TUNISIA—RTT Tunisienne, 7225 in AA at 2113, 11730 in AA to Europe at 1448, 12005 in AA at 0325. (DeGennaro, NY) 15450 in AA at 1205. (Northrup, MO)

TURKEY—Voice of Turkey, 9460 in TT at 2354 and 13770 in TT at 1018. (DeGennaro, NY) 9460 at 0236. (Brossell, WI) 9460 in TT at 0018, 9830 in EE at 2216 and 9785 in EE at 1831. (Charlton, ON) 9785 in EE at 1903, talk with occasional music, IDs and sked at 1918, IS and off at 1920. (Burrow, WA) 15350 in TT at 1400. (Ziegner, MA)

UGANDA—Radio Uganda, 4976 heard at 0338 with DJ taking requests. (Taylor, WI)

UKRAINE—Radio Ukraine Int., 7545 on Ukrainian culture at 0025. (Charlton, ON) 0043 with features, ID at 0044. (Burrow, WA)

UNITED ARAB EMIRATES—Emirates Radio, Dubai, 15395 in AA at 1620. (Charlton, ON) 15400 in AA at 0205. (Brossell, WI)

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 **Jack Linonis** in **Hermitage, Pennsylvania**. Jack gets a copy of the new 2005 *Passport to World Band Radio*, courtesy of Universal Radio, a veritable candy store for radio nuts. You should sport a copy of their latest catalog in your shack. If you're not on their mailing list, just give them a call at 614-866-4267, e-mail them at dx@universal-radio.com, or drop a note to Universal at 6830 Americana Parkway, Reynoldsburg, OH 43068.

UNITED STATES—AFN/AFRTS, Florida, 5446.5u with ball game at 2333. (DeGennaro, NY)

UZBEKISTAN—RadioTashkent, 9715 in Uzbek at 0106. (Charlton, ON) 15295 at 1200 sign on with IS, ID, EE news //17775, which was weak. Same two frequencies at 1330 sign on with IS, ID, EE news. (Alexander, PA)

VATICAN—Vatican Radio, 7335 with CHU off, at 0310 with Ukrainian program, ID and IS at 0320 and into Byelorussia program. (D'Angelo, PA) 9600 in CC to Asia at 2219. (DeGennaro, NY) 15235 in II at 1525 with IS and ID. Also 15745 in II at 1502. (Charlton, ON) 15595 in II at 1200. (Northrup, MO)

VIETNAM—Voice of Vietnam, 6175 via Canada with long talk in VV. (MacKenzie, CA) 9840 in E at 1508. (Burrow, WA)

VENEZUELA—Radio Nacional, 9820 via Cuba in SS at 2337. (DeGennaro, NY) 11760 via Cuba in SS at 2300. (Linonis, PA) 13680 via Cuba in SS at 2337. (Charlton, ON) Radio Amazonas, Puerto Ayacucho, 4939.7 at 0931 sign on in SS. (Alexander, PA) 1002 with songs, ID. (DeGennaro, NY)

ZAMBIA—The Voice, 4965 at 0230 with IS, ID and into presumed Swahili. (Linonis, PA) 0334 with EE pops, woman anncr. (Taylor, WI) Radio Zambia/ZBC, 4910 at 0245 with fish eagle IS to choral anthem at 0250, then man with ID and sign on anmts in local language. EE ID and talk around 0315. (D'Angelo, PA) 0325 with man and two women talking laughing. (Taylor, WI)

ZIMBABWE—Trans World Radio, 3240 with talks in Shona language at 0305. (Taylor, WI) ZBC, 3306 with high-life music at 0115. (Strawman, IA) Weak audio at 0005 with African music. (Montgomery, PA)

And the file is closed again. Aim a mighty roar of approval at the fine folks who supplied the great list of loggings for this round: Bruce Burrow, Snoqualmie, WA; Brian Alexander, Mechanicsburg, PA; Tricia Ziegner, Waterford, MA; Jerry Strawman, Des Moines, IA; Dave Jeffery, Niagara Falls, NY; Stewart MacKenzie, Huntington Beach, CA; Rick Barton, Phoenix, AZ; Robert Chandler, Windsor, ON; Robert Wilkner, Pompano Beach, FL; Dave Balint, Wooster, OH; Ray Paradis, Pittsfield, ME; Rich D'Angelo, Wyomissing, PA; Robert Montgomery, Levittown, PA; Jack Linonis, Hermitage, PA; Marty Foss, Guinayangan, Philippines; Mark Northrup, Gladstone, MO; Ciro DeGennaro, Feura Bush, NY, and George Zeller, Cleveland, OH. Thanks to each of you! And until next month—good listening!

Popular Communications February 2005 Survey Questions

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Yes 16
No 17

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Yes 18
No 19

I would purchase a Best Of Alice Brannigan or Best Of Shannon Huniwell book if it were available.

Yes 20
No 21

During the past 12 months I've used a CB radio:

Never 22
Once or twice 23
Three or four times 24
Several times daily 25
Only about once a week 26
About once a month 27

by Mike Byer, AF4AY, wcu02mpa@hotmail.com

Emergency, Calling, And Common Frequencies

In April 1912 an event happened that changed the course of history, not only within the shipping industry, but also within the area of maritime communications. The *RMS Titanic* was en route from England to the United States, traveling in an area that was reported to have icebergs. We all know what happened on the fateful night of April 14. The tragedy is that the rescue could have been much more successful, or the accident altogether avoided, had specific radio communications procedures been mandated at sea.

In the aftermath of the *Titanic* disaster, the SOLAS (Safety Of Life At Sea) conventions were adopted, and this has been regarded as one of the most important acts ever created to govern merchant shipping. SOLAS put measures in place that included an around-the-clock watch of the 500-kHz radio frequency and has helped save lives throughout the world. The concept of designating emergency and calling frequencies has spread into aviation, ham radio, the military, law enforcement, fire control, search and rescue, CB, GMRS, and so many other areas that I think it's worth taking an in-depth look. So this month I'm going to look at various emergency and calling frequencies of the global maritime distress and safety system, digital selective calling (DCS), the National Law Enforcement Emergency Channel (155.475), and many other formal and informal channels and frequencies to You can listen for these on your scanner, and maybe even use a few of the channels if you find yourself in a situation that warrants it.

The Early Years

During the early years of wireless communications, there was little or no requirement regarding maritime communications. If a ship was in trouble, the three-letter combination of CQD was broadcast via Morse code on a radio device known as a spark gap transmitter. These radio devices were unlike anything in use today. Large, cumbersome, and of only marginal receive quality, the radio sets could only send and receive Morse code (CW). Not until the invention of the audion tube did radio communications take a real turn for the better.

In the same year as the *Titanic* disaster, Edwin Armstrong and Lee Deforest were developing the regenerative receiver design of radios. This basic design, which is still in use today, allowed for other forms of modulation to be used on the airwaves. Eventually a human voice could be delivered from one place to another without wires. But prior to that, the old spark gap transmitters were the order of the day. CW was the only method of communicating, and ship radio operators were stationed in their radio rooms as the schedule demanded. Believe it or not, 24-hour radio watches were not required back then. The radio operator would just shut the system down and go to bed. Had the 24-hour radio watch been mandated back then, help would have reached the *Titanic* much sooner than it did. Another ship, the *California*, was only 30 minutes away but the radio operator had gone to bed shortly before the doomed ship struck the iceberg. Instead, the *Carpathia* had to steam at full speed to arrive four hours *after* the initial distress call went out. Unfortunately, the *Titanic* only had two hours of life afloat after the impact.

Fixing The Problem

After a review of the communication procedures used that night, it was apparent that maritime communications needed a drastic overhaul. The SOLAS convention provided just that. Along with a host of other issues, radio at sea became a top priority and the face of the maritime industry would change forever. For one thing, a standardized frequency was set in place: 500 kHz became the first emergency calling frequency, as we know it. The familiar SOS, although adopted in 1912 at the International Radiotelegraphic Convention in London, was not *mandated* for use, just suggested, and the letters CQD (CQ distress) were still in use. SOS soon became mandated as the emergency distress call. The SOLAS convention was fully implemented in the 1920s.

Capture it all with the new Uniden BC246T compact handheld scanner, but in your zeal to program any and all frequencies, don't forget the basics; 156.80 MHz and others are often a wealth of information.

The legislation that accompanied these procedures was badly needed. Throughout the world, maritime traffic was rapidly increasing, for commercial ventures, military use, and pleasure. All ships needed to be on the same proverbial page when it came to communicating with one another, as well as with land stations that were designated to send and receive messages. As time passed and radio developed into both voice and CW modes, other forms of two-way radio communications were developing and being used for security, aviation, military, and amateur radio. As all these services grew, so did the need to regulate who could speak where, who could communicate with whom, and who had precedence over given areas of the radio spectrum. Regulations were put into place regarding radio watch and equipment requirements for vessels. Certain vessels were voluntarily equipped, while others were mandated to have certain radio procedures in place (compulsory equipped). Vessel tonnage, number of passengers, international voyages, and various other factors dictated precisely what radio procedures each vessel had to follow.

Hurricane damage and destruction isn't limited to coastal areas. After torrential downpours, rivers and streams overflow, but if you know where to listen you're one step ahead—and a whole lot safer than you would be without a radio!

During and following World War II a method of communicating between vessels at relatively close range developed on the VHF marine band, which was known as *talk between ships/TSB*. As radio technology grew, so did the VHF marine band.

Channel 16

Today, one of the most important frequencies in the world is 156.800 MHz. This frequency is also known as Channel 16 on marine radios and is probably listened to more than *any* other frequency. Countless lives have been saved due to the watch procedures that have been legislated as well as the voluntary listening by small commercial ships and pleasure boats. Whenever I travel near a large body of water or the ocean, I make sure my scanner travels with me. I set it for scanning the marine radio band, and the amount of information passed to and from vessels and the U.S. Coast Guard never fails to amaze me.

Radio operators usually call the Coast Guard on Channel 16 but then quickly change over to channel 22 or 157.100 MHz. Valuable information is routinely passed regarding distressed or overdue vessels, waterway obstructions, large oceangoing ship departures, and a host of other items that every mariner needs to know. Listening to the scanner near the waterfront is a great way to know what's happening on the waters near you.

Other Calling/Emergency Channels

Calling/emergency channels are not limited to the VHF marine band, however, but are used by numerous other radio services. Many channels/frequencies are formal and some are informal, as they have not been designated "calling" channels by the FCC. Various law enforcement, fire, CB, FRS, ham, military, HF maritime, and various other frequencies have been established as calling and/or emergency frequencies. Some frequencies have also been set aside as local and regional common channels to contact other services and agencies as needed.

Let's take a look at some of the more common, as well as lesser known, frequencies and channels to listen for and to use, should the need ever arise. Again, the first frequency to check out is **156.800 MHz.** This emergency marine VHF channel is to be used for calling other vessels and the Coast Guard as needed. Once communication has been established, it is good practice to move off to a "working" channel. For pleasure boaters this is usually Channel 68, 69, or 71. Failure to switch over in a timely manner will most likely result in a reminder from your local Coast Guard unit. Listen in on those frequencies, too. They are,

156.425 Channel 68 non-commercial
156.425 Channel 69 non-commercial
156.575 Channel 71 non-commercial

The next group of maritime frequencies will require a shortwave receiver. The frequency of **2182.0** kHz has long been the emergency and calling channel for offshore vessels. This frequency is also associated with the following high frequencies:

2.670 Coast Guard emergency and calling
4.426 Coast Guard emergency and calling
6.501 Coast Guard emergency and calling
8.764 Coast Guard emergency and calling
13.089 Coast Guard emergency and calling
17.314 Coast Guard emergency and calling
4.125 Maritime (ship) distress channel
6.215 Maritime (ship) distress channel
8.291 Maritime (ship) distress channel
12.290 Maritime (ship) distress channel
16.420 Maritime (ship) distress channel

Your distance from shore, the season, time of day, sunspot cycle, and various other factors will determine which band you should be using. It's a good idea to listen for other stations to help determine propagation conditions for your situation. The ham frequencies of **7.268, 14.300,** and **14.313 MHz** will also provide assistance. Although these frequencies are not formally monitored around the clock, it's a good bet that someone is listening somewhere. The Maritime Mobile Service Network maintains several nets and has regular net traffic on **14.300** and has been doing so since 1968. A very special thanks to all who have participated in the formal traffic nets over the past years!

The next frequencies to keep a watch on are the aviation emergency frequencies of **121.500** and **243.00 MHz**. 121.500 is the civilian frequency and 243.00 is the military equivalent. Both of these are AM, as is most aviation communications on VHF/UHF. Should you ever hear any activity on these frequencies, keep a sharp ear out as something is about to happen. These frequencies are usually only used when a real problem arises. 121.500 is used for both voice traffic and beacons. The beacons are used in a device called an EPIRB, for Electronic Position Indicating Radio Beacon (see Gordon West's "Personal Locator Beacon Update" elsewhere in this issue for more on such beacons). I'll be doing a series on GPS, emergency locator devices, and related products and their usage in an upcoming column.

Also check out **155.475 MHz**. This is known as the National Law Enforcement Emergency Channel (NLEEC). This frequency has been set aside as the nationwide emergency, calling, and interagency channel. Most law enforcement agencies have access to it, although they still need to be licensed. No matter where you live, keep this frequency in your scanner as you may hear anything from interagency chatter to routine lunch and dinner plans between officers.

Another nationwide law enforcement group of frequencies is found in the **800-MHz** band. The following frequencies are in common use nationwide:

866.0125/821.0125 Calling NPSPAC 1
866.5125/821.5125 Tactical NPSPAC 2
867.0125/822.0125 Tactical NPSPAC 3
867.5125/822.5125 Tactical NPSPAC 4
868.0125/823.0125 Tactical NPSPAC 5

The frequency **866.0125** is considered the calling channel for 800-MHz users. This frequency should be set in a non-trunking format and no PL tone should be used. The other frequencies may have the tone of 156.7 Hz, as this is the nationwide standard for the common frequencies. Other law enforcement frequencies include (in MHz):

39.580 Ohio
39.980 West Virginia
154.875 Western North Carolina VHF
155.250 Eastern North Carolina VHF
453.100 North Carolina UHF

Check your local area for any common calling or emergency channels and frequencies that your local and state law enforcement agencies may use. Let me know about them and I'll report on them here as they come in.

Critical Law Enforcement Frequency Issues!

The need for common channels in the Public Safety community is critical as different agencies will call on each other for assistance. This is especially true in rural areas where several volunteer fire departments will often join together on a call. These calls may cross not only department boundary lines, but also county and state lines for the border areas. Some areas may have the same frequency, but will use different PL tones in order to separate the calls for each department.

Many commercial radios will have a "monitor" button that will turn off the PL decode and allow the squelch to open up on a carrier signal, rather than having the PL tone open the squelch. Having all responding units make sure the monitor button is pressed allows mutual aid communications to flow smoothly. Departments that assist one another and share the same band, but not the same frequency, will most likely have a common channel for both formal and informal communications between members and departments. The real trick for agencies is when a mutual aid situation arises and one department may be on VHF and another on UHF. This problem can usually be solved by equipping one or two vehicles in each department with standard VHF or UHF radios. I've seen some fire trucks equipped with a VHF low, VHF high, and UHF radio due to the wide range of band usages in the area.

Another problem arises when law enforcement (especially in rural areas) officers are involved in a situation where the municipality may be on 800 MHz, the county agencies on VHF high band, and the Highway Patrol on VHF low band. The various law enforcement agencies may have several radios in their vehicles. Some states, like Tennessee and Indiana, have their state law enforcement vehicles adorned with numerous antennas (I counted seven antennas on a Tennessee Highway Patrol car recently, and they were beautiful!) covering much of the public safety radio spectrum. However, states such as South Carolina and Florida are on 800 MHz and you may only see one or two antennas on their vehicles. State law enforcement vehicles will often travel in numerous local jurisdictions and will want to stay in contact with their county and local fellow officers. State agencies will also establish a *common* channel between themselves. Here in North Carolina, for example, the State Bureau of Investigation shares a VHF high band system with the Wildlife Resource Commission.

155.445 North Carolina State Police, mobile extenders
155.190 North Carolina State Police, base-to-base
155.475 North Carolina State Police, Nationwide Police Channel
159.315 North Carolina S.B.I./Wildlife Resources Commission, F-1/4/7
159.345 North Carolina S.B.I./Wildlife Resources Commission, F-2/5/8
159.285 North Carolina S.B.I./Wildlife Resources Commission, F-3/6/9
151.460 North Carolina S.B.I./Wildlife Resources Commission, F-10 (simplex)
151.385 North Carolina S.B.I./Wildlife Resources Commission, F-11 (simplex)
151.325 North Carolina S.B.I./Wildlife Resources Commission, F-12 (simplex)
151.295 North Carolina S.B.I./Wildlife Resources Commission, simplex
151.175 North Carolina S.B.I./Wildlife Resources Commission, unit-to-unit
151.355 North Carolina S.B.I./Wildlife Resources Commission, unit-to-unit
151.220 North Carolina S.B.I./Wildlife Resources Commission, unit-to-unit

As an example, the North Carolina State Highway Patrol shares a system with Alcohol Law Enforcement and the North Carolina Bureau of License and Theft. The Highway Patrol uses the 42-MHz low-band system, but most vehicles

have a VHF high-band in-car repeater that also has the 155.475 frequency as well as several repeater channels.

At this time, I have not found a calling or common channel in the 42-, 44-, or 45-MHz State Law Enforcement VHF low band. The state VHF high-band repeater system is rarely used in the western part of the state, but it is used more frequently in central and eastern North Carolina. Other state agencies have these repeater channels programmed in, and the eight regional communication centers do maintain a watch on them.

Ham Radio Calling And Simplex Frequencies

The amateur radio bands also have a wide range of calling channels that are recognized throughout the United States and elsewhere. The unique thing about ham calling channels is that various modes and power levels have their own frequencies. Whether QRP (low power), AM, FM, CW, or SSB, the list can be quite large. I will give the voice frequencies for MF, HF, VHF, and UHF bands. They are as follows:

160 Meters
1.910 QRP SSB calling frequency
80 Meters
3.885 AM calling frequency
3.985 QRP SSB calling frequency
40 Meters
7.285 QRP SSB calling frequency
7.290 AM calling frequency
20 Meters:
14.285 QRP SSB calling frequency
14.286 AM calling frequency
15 Meters
21.385 QRP SSB calling frequency
10 Meters
29.600 FM simplex
29.000-29.200 AM (tune around for good catches here!)
28.495 unofficial DX calling frequency
28.425 10-10 intl calling frequency
6 Meters
50.125 MHz SSB
50.400 MHz AM
52.525 MHz FM
2 Meters
144.100 MHz CW
144.200 MHz SSB
146.520 MHz FM
1.25 Meters
222.100 MHz SSB/CW
223.500 MHz FM
70 Centimeters
432.100 MHz SSB
446.000 MHz FM
33 Centimeters
903.100 MHz SSB
906.500 MHz FM
23 Centimeters
1294.500 MHz FM
1296.100 MHz SSB/CW
13 Centimeters
2304.100 MHz CW/SSB

Mike's Tip Of The Month

When programming an EDACS 800-MHz radio system into your scanner, it is imperative to get the frequencies in the right order. This is called Logical Channel Numbering (LCN), and your scanner will not track if even one frequency is out of place. Once your scanner is properly programmed, you simply hit the scan button and let the action begin. I was able to monitor Brevard County Sheriff's Department in Florida only when I had the system 100 percent correctly entered. Another tip for monitoring these 800-MHz systems is to use an antenna that's designed for 800-MHz frequencies.

North To Alaska!

The last and final calling frequency I'll recommend now is the Alaska emergency calling frequency of 5167.5 MHz. This frequency has been established as the official emergency frequency for the state of Alaska. This frequency is to be used for emergencies and not as a calling channel to later switch to a non-working channel. If anyone out there has ever heard any radio traffic on this channel please let me know what was heard and when it took place.

Number One Priority!

The need for emergency and common calling channels will continue to be of high importance in radio communications. As more and more agencies cross over between geographic and authoritative jurisdictions, the need for agencies to communicate with one another has come to the forefront of radio technological development and federal legislation.

The APCO Project 25 (also known as simply P25) has addressed the issue of agency interoperability. Many radio systems are proprietary in nature, meaning that only one manufacturer's radios will operate on the trunking system. P25 states that agency radios must be able to operate in analog (non-trunking) mode and have 25-kHz bandwidth ability, although the current migration to 12.5 kHz bandwidth is considered the standard and P25 radios must be able to function this way as well. The P25 standard also calls for 9600-bps trunking, rather than the older 3600-bps trunking. With so many types of radio systems available, the APCO25 standard couldn't have happened sooner!

As communication technology advances and agencies upgrade, the need to keep up-to-date on what your local agencies are doing with their communication systems should be one of your highest priorities. Newer scanners can track both analog and digital trunking systems, have numerous predefined search banks, and an enormous amount of memory channels. These scanners also come with a high price, but if you take your monitoring seriously, those scanners may be your only choice. Both RadioShack and Uniden are producing scanners that will track digital systems with the 9600-bps control channels. Remember that no scanner will track an encrypted signal.

Always make sure you're buying a scanner that will primarily track the agency you need to monitor. A less expensive model just may meet your needs. Until next moth, keep your scanners tuned in and let me know what you're hearing on the calling and common channels in your area. ■

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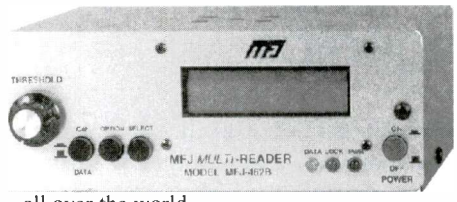

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Copies most standard shifts and speeds. Has MFJ *AutoTrak*™ Morse code speed tracking.

Use 12 VDC or use 110 VAC with MFJ-1312B AC adapter, $12.95. 5¼Wx2½Hx5¼D inches.

No Matter What™ Warranty

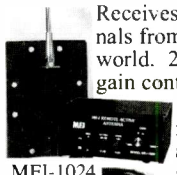
You get MFJ's famous one year *No Matter What*™ limited warranty. That means we will repair or replace your MFJ *MultiReader*™ (at our option) *no matter what* for one full year.

Try it for 30 Days

If you're not completely satisfied, simply return it within 30 days for a prompt and courteous refund (less shipping). Customer must retain dated proof-of-purchase direct from MFJ.

Super Active Antenna

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



Receives strong, clear signals from all over the world. 20 dB attenuator, gain control, ON LED. Switch two receivers and auxilary or active antenna. 6x3x5 in. Remote has 54" whip, 50 feet coax. 3x2x4 inches. 12 VDC or 110 VAC with MFJ-1312, $12.95.

MFJ-1024 **$139.95**

Indoor Active Antenna

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

MFJ-1020C **$79.95**

Tuned circuitry minimizes intermod, improves selectivity, reduces noise outside tuned band. Use as a preselector with external antenna. Covers 0.3-30 MHz. Tune, Band, Gain, On/Off/Bypass Controls. Detachable telescoping whip. 5x2x6 in. Use 9 volt battery, 9-18 VDC or 110 VAC with MFJ-1312, $12.95.

Compact Active Antenna

Plug this *compact* MFJ all band active antenna into your receiver and you'll hear strong, clear signals from all over the world, 300 KHz to 200 MHz including low, medium, shortwave and VHF bands. Detachable 20" telescoping antenna. 9V battery or 110 VAC MFJ-1312B, $12.95. 3⅛x1¼x4 in.

MFJ-1022 **$49.95**

Eliminate power line noise!

MFJ-1026 **$179.95**

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

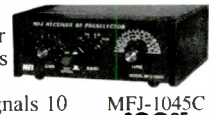
MFJ Antenna Matcher

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

MFJ-959C **$99.95**

Preamp with gain control boosts weak stations 10 times. 20 dB attenuator prevents overload. Select 2 antennas and 2 receivers. 1.6-30 MHz. 9x2x6 in. Use 9-18 VDC or 110 VAC with MFJ-1312, $12.95.

High-Gain Preselector



High-gain, high-Q receiver preseletor covers 1.8-54 MHz. Boost weak signals 10 times with low noise dual gate MOSFET. Reject out-of-band signals and images with high-Q tuned circuits. Push buttons let you select 2 antennas and 2 receivers. Dual coax and phono connectors. Use 9-18 VDC or 110 VAC with MFJ-1312, $12.95.

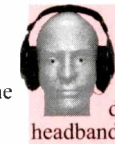
MFJ-1045C **$99.95**

Dual Tunable Audio Filter

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

MFJ-752C **$99.95**

MFJ Shortwave Headphones



MFJ-392B **$19.95** New!

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

High-Q Passive Preselector

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

MFJ-956 **$49.95**

Super Passive Preselector

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

MFJ-1046 **$99.95**

MFJ Shortwave Speaker

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

MFJ-281 **$12.95**

MFJ All Band Doublet

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

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

MFJ Antenna Switches

MFJ-1704 **$69.95**

MFJ-1702C **$24.95**

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

Morse Code Reader

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

MFJ-461 **$79.95** New!

MFJ 24/12 Hour Station Clock

MFJ-108B, $19.95. Dual 24/12 hour clock. Read UTC/local time *at-a-glance*. High-contrast 5/8" LCD, brushed aluminum frame. Batteries included. 4½Wx1Dx2H inches.

New!

Free MFJ Catalog

and Nearest Dealer . . . 800-647-1800

http://www.mfjenterprises.com

• 1 Year *No Matter What*™ warranty • 30 day money back guarantee (less s/h) on orders from MFJ

MFJ ENTERPRISES, INC.
Box 494, Miss. State, MS 39762
(662) 323-5869; 8-4:30 CST, Mon.-Fri.
FAX: (662) 323-6551; **Add s/h**
Tech Help: (662) 323-0549

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	11930	Radio Taiwan Int.	CC
0000	15180	Voice of Korea, North Korea	SS
0000	9845	Radio Netherland via Bonaire, NWI	
0000	3250	Radio Luz y Vida, Honduras	SS
0000	9440	Radio Prague, Czech Republic	
0000	11920	HCJB, Ecuador	PP
0000	5815	World Music Radio, Denmark	
0000	9675	Radio Canaco Nova, Brazil	PP
0000	11745	Voz Cristiana, Chile	SS
0001	9580	Int. Radio of Serbia/Montenegro	
0015	9435	Democratic Voice of Burma, via Germany	vern.
0030	7545	Radio Ukraine Int.	
0030	9575	Radio Medi-Un, morocco	AA/FF
0030	4780	Radio Cultural Coatan, Guatemala	SS
0030	4052.5	Radio Verdad, Guatemala	SS
0100	11825	Voice of Russia, via Vatican	RR
0100	9590	Radio Budapest, Hungary	
0100	11775	Caribbean Beacon, Anguilla	
0100	3290	Voice of Guyana	vern.
0130	15275	Deutsche Welle Relay, Rwanda	GG
0130	9737	Radio Nacional, Paraguay	SS
0130	9980	AFN/AFRTS, Iceland	
0130	3279	La Voz del Napo, Ecuador	SS
0200	15400	Emirates Radio, UAE	AA
0200	11780	Radio Nacional da Amazonia, Brazil	PP
0200	9895	Radio Netherlands Relay, Madagascar	SS
0200	11675	Radio Kuwait	AA
0200	9905	VOIRI, Iran	SS
0200	4800	Radio Buenas Nuevas, Guatemala	SS
0200	9775	Radio Farda, USA, via Greece	Farsi
0200	9925	Voice of Croatia	EE/Croatian
0200	4885	Radio Clube do Para, Brazil	PP
0200	11700	Radio Bulgaria	BB
0200	7210	Radio Belarus	
0200	6025	Radio Amanecer, Dominican Republic	SS
0230	11810	Radio Korea Int., South Korea	
0230	9460	Voice of Turkey	TT
0230	4750	Radio Peace, Sudan	
0230	9965	Voice of Russia, via Armenia	SS
0230	4965	The Voice, Zambia	EE/Swahili
0230	7160	Radio Tirana, Albania	
0230	3215	Adventist World Radio, via Madagascar	
0245	4910	ZBC/Radio Zambia	
0300	4990v	Radio Apinte, Suriname	DD
0300	12005	RTT Tunisienne, Tunisia	AA
0300	3320	Radio Sondergrense, South Africa	Afrikaans
0300	15170	BSKSA, Saudi Arabia	AA
0300	3240	Trans World Radio, Swaziland	Shona
0300	15720	Radio New Zealand Int.	
0300	11800	RAI Int., Italy	II
0300	11860	VOIRI, Iran	Farsi
0300	9704	Radio Ethiopia	Amharic
0300	11815	Radio Brazil Central, Brazil	PP
0300	4875	Radio Difusora Roraima, Brazil	PP
0330	4976	Radio Uganda	
0330	6009	La Voz de tu Concencia, Colombia	SS
0330	4915	Radio Anhanguera, Brazil	PP
0400	6185	Radio Educacion, Mexico	SS
0430	6175	Voice of Vietnam, via Canada	VV
0430	5985	Radio Congo	FF
0500	6250	Radio Nacional, Equatorial Guinea	SS
0500	13630	Radio Australia	
0500	4950	Radio Nacional, Angola	PP
0500	4770	Radio Nigeria	
0600	4845	Radio Mauritanie	AA
0600	4760	ELWA, Liberia	
0600	4940	VOA Relay, Sao Tome	
0600	4915	GBC/Radio Ghana	
0630	6020	Radio Victoria, Peru	SS
0700	7125	RTV Guineenne, Guinea	FF
0730	11865	Trans World Radio, via Albania	
0800	11765	KNLS, Alaska	
0830	9970	RTBF, Belgium	FF
0930	9760	Radio Romania Int.	SS
0930	5939	Radio Melodia, Peru	SS
0930	6134.8	Radio Santa Cruz, Bolivia	SS
0930	6060	Radio Nacional, Argentina	SS
0930	6115	Radio Union, Peru	SS
1000	13770	Voice of Turkey	TT
1000	4939	Radio Amazonas, Venezuela	SS
1000	4955	Radio Cultural Amauta, Peru	SS
1000	4965	Radio Santa Maria, Peru	SS
1000	3385	Radio East New Britain, Papua New Guinea	
1000	9900	Deutsche Welle, Germany, via Russia	GG
1000	4815	Radio El Buen Pastor, Ecuador	SS
1000	6025	Radio Illimani, Bolivia	SS
1000	11725	Radio Trans Mundial, Brazil	PP
1000	7260	Radio Vanuatu	vern

UTC	Freq.	Station/Country	Notes
1030	5765u	AFN/AFRTS, Guam	
1030	4919	Radio Quito, Ecuador	SS
1030	4781	Radio Oriental, Ecuador	SS
1030	5019	Ecos del Atrato, Colombia	SS
1030	13685	Voice International, Australia	
1100	3905	Radio New Ireland, Papua New Guinea	
1100	12085	Voice of Mongolia	
1100	12080	Radio Australia	
1100	2310	ABC Northern Territories Service, Australia	
1100	6080	Radio Singapore Int.	
1130	4890	NBC, Papua New Guinea	EE/Pidgin
1130	4960	Catholic Radio Network, Papua New Guinea	
1130	3335	Radio East Sepik, Papua New Guinea	
1200	11500	Voice of Russia, via Tajikistan	Hindi
1200	11990	VOA Relay, Northern Marianas	CC
1200	11680	KCBS, North Korea	KK
1200	9930	KWHR, Hawaii	
1200	13665	YLE/Radio Finland Int.	Finnish
1200	11590	Radio Free Asia, USA, via Armenia	unid
1200	5995	Radio Australia	
1230	11605	CBSD, Taiwan	CC
1230	11785	VOA Relay, Thailand	CC
1230	15240	VOA Relay, Sri Lanka	
1230	11580	KFBS, Northern Marianas	CC
1230	17800	Radio Canada Int.	
1230	13580	Radio Sweden	
1245	11760	China Radio Int.	CC
1300	15285	BBC Relay, Singapore	
1300	7295	Radio Malaysia	
1300	12130	Trans World Radio, Guam	CC
1300	21530	Radio Farda, USA, to Iran	Farsi
1300	9570	China Radio Int., via Cuba	
1300	9580	Radio Australia	
1330	21830	RDP Int., Portugal	PP
1330	17775	Radio Tashkent, Uzbekistan	
1330	6150	Mediacorp Radio, Singapore	
1330	15240	Radio Sweden	
1400	21470	BBC Relay, Seychelles	
1400	15775	ISBS, Iceland	Icelandic; usb
1400	15606	Pan American Broadcasting, via Germany	
1430	11800	Int. radio of Serbia/Montenegro	AA
1430	11600	Radio Slovakia Int., Slovakia	SS
1430	15630	Voice of Greece	Greek
1430	15190	BBC Relay, Antigua	
1430	15140	Sultanate of Oman Radio	AA
1500	15745	Vatican Radio	II
1500	9840	Voice of Vietnam	
1500	12055	Voice of Russia	RR
1500	12045	Radio Japan/NHK, via Singapore	JJ
1500	13660	BBC, England	AA
1500	12050	Radio Cairo/Egyptian Radio	AA
1530	15745	SLBC, Sri Lanka	
1530	17630	Africa Number One	FF
1600	15395	Emirates Radio, Dubai, UAE	AA
1600	11570	Radio Pakistan	
1600	11690	Radio Jordan	
1600	15715	Bible Voice, via England	
1600	11885	Radio Solh, via England (to Afghanistan)	Dari/Pashto
1630	15150	Voice of Indonesia	AA/SS
1630	11975	Adventist World Radio, Guam	
1630	11655	Radio Rebelde, Cuba	SS
1700	15640	Kol Israel	Italian
1700	13810	Bible Voice, via Germany	unid
1730	15265	Channel Africa, South Africa	
1800	15580	VOA, via Botswana	
1800	15420	BBC Relay, South Africa	
1800	15190	Radio Philipinas, Philippines	Tagalog
1830	15345	RTV Marocaine, Morocco	AA
1830	17705	Voice of Greece, via USA	Greek
1830	15345	BSKSA, Saudi Arabia	AA
1930	15120	Voice of Nigeria	
1930	15205	Radio Jamahiriya/Voice of Africa, Libya, via France	EE/AA
2000	15185	Radio Africa, Equatorial Guinea	
2000	15445	VOA Relay, Morocco	
2000	15175	Adventist world Radio, via Germany	FF
2030	9680	Radio Thailand, via USA	
2100	17575	RDP Int., Portugal	PP
2100	7340	Radio Polonia, Poland	Polish
2100	7225	RTT Tunisienne, Tunisia	AA
2100	9445	All India Radio-Bangalore	
2100	6175	Radio France Int.	FF
2100	11975	VOA Relay, Sao Tome	
2100	9745	Radio Bahrain	AA; irreg
2100	9780	Rep. of Yemen Radio	AA
2130	9410	BBC, England, via Cyprus	
2130	15120	Radio Havana Cuba	SS
2130	7460	Radio Nacional de la RASD, clandestine	AA
2200	9620	VOA Relay, Philippines	Indonesian
2200	9600	Vatican Radio	CC
2200	11895	radio Japan/NHK, via French Guiana	JJ
2200	15495	Radio Kuwait	AA
2200	11605	Kol Israel	HH
2200	11715	All India Radio-Panaji	
2200	9580	Africa Number One, Gabon	FF
2200	7175	China Radio Int., via Russia	
2200	9610	Radio Taiwan Int.	CC
2200	9500	Radio Varna, Bulgaria	BB; Suns
2230	17675	Radio New Zealand Int.	
2230	15400	BBC, England, via Ascension	
2300	11760	Radio Nacional de Venezuela, via Cuba	SS
2300	11725	Radio Cairo/Egyptian Radio	
2300	9700	Radio Bulgaria	
2300	15345	Radio Nacional, Argentina	SS
2300	13755	VOA Relay, Thailand	
2330	15385	Radio Exterior de Espana, Spain, via Costa Rica	FF
2330	9870	Radio Austria Int.	
2330	5446.5	AFN/AFRTS, Florida	usb
2330	9875	Radio Vilnius, Lithuania	
2330	5030	Radio Burkina, Burkina Faso	FF
2330	11935	Radio Clube Paranaense, Brazil	PP
2330	6005	Deutschland Radio	GG

by Harold Ort, N2RLL

New, Interesting, And Useful Communications Products

Scancat-Lite Plus For Windows

The folks at Computer-Aided Technologies have been working overtime the past several months producing a brand new Scancat Product: Scancat-Lite Plus for Windows. This new Scancat program supports the memory programming for RadioShack and Uniden scanners at a reasonable price.

While the regular Scancat-GOLD supports both memory programming and scanning from the PC, the new Scancat-Lite Plus is targeted to those radio owners who need to program the radio's memories, but don't need scanning control. In the tradition of other Scancat products, all radios supported are available in one software product, which means if you have any of the radios supported by Scancat-Lite Plus, you only need to buy *one* software program. If you have more than one radio that's supported, you can use the same databases from any of the radios (to the limits of their frequency coverage and features, of course). Just pick the radio from the radio selection list and "plug it in."

The program supports both programming of the radio's memories and (if supported by the radio) downloading from the radio the frequency information already programmed. So you can download from one radio and send the same frequency information to a second or third radio.

If you don't have the frequencies for your area, the program supports the files created on the Mr. Scanner CD or downloads from the National Communications website for both the Mr. Scanner Public Safety CD and Mr. Scanner CD ROM. You can even cut and paste from Excel. Either way, there's little typing involved, and in a matter of a few minutes your radio will be up and running, programmed with all your local frequencies. Remember, all radios can use the same database (to the limits of their frequency coverage and features). Information on Mr. Scanner is available at http://www.scancat.com/mrscanner or http://www.bearcat1.com/mrscan.htm.

Computer-Aided Technologies' most recent additions to the Scancat-Lite support list are as follows:

RadioShack	**Uniden**
PRO-96	BC-296
PRO-94	BC-796
PRO-83	

Computer-Aided Technologies expected to have support for the new Uniden BC-246 by press time.

The following radios are currently covered by the Scancat-Lite PLUS software:

RadioShack	**Uniden/Bearcat Scanners**
PRO-76	BC-895XLT
PRO-79	BC-245XLT
PRO-82	BC-780XLT
PRO-83	BC-250D
PRO-89	BC-785D
RadioShack	**Uniden/Bearcat Scanners**
PRO-2017	BC-296D (Digital Handheld)
PRO-2019	BC-796D (Digital Desktop)
PRO-93	BC-246
PRO-94	
PRO-95	
PRO-96 (Digital Trunking)	
PRO-99 (Race Scanner)	

Support will be available soon for other scanners, including AOR's AR-8000, AR-8200, and AR8600, and later ICOM's IC-R10. The Scancat-Lite Plus is supplied on CD-ROM for $29.95 plus $5 shipping. You can order online at http://www.scancat.com/ and also download the product for immediate use. It is available from Computer-Aided Technologies by calling 888-722-6228.

New MFJ 2 3/4-Inch SMA Magnet Mount With Coax

MFJ Enterprises, Inc., of Mississippi announced their new MFJ-332S 2 3/4-inch mag mount with coax for $14.95. It's unique because you simply screw your walkie-talkie's SMA-mount lightweight rubber duck into it and pop it on top of your vehicle; just like that you've got a great mobile antenna for either ham activity or scanning!

MFJ's other new mag-mount is its MFJ-332B, the BNC version of this mount. MFJ products are covered by their "No Matter What" one-year limited warranty, which means the company will repair or replace (at their option) your magnet mount, no matter what, for one full year.

For more information or to get a free MFJ catalog, contact MFJ, 300 Industrial Park Road, Starkville, MS 39759; Phone: 800-647-1800; Fax: 662-323-6551; Web: www.mfjenterprises.com.

Cobra 76 XTR Mobile CB

Cobra announces the 76 XTR mobile CB with exciting new features, including an antenna and handset that turns neon blue when transmitting. The body of the CB radio mounts under a seat or dashboard.

Other features of the 40-channel radio include dual watch (so you can monitor two channels

The new Cobra 76 XTR mobile AM CB is a unique transceiver that features a remote-mount body and 40 channels.

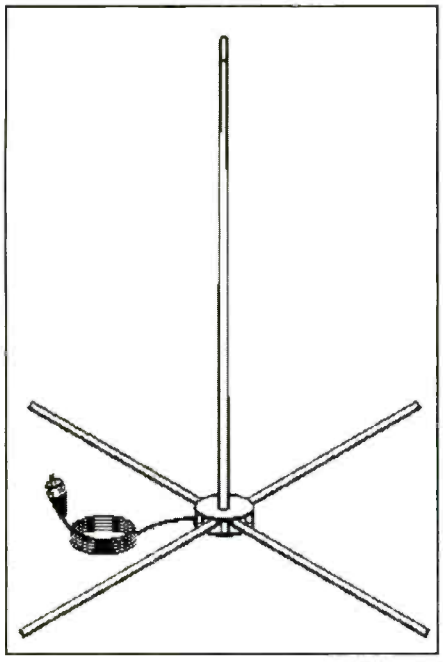
simultaneously), public address capability, illuminated LCD display, and standard 4-watt output. For more information on this unique mobile CB from Cobra (cost $129.95), contact the company directly at cobraelectronics.com or write them at 6500 West Cortland Street, Chicago, IL 60707.

Firestik Indoor CB Base Antenna

It might not be exactly brand new, but every once in a while we find a product that deserves an honorable mention in "Power Up." Firestik's IBA-5 indoor CB base antenna, priced at $51.99, is such an item.

Firestik says, "The IBA-5 was primarily designed to be used from the inside of a building or structure. The main user of this product would be a CBer who lives in an apartment or association area that restricts the use of outdoor antennas. Other uses may include single family residences, offices, and job-sites. The IBA-5 may also be useful to hunters and campers (on the ground or roof of your RV) to establish a temporary communications center. However, this antenna is not meant to be a replacement for an outdoor base station antenna."

Firestik correctly—and honestly—points out that the antenna will not outperform an outside CB base antenna; if you're able to use a good outside antenna, always do so. But if you're in an apartment or condo—or an emergency situation—you'll appreciate the IBA-5. The complete assembly stands just over five feet tall. Assembly is fast and easy. Each kit includes a "bare-hands tunable tip" antenna (rated at 1000 watts), a partially pre-assembled base hub assembly, four 30-inch radials, and 18 feet of RG-58A/U Fire-Flex coax cable. Firestik also includes a couple of extra tuning screws that can be used in situations where SWR indicates insufficient ground plane. Complete assembly instructions are included.



Firestik's IBA-5 Indoor CB Base Antenna is ideal for emergency situations or for CBers who live in apartments or condos.

For more information, contact Firestik directly at 2614 E. Adams Street, Phoenix, Arizona 85034-1495; Phone: 602-273-7151; Web: www.firestik.com.

MFJ has taken basic ceramic strain insulators to a different level. Not only are they inexpensive, they also come in various sizes.

New MFJ Ceramic Strain Insulators For Constructing Wire Antennas

The new MFJ-17A01 insulator is $1.95 each and accepts a 3/16-inch wire with 5/16-inch hole. Its length is 2 5/16-inches and diameter is 1 3/8 inches. The company's larger insulator, the MFJ-17B01, is $3.95 each, and accepts a quarter-inch wire with 5/8-inch hole. Its length is 3 1/2 inches and diameter is 2 1/2 inches. Its largest insulator, the MFJ-17C01, is $5.95 each. It's for a 5/16-inch wire with 3/4-inch hole. Its length is 4 1/2 inches and diameter is 2 7/8 inches.

To order, get a free catalog, or for your nearest dealer, call 800-647-1800; or write to MFJ, 300 Industrial Park Road, Starkville, MS 39759; or go online to http://www.mfjenterprises.com; or fax to 662-323-6551.

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

Hardened Targets: Nuclear Power Plants And Emergency Communicators Prepare For Disaster!

"This is W3LUZ. Luzerne County EOC on the air in support of the SSES Nuclear Power Plant Drill. This is a drill. All ARES volunteers are to immediately deploy to their respective municipal EOCs. I say again, this is a drill. All ARES volunteers are to immediately deploy to their respective municipal EOCs. This is a drill. W3LUZ, out!"

Jim Martin, N3DCG, Eastern Pennsylvania Section District Three Emergency Coordinator, had just initiated the primary Rapid Response Team (RRT) Level-I response to the annual Susquehanna Steam Electric Station (SSES) Nuclear Power Plant emergency preparedness drill in support of the Pennsylvania Power Light (PPL)s nuke plant near Berwick, Pennsylvania.

Eric Olena, WB3FPL, EPA Section Manager presents Chris Snyder, NG3F, with a Public Service Commendation for the work Chris and his staff did in making the first annual Eastern Pennsylvania EmComm Conference a reality.

Since 9/11 security in and around nuclear power production facilities across the nation has been tightened heavily. Despite independent studies that show nuclear power plants would be less attractive targets to terrorist organizations because of the industry's security programs, the sheer possiblity of an attack has caused the drills conducted in concert with FEMA and the Nuclear Regulatory Commission (NRC) to take on a new sense of importance. These drills, with focus on protecting public health and safety in the event of a radiological release, give emergency communications (EmComm) volunteers with ARES/RACES/REACT a chance to sharpen their traffic handling skills as well as to experiment with new modes of passing time-sensitive traffic. Add in "Murphy's Law," where things don't always go as planned, and you get an excellent training scenario that tests the EmComm volunteer's ability to think outside the box and overcome obstacles.

The SSES drill is one of several major ARES drills/events that the Luzerne County ARES members participate in annually. Other county EOCs (Emergency Operations Centers) from Lackawanna, Lycoming, Columbia, Montour, Wyoming, and Susquehanna counties also use this drill as a way of providing EmComm training for their ARES/RACES members. The county EOCs are tied together via the Pennsylvania Emergency Management Agency (PEMA) VHF network. As ARES/RACES EmComm volunteers, we provide the back-up comm links needed in case the primary radio network fails.

Going High Tech!

In addition to the standard VHF FM (2-meter) nets, the ARES folks deploy 1200-baud VHF packet nodes and also man HF NVIS radio gear at each county EOC to ensure that the EOC communications infrastructure remains intact during emergency conditions. In the future, the Amateur Radio EmComm operators will also adopt modes as Automated Packet Reporting System (APRS, a marriage of VHF packet radio and GPS technologies) to track, in real-time, the location and movements of disaster response key personnel; PSK31, a very narrow band HF digital mode that requires very low RF power output to provide near perfect hard copy of critical messages; and amateur

The distinguished panel of emergency communicators answered questions from attendees. From left to right, Eric Olena, WB3FPL, Tony Camillocci, KA3BPN, Bob Josuweit, WA3PZO, and moderator, Bob Reynolds, WB3DYE, senior reporter from WNEP TV Channel 16.

Recent Homeland Security Topics And Comments Received

Yes, I've been quite busy reading reader mail lately, and it's been interesting how it's made me look back at some of the ground we've covered. So I thought I'd just share a few more thoughts with you on recent topics.

BPL

Ah, yes...Broadband over Power Line (BPL) has attracted a lot of attention, especially lately since the FCC has relaxed the Part 15 rules and regs that apply to BPL. Like it or not, BPL is going full speed ahead, despite what we may read on the ARRL's website or in other publications. There have been instances where the prospective BPL providers have terminated their tests early in the testing phase, having lost interest in the idea of stuffing the Internet onto the power grid of America. However, that is not the end game.

Obviously in attempt to stimulate more interest in BPL, the FCC has recently relaxed Part 15 rules and regs dealing with this mode. This leaves the door wide open for tons of interference complaints, both by the radio hobbyists/commercial users of the HF spectrum and the BPL subscribers who receive interference from the hobbyists and commercial users. The FCC commissioners talk of selective filtering of specific frequencies and the fact that HF spectrum users located a "sufficient distance" from the power lines should not be bothered by the BPL modulation. However, at the majority of the testing sites, it has been proven that BPL can be a very severe source of interference many miles from the offending power lines used to transmit the data.

In the cases where the prospective users of BPL prematurely terminated testing, it appears that these BPL providers were plagued relentlessly with interference reports filed by hams and other radio hobbyists. That apparently is the key to de-glamorizing BPL for the power companies and technology developers. Faced with hundreds, if not thousands of interference reports, each one of which must be dealt with and resolved, it became abundantly clear to the BPL folks that this technology was not without problems. When confronted with the fact that it would take armies of technicians and troubleshooters to keep on top of the ever increasing deluge of interference reports, many prospective BPL providers had second thoughts about how lucrative it would be to become involved with BPL.

Despite all this, the FCC commissioners are still flashing BPL around as the next quantum leap in Internet technology. Those of us in the radio hobby and commercial side of the house that take a realistic look at BPL **KNOW** that this is flawed technology, at best. So, for all you readers out there who contacted me regarding BPL, let's just say this technology is not dead, by a long shot. However, the FCC is still beating this dying horse and it doesn't look like the facts make any difference in its attempt to push BPL onto center stage. Like Granddad George Arland use to say: "Dick, don't confuse me with the facts, my mind is made up!"

M/A Com OpenSky

Whoa! Did I ever open up the flood gates on this topic! I was deluged with e-mails and written correspondence regarding this supposed "White Elephant" of a communications system. Virtually everyone who contacted me was either: A. Outraged by the lack of foresight and technical adroitness on the part of the State of Pennsylvania for adopting flawed technology at an ever-escalating cost to the citizens of the state; or B. Declaring utter disbelief at the lack of foresight and technical adroitness on the part of the State of Pennsylvania for adopting flawed technology at an ever-escalating cost to the citizens of the state. Either way you cut it, OpenSky has been taking a beating in the local media, but the state is still locked in with this system and they vow to have it working, someday.

Thanks to all of you who took the time to send me additional info on M/A Com, as well as on your experiences with 800-MHz trunked systems and OpenSky. It was enlightening reading, to be sure.

Antenna Systems

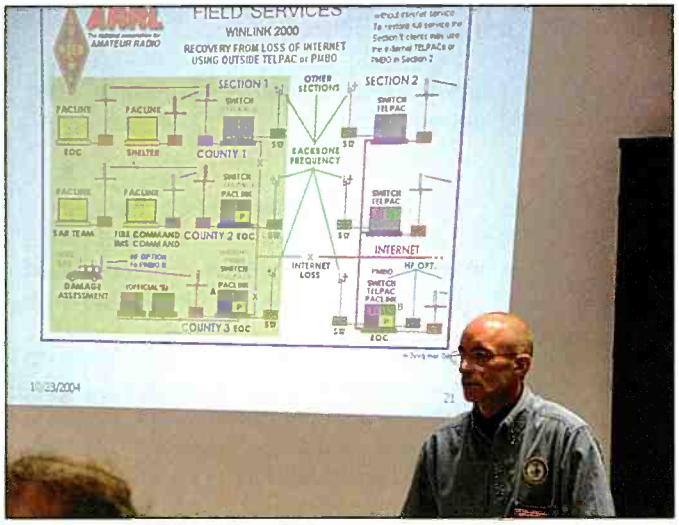
Last year I spent a lot of column inches talking about and explaining the various types of HF, VHF, and UHF antenna systems that will enhance your monitoring post. All my efforts and energies have not been wasted, judging by the influx of correspondence regarding antennas. It is a favorite topic for many of you and I will continue to explore it in the future. Upcoming antenna topics will include vertical antennas, balanced feed line and tuners for same, artificial grounds and proper bonding and grounding to ensure your physical safety and maximum efficiency for your antenna farm

television (ATV), which provides on-scene commanders visual access to the disaster sites on a real-time basis using full motion video transmitted over amateur frequencies.

For this particular SSES drill I was stationed at the Conyngham Borough EOC, about 25 miles from my home in Wilkes-Barre, Pennsylvania. Conyngham Borough is one of 18 municipalities within the 10-mile evacuation zone for the Burwick (PA) nuke plant. During the drills (and in the case of a "real-world" radiological incident) these same municipalities' communications systems are backed up by ARES volunteers from the surrounding counties.

My wife, the lovely and talented Patricia, and I were already in my truck heading down I-81, when we heard Jim's initiation of the RRT Level-I response. A Level-I response is used when an initial response to an emergency requires EmComm volunteers to be on site and on-air at predetermined locations within 30 minutes of the initial activation. The concept of a Level-I RRT response is to get critical communications links established in the shortest time possible.

A Level-I response is immediately followed by a RRT Level-II response, where better equipped and supported EmComm volunteers are deployed to the disaster site or, in our case, the 18 municipality EOCs within the 10-mile evacuation radius of the Berwick nuke plant. The



Chris Snyder, NG3F, explains how WinLink 2000 enables on-scene emergency personnel to utilize Internet e-mail, even though an Internet ISP is not readily available.

response time for Level-II activation is three hours. Typically the Level-II responders are able to bring additional communications gear, power production equipment (generators and solar charged batteries), and food for a much longer stay, somewhere around 72 hours.

Since these SSES annual drills are time-compressed for obvious reasons, a Level-II RRT response is not warranted or practical. However, during a "real-world" radiological event involving the SSES plant, ARES EmComm volunteers would be needed to staff the municipalities' EOCs for an extended time. In reality, the RRT Level-I responders would maintain their radio watch after Level-II personnel arrive on site, whereupon an operating schedule would be implemented to ensure 24-hour coverage of the VHF radio nets for a protracted time period.

Pat and I rolled into our assigned EOC approximately 15 minutes after the initial call out. I chatted briefly with John Wetzel, the EOC director, who told me where to deploy our equipment. Kirk Wetzel, John's son, is the EOC Communications Director. He welcomed our arrival, knowing that our gear provided 100-percent redundancy to his VHF network.

Theoretically, each municipal EOC has an amateur radio antenna and coaxial cable in place and permanently installed for use by the ARES EmComm volunteers. *However*, Edsel Murphy (you know, the dude that Murphy's Law is named after) lives for situations like this. John confirmed that the Conyngham Borough EOC had the antenna, but it had not been installed. This was a recurring theme at many of the municipal EOCs manned by ARES volunteers.

Mr. Eveready!

Being "Mr. Eveready," I had the foresight to pack an old military AN/GRA-4 mast kit with tripod adaptor, two spare VHF antennas, varying lengths of RG-58 coaxial cable, adaptors, guy wires, and duct tape. We had the GRA-4 assembled and the Ventenna VHF omni mounted at the 15-foot level within 10 minutes of arriving at the EOC. A quick radio check with W3LUZ verified that we were solid into the 145.41 (N3DAX) repeater used for the drill running only 5 watts output from my trusty Yaesu FT-817 transceiver.

At this point one might question whether or not a QRP radio is a good choice for EmComm requirements. In the case of these radiological drills, using lower power avoids (or at least minimizes) interference with the PEMA VHF radio network used for primary communications between the municipal EOCs and the Luzerne County EOC in Wilkes-Barre. The difference, of course, is the antenna, which in the case of the Ventenna, is an omni-directional gain antenna for VHF.

I also carry a 35-watt dualband VHF/UHF amplifier to boost the FT-817's output should that be warranted. In extreme conditions, I can assemble an Arrow Antenna four-element VHF Yagi that I keep in the truck. This small antenna, duct-taped to a wooden dowel, which is then duct taped to the top of the GRA-4 mast, offers several dB of gain and directionality over the

Some of the guest speakers at the Inaugural ARRL EPA Section EmComm Conference were (from left to right) Tony Camillocci, KA3BPN, PEMA Eastern Area Director, Bob Josuweit, WA3PZO, CQ Public Service Editor and EPA Assistant Section Manager, Chris Snyder, NG3F, Snyder County EC/RO, Eric Olena, WB3FPL, EPA Section Manager, and Bob Reynolds, WB3DYE, Senior Correspondent WNEP TV Channel 16.

Bob Josuweit, WA3PZO, CQ magazine's Public Service Editor, presented "Field Day is Not Enough—The Importance of Establishing and Promoting an Effective EmComm Training Program." Bob's thought-provoking presentation got many of us thinking of ways to improve our local EmComm training scenarios.

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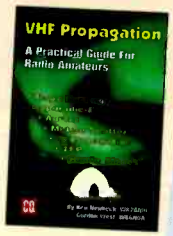

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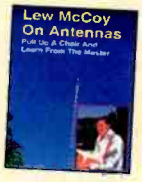

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The presentation by Tony Camillocci, KA3BPN, PEMA Eastern Area Director, addressed NIMS (National Incident Command System) and how it affects Amateur Radio Emergency Communications.

Ventenna. Using a combination of the 35-watt VHF amplifier coupled to the four-element Arrow Antenna yields an effective radiated power in excess of 100 watts. Positioning the Yagi antenna broadside to the PEMA VHF omni antenna further reduces the chances of interfering with its primary radio system due to the directional aspects of the Yagi.

Murphy Strikes

Remember Edsel Murphy? Unfortunately at one of the municipal EOCs, the ARES EmComm volunteer could not get on the air because the antenna and coaxial cable were missing. Apparently this operator had not thought to bring a spare antenna and coax. What's that old Boy Scout Motto: "Be Prepared"? In a real-world scenario this could have had dire consequences for the people in that particular municipality.

Like it or not, when you volunteer your services as an EmComm operator, whether you're affiliated with ARES, RACES, or REACT, you have to be able to work past such problems and get the job done; namely get on the air and communicate. I have developed the rule over the years of always carrying extra coaxial cable, connectors, spare batteries, antennas, and ancillary gear that will enable me to overcome most of the likely obstacles in establishing communications. Therefore, when the K7SZ truck rolls out of the parking lot on an EmComm mission, there is a lot of "stuff" that goes with me and my copilot. In the case of this year's drill, I had the necessary "stuff" to erect an antenna and get on the air quickly at my EOC.

We're Tested

During the drill we passed a total of seven priority training messages. At around 2115 EDT we were told that the EOC was evacuating and redeploying to our alternate command post. After informing W3LUZ of that, we were told by the Net Control Station (NCS) to secure our equipment, since our part of the exercise was over. Taking down the Ventenna and repacking the AN/GRA-4 mast kit was a bit of a job in the dark! However, we prevailed and were home enjoying a cup of tea and some pumpkin pie by 2215 EDT.

What do these kinds of drills teach us as EmComm volunteers? Proper message handling protocol for one thing. Over the years the messages transmitted by the EOCs and PEMA have been refined and boilerplate message forms are issued to all participants. This makes child's play out of handling message traffic for these types of drills.

In my humble opinion, these drills are not very realistic. One of the unfortunate realities we must deal with in these drills is the dependence upon volunteers, which invariably dictates that the amount of time allotted to the drill scenarios be truncated. This means that the drill conductors (FEMA/NRC/PEMA) have to be content with not being able to crank into the drill those little bumps in the road of life that could have an adverse impact upon the participants. Therefore, the realistic aspects of the drills suffer.

Using Simplex—It's Not Difficult!

For instance, we in Luzerne County depend quite heavily upon 2-meter FM repeaters to link together the municipal EOCs with the county EOC. It is not outside the realm of possibility to have one or more of our ultra-dependable repeaters suddenly go off the air for extended periods of time. This leaves us with the horrific thought of having to utilize simplex communications on VHF! Having lived for over five years in the United Kingdom, where simplex operations are the norm, I am more than comfortable using simplex to pass traffic. However, most stateside hams immediately cringe at the idea of having to use simplex in the face of repeater failures.

Simplex traffic handling requires some additional planning on the part of the EmComm volunteer, namely for directional antennas and possibly much higher power levels than normal just to initiate and maintain communications with the county EOC. Simplex operations also put the added burden on the NCS to ensure proper net discipline and transmitting order. In the case of simplex operations the NCS is "GOD" on the frequency and his or her orders have to be followed precisely and instantaneously if chaos is to be avoided. To put it plainly, the NCS has to be on his or her toes and must be a first-class operator to keep order on the net.

Other Radio Ideas

In addition to directional antennas (three- to five-element 2-meter Yagis), the prudent EmComm volunteer might also consider some type of portable mast/antenna support structure that

There was quite a "toy" collection in the parking lot. Here's the Lehigh County Mobile Command Post.

REACT was well represented with the Harrisburg REACT mobile comm van.

Wilkes-Barre City Mobile Command Post even made an appearance. As a matter of fact, four out of the five individuals who built this van were in attendance. W-B, PA takes EmComm very seriously!

can be deployed on the ground. It has been my experience that no one in the EOC will allow you access to their roof with the intention of putting up another antenna without building maintenance personnel overseeing the project.

Another drill that would be interesting to try is passing drill traffic using HF NVIS or 1200-baud packet radio between the municipal EOCs and the local country EOC. There is no reason that these modes would not work; however, it will take some pre-planning to ensure that the necessary equipment is available and that the links work with the reliability needed to back up the county's primary VHF net. Local EmComm training might include some of these scenarios just to ensure we volunteer communicators have something to fall back on besides 2-meter FM nets conducted over repeaters.

Your EmComm Adventures

Since this is *your* column, how about sending me (either via e-mail or snail-mail) a report of your exploits furnishing emergency communications with your local EmComm group. I would be especially interested in those of you who are affiliated with REACT and Civil Air Patrol (CAP) search and rescue (SAR). Does anyone out there in Radio-Land have experience with ATV ("quad") clubs that are affiliated with your local EMA or EmComm organization? I would be definitely interested in hearing about your experiences.

So how about it? You don't have to be a Pulitzer Prize winning author, just set down the facts and I'll edit for content. Pictures are worth a thousand words, so don't forget to send some graphics with your input. These can be via e-mail attachments, but just let me know prior to sending me material, since I delete all unidentified e-mails that have attachments due to virus and worm infections. If I know you're sending me something I won't hit the "delete" key when your message shows up in my in-box.

Judging from the e-mails and written correspondence, it seems that there are quite a few of you out there are actually reading this column (see box). That is a good thing! But I'd like to encourage you to either write me directly or via the magazine, or shoot me an e-mail (k7sz@arrl.net) if you have questions or comments about the column or would like to share something with other readers. See you again next month! And remember, preparedness is NOT optional! ■

by Ken Reiss, radioken@earthlink.net

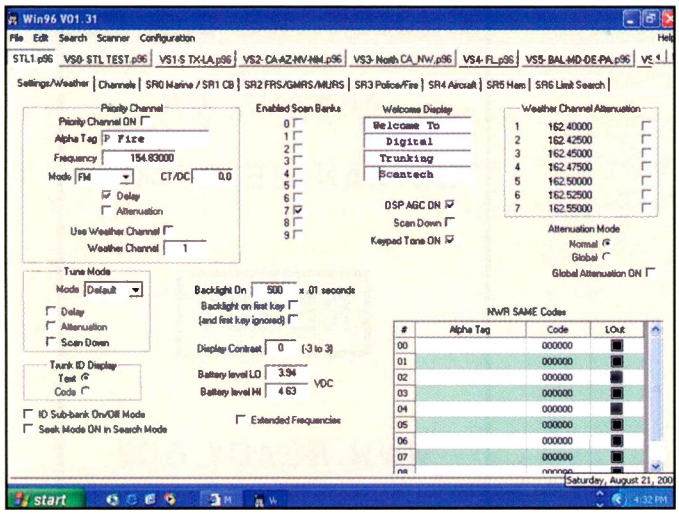
A New Communications Standard—Do YOU Need A Trunking Scanner?

Once in a while a radio comes along that sets the scanning world on its ear a bit. It's the kind of radio that everyone either has or wants. Radios like the PRO-2006 and the Trunktracker scanners would be the most recent I would put into this category. I think a new one may be on the horizon. Most of the time, when I review a radio, I get e-mail asking about this or that from people who have some interest in the unit. With our recent review of the PRO-96, I got e-mail from people who already owned it! Most of them were telling me things I missed in the review. This letter from Les is fairly typical of what I received, and he points out a couple of very interesting features of the radio that I really *had* missed! Les writes,

Great radio. I've had mine for a year now and Win96 the same amount of time. I think you had a typo in the 96 article, which indicated the 96 ran on six AA batteries. I'm sure you know that should have read four AAs [okay...that one I did know, bad keyboard].

I think you probably should have mentioned that although the military aircraft band is missing, it *can* be restored with Win96 software. Actually your first screen shot shows the extended frequencies box not checked. If you check this box and upload back to the scanner it will receive the mil band. The slight mechanical sound you mention can be turned off and made to sound much more like a natural voice. This is the DSP AGC and if turned off [FUNC-MAN] the voices sound much better, but the difference in volume changes from talkgroup to talkgroup and digital to analog are more annoying. So the DSP AGC smoothes out this volume change but has a slight unnatural voice to it. I think once you play with the DSP AGC you'll decide it's better on than off. The radio does sound better than a Motorola Astro because of it. I have a friend with four Motorolas who retired them all in favor of three PRO-96s. We are both waiting for the PRO-2096.

Could a new must-have scanner be on the horizon?

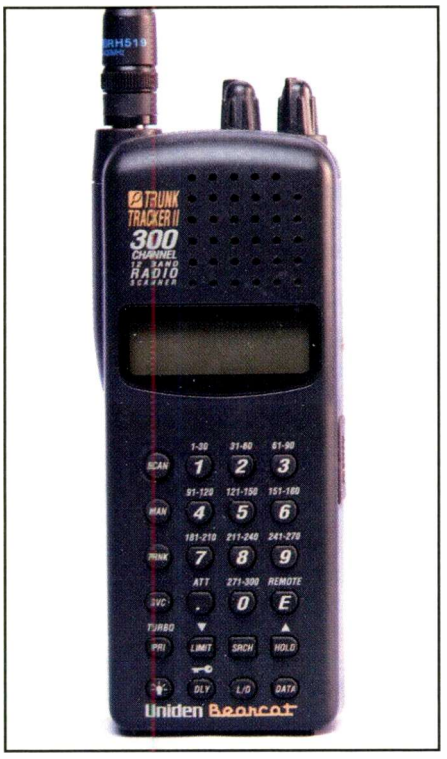


Sure enough, bottom center is the expanded frequency checkbox! Win 96 is full of surprises and a great way to program your PRO-96. If you have this radio, you should have the software too.

Lastly but not least, the PRO-96 actually has 11 V-folders as you mentioned, but there is a 12th. It's not actually a V-folder, but the working memory once you bring in a V-folder. The working memory is gone, but in a sense it's a 12th, essentially making the radio 6,000 channels; it's just not reusable. [Yes, it's there...I'll grant you that one, but if you use it that way you have to be willing to lose the active memory to use one of the V-folders. Is 6,000 channels really better than 5,500?] I enjoyed both articles while my power was out here and faithfully monitored my PRO-96 while enjoying the magazine.

Thanks for your comments, Les. And to everyone else who wrote, I do read them all, even if I can't respond individually, so keep them coming! Les also mentions a case for the radio that he recommends, and while he didn't provide details, I believe the information can be found at http://mx.geocities.com/cued630621ax7/Leather_cases.html. I haven't tried it, but Les seems very happy with it. Of course, Les likes this column, too, so that might make you wonder!

And that brings us to the main topic for the month, which is the question I get most often. It used to be "Which scanner do I buy?" but that's been replaced with "Do I really need a trunking scanner? This question comes particularly from beginners,



The first trunktracker handhelds were hard to get because demand was so great. Newer models have been a bit easier to find, and they have begun to offer choices in how they operate.

but also from many experienced scanner listeners who just haven't had to deal with the issue until now, or who just went shopping for a new radio and wondered what they'd be getting into or missing if they choose one way over the other.

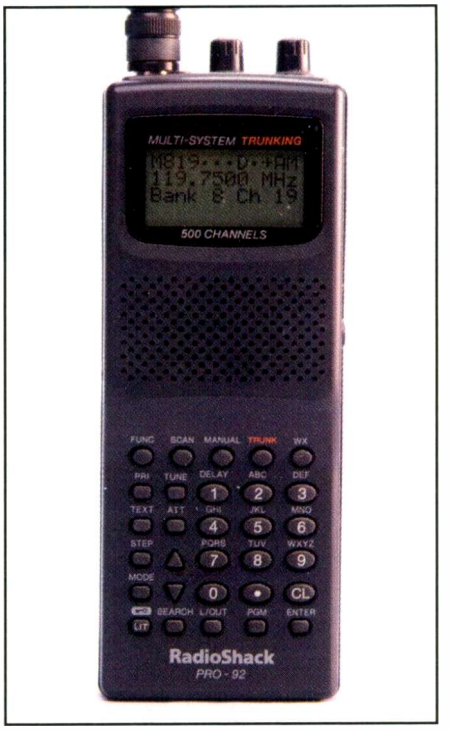
Conventional Scanning

To appreciate what trunking is or does, you need to understand conventional scanning, perhaps in a bit more detail than you've thought about in the past. I'm certain that if you've owned a scanner for more than five minutes, you probably have a pretty good handle on what conventional scanning is. If you've been scanning for any length of time, or if you've ever watched television, you'll have a pretty good idea of how conventional scanning works. "What's television got to do with this?", I hear you cry. Television uses channels, just like conventional scanning. If you want to find the evening news, you turn on Channel 8 or 41 or whatever number it is in your city. When you're finished watching the news, there will no doubt be some mindless program to catch your attention. This is a good time to turn on your scanner and cut your losses. However, tomorrow night, when it's time for the news, or the mindless program that you want to watch (hey, there's nothing wrong with entertainment), it will be on that same channel number. They don't change much except for the occasional reshuffling by the cable company or FCC re-licensing.

Conventional scanning operates the same way. The agency (local police, for instance) applies to the FCC (I know, they have to go through frequency coordinators and a whole raft of other paperwork, but let's keep it simple) for a "channel." The FCC assigns, in due time, a frequency to that agency for its use, and except for certain shared channels or business band where the rules are a bit different, the agency can expect that the frequency will be for its exclusive use in its geographic area. In fact, it's the job of the regional frequency coordinator to make sure that the same frequency does not get reassigned to another agency that's close enough to cause interference. That's not a small job with today's crowded bands.

So when you want to listen to that agency, all you need to know is that frequency and punch it into your radio, just like selecting a TV channel, and presto, there it is. The only difference, of course, is that TV channels broadcast on a continuous basis, whereas our public safety agency will only transmit only when there's a need. That's why you have a scanner in the first place. You fill up a bunch of channels in your scanner with frequencies of various agencies around you and you're scanning. The radio steps from channel to channel waiting for something to happen. When something is found, the receiver opens the squelch so you can hear the action. When it stops, the scan resumes where it left off. We can even get sophisticated and have our scanner check certain frequencies more often than others (priority scan) or using computer software, develop all sorts of routines the scanner might do based on what frequencies are active at any given time. Of course, this requires a computer-controlled scanner and software to make it work, but it's all *conventional* scanning. One channel per customer, so to speak.

The newest and greatest from RadioShack, the PRO-96, offers digital decoding as well as trunking. See the full review in the November 2004 Pop'Comm.



This slightly older model from RadioShack makes a great conventional scanner, as well as a trunktracker.

Communications Nightmare

Let's play the role of a communications coordinator of a small but growing public safety agency for a few minutes. You've applied for your conventional channel above, and gotten a VHF-HF band frequency. You've gotten all the equipment installed in several mobile units and everything's working fine. Well, almost fine. You've had your channel for

Trunking is not limited to handhelds any longer.

some time, and you notice that the traffic is getting heavier. There's a lot of waiting for open-air time to dispatch calls. Officers are keying up on top of each other trying to get through. And there's way too much car-to-car chatter. Wouldn't it be nice if you could maybe get a car-to-car channel, and possibly a second dispatch channel? That would work, and you could also divide the city in half—north and south (or east and west, if you prefer) and have two channels. You were smart and installed in the mobile units radios that have extra channel positions, so all you need is an extra dispatch console and a couple of frequencies. So you write off to the FCC and say "we'd like a couple more frequencies." Of course, you can't just write to the FCC and say that, you have to put it on official "we'd like another frequency" forms, and dot the i's and cross the t's, but you get the drift.

The FCC writes back and says "Gee, terribly sorry, dude, but we've only got frequencies available in your area on UHF." Well, of course, they don't really say "terribly sorry, dude," but they put it in an official government form letter that says, "no such luck" in FCCese, so to speak. Now what? Put UHF radios in all the mobiles to accommodate the new channels? That's an expensive proposition; you'll have to buy new radios for every mobile. How about moving the new "north" sector to UHF and leaving the "south" (you can substitute "east" and west" again) on VHF? What if they need to talk to each other? Move everything to UHF? Can you get a third frequency on UHF? Do you have to buy new radios again. Bummer. Maybe you could wait until someone else moves off VHF and grab those frequencies. Perhaps, but that could be a very long wait. It's a real nightmare! But there is help.

Trunking

While installing a trunking system will mean that you have to buy new radios too, it gives you some long-term options that you can't get with a conventional system. Part of the rapid move to trunking has been because there weren't any VHF or UHF frequencies available in certain areas, and the 800-MHz trunking frequencies opened up a lot of new channels. Even *without* trunking, 800-MHz was the only way some agencies could get new *conventional* frequencies, so you will find *some* conventional channels on this band, but they are not common. Yes, you have to buy new radios, but as long as you're going to do that, you should get some with future expandability. With a *trunking* system, your communications officer applies to the FCC for a block of frequencies, usually five at a time, although busy systems may need 10, 15, or even up to 30 frequencies. These are frequencies just like you were applying for before, but with a difference.

"Now hold it, Dudley," you may be saying, "you just said that getting even two more channels was going to be a problem. Now I'm supposed to ask for five to 30? What's the chance of that? I'll bet the FCC has official 'Gee, that was funny, now get serious' forms to send out for these requests." Well, not exactly. The 800-MHz band was sectioned off to allow trunking systems exclusively in a certain portion of the band. There are also some frequencies available in certain parts of the country in the 760- and 900-MHz range. These higher UHF signals do not typically travel as far as VHF and UHF (450-MHz) signals, and so the frequencies can be reassigned to another agency much closer together. Combine this with the FCC's drive toward more efficient spectrum usage, and you'll more than likely get a "Great, here you go" form. The band is filling up, so it's getting a bit tougher. It won't be long (in fact I think in some parts of the country it has already happened) that you can have a trunking system in the 450 band, too. I'm sure VHF won't be far behind as the systems spread and old conventional systems are replaced.

Great, so now you have frequencies, what happens next? You need trunking *equipment*. These are special radios that take advantage of the trunking system to allow for increased efficiency in frequency usage. Remember that you applied for a *block* of frequencies, just like before. They are assigned for your exclusive use, just like before, but after that, you need to forget all you know about frequencies. They are now almost irrelevant.

Channels!

The *conventional* system locks each function on a specific frequency. But listen to your scanner; what do you hear most of the time? Silence. Most public safety nets do not transmit a large portion of the time. So the frequency is sitting there unused until someone decides it's necessary to talk. That's why we listen to these channels with a scanning receiver. All the cars assigned to Channel 3 stay on Channel 3 and hear a lot of nothing, while our scanner skips over that frequency because it's not in use until someone transmits. A *trunking* system creates a "virtual channel," that is a channel that looks and acts like a channel—everyone listens to Channel 3 and hears nothing most of the time, but without a designated frequency.

At this point, it's probably important to note that we'll be talking specifically about the Motorola type II trunking system, which is used by most trunked public safety agencies throughout the country, and that the Uniden TrunkTracker radios will follow. Type I and type IIi systems operate exactly the same way. The EDACS (made by Ericson/GE) system used by some

The BC-780 introduced alpha tags for trunking talkgroups. The newer 785 includes an option for digital, but does increase the price of the radio considerably.

public safety agencies operates in a very similar manner, except with a different set of codes (protocol) for the control channel and radios. The frequencies you applied for get used like "conference rooms," in a sense. One of the frequencies is dedicated to the trunking control system. This is a computer controller that manages the scheduling of these virtual radio channels.

Suppose you're listening to Channel 3 and nothing is happening. There's just silence, so why bother being on the frequency. You can just monitor the control channel waiting for a command to meet in a "conference room." When someone transmits (either the dispatcher or a car), the controller looks for an unused conference room (in this case, it's an actual frequency that isn't busy). Once it locates one, it sends out a command to all radios monitoring Channel 3 to meet in that conference room now, and the radio switches to that frequency and you'll hear the transmission, just like a regular conventional channel.

All this activity of finding a conference room and moving all the radios to it takes place in a fraction of a second. On some systems, the radio will emit a beep when the officer pushes the transmit button. That beep is to let them know not to talk until the system is ready and everyone should be in the room. But the next time you want to talk on Channel 3, that conference room might be busy. No problem, you can take any available room. So the next transmission might well take place on an entirely different frequency, any of the block of 30 you might have. The officers in the car and the dispatcher can't tell the difference. It sounds just like good ol' Channel 3.

All this technology for normal operations may sound like a lot of trouble and expense, but remember our communications officer got in trouble when he wanted to expand the number of channels in his system. Here's where the *trunking* system shines. You've already got the *block* of frequencies assigned, so you don't have to bother the folks at the FCC, or exchange any fancy forms with them. All you do is create another virtual channel and assign some radios to use it. The controller can wait for that one to become active, just like he did with Channel 3.

You Ever Listen To One Of These Things?

The trouble for us scanner folks comes when we try to listen to a *trunking* system with a radio that's not aware of the *coding system or the commands* taking place on the control channel. A *conventional* scanner just goes plodding along from frequency to frequency, catching whatever conversations might be happening in the various conference rooms as you go. So you might hear Channel 3 officers with an exciting pursuit, and then the next conference room could be the dog catcher or some equally interesting city service. The Channel 3 guys might have had several conversations in various conference rooms by the time you catch up with them again.

Here's where the trunking *scanner* comes into play. To follow the conversations, you need to have a radio that knows how the system works. A trunktracking scanner can follow that control channel information just like the radio in a police car. So you can hear only what happens in conference room 3, if that's what you're interested in. Or you can let it scan the virtual channels that you're interested in just like a conventional scanner. Once it's programmed, you won't be able to tell the difference either, but the programming is a bit different.

Blocks

Trunking systems were designed so business users, as well as public safety agencies, could take advantage of this technology. In fact, many business two-way radio systems are being migrated to trunking-based systems as it helps the owners of the systems increase capacity.

One advantage of trunking is its ability to have many different types of users sharing the same system, because they won't know each other is there. One way the trunking controller can handle this situation is by dividing the available channel groups into "blocks." There can be as many as eight blocks (numbered 0 to 7) in the system, although some configurations might limit this number, or not all blocks may be in use. Within each block, it must be decided if the controller and radios are going to use the type I or type II format of communications. Type II is the newer one, and therefore more versatile. Most systems installed in the last several years have been type II, and many systems that started out as type I have been upgraded (particularly for public safety use). But a lot of cities also have type I radios floating around from the early days and might still use those. This is referred to as a Type IIi system. Certain blocks are designated as type I blocks, and others are designated as type II blocks. Of

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.*

The frequency this month, in keeping with our trunking theme, will be **857.4375**. Have a listen and let me know what you hear. Even if you don't hear anything, you can still send that in, and we'll enter your name into the drawing for a one-year subscription to *Popular Communications*. What have you got to lose?

course, the controller has to keep up with who's on first, so to speak, but it's a computer with nothing better to do.

Fleets And Subfleets

These terms get bandied about quite a bit, and a lot of confusion exists regarding their use. Technically, fleets and subfleets are the terms used to describe a type I system's blocks and channels. The fleet would normally be a cohesive group (water department, police department, fire department, particular company, etc.) and the subfleets would be the individual channels that were available to those radios. Often the radios would designate the channels by letter, and the users would be totally unaware that there were other fleets sharing the same system.

Talkgroups

The type II term to describe a channel is "talkgroup." Each talkgroup belongs to a block (you can divide the Uniden decimal number by 8192 to figure out what block a given talkgroup is in, if you care). Each talkgroup represents a channel to the users of the radio. In fact, the user of the radio probably doesn't have any idea if he or she is using a type I or type II system. It turns out that the type II system is more efficient and flexible, so that's what you'd prefer, but a lot of type I traffic is still out there and going strong.

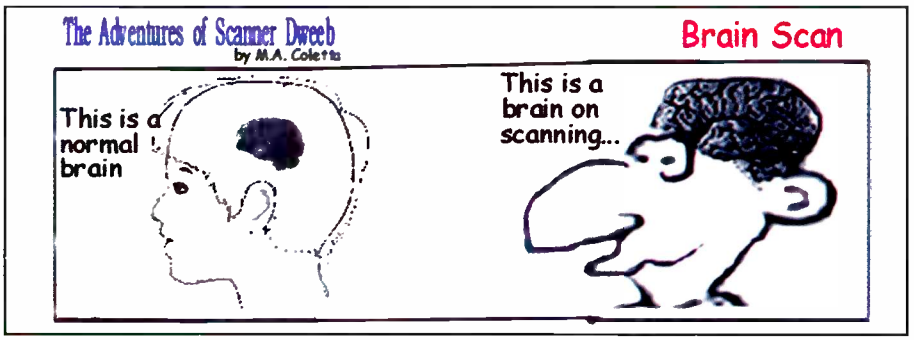
No matter which system the agencies have (or the combination of the two), the net result is the same, if everything is working correctly. The users have a channel to go to for a particular type of traffic (dispatch, records check, car-to-car, etc.) and they can talk to each other. The communications coordinator can create new channels at any time, assuming the maximum capacity of the system has not been exceeded, without exchanging memos with the FCC. And everybody's happy.

Keep On Trunkin'

And there you have it. Trunking provides great benefits to the communications industry by making better use of the limited frequency space available. You'll be seeing more and more of it, and on bands besides 800 MHz as time goes on.

Remember, your input is always welcome. Send your comments, suggestions, photos, frequency of the month entries, and anything else you think might be of interest to fellow scanner listeners to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126, or e-mail to radioken@earthlink.net.

Until next month, good listening! ■



INFOCENTRAL *(from page 5)*

and encourages them to act to protect public safety in their future order."

Moving Mountains Can Be Done!

Joe Hanlon of New Jersey, reporting in the online Electronic DX Press (EDXP) says, "As a result of my suggestion to Voice of Turkey, and some assistance from Turkish Radio & TV monitor George Poppin in San Francisco, Voice of Turkey is moving away from 7275 (and amateur radio QRM) and, as of November 23, will be using 5960 at 2300–2350 to Europe and North America for their English broadcast."

Wavescan DX Program Contest Results

According to Adventist World Radio's (AWR) news release:

The number of entries was very high with all continental areas well represented, and the quality of the entries was also excellent. The contest invited listeners to examine their QSL collection and to choose five QSLs with a specific theme. Listeners were then invited to select a second set of five QSL cards that illustrate a different theme. A script suitable for broadcast was also invited, as were three radio cards, and three reception reports.

Following a close examination of all entries, "Wavescan" is pleased to announce all of the winners for our "Wavescan 2004 DX Contest." The World Winner for 2004 is again Gunter Jacob in Passau, Germany. This is now the fourth time that a previous World Winner has won the annual contest on two separate occasions. The list of World Winners who have won the contest on two consecutive occasions are:

Victor Goonetilleke, Colombo, Sri Lanka, 1977 & 1978
Bryan Marsh, Auckland, New Zealand, 1980 & 1981
Andrew Elwell, Sydney, Australia, 1982 & 1983
Gunter Jacob, Passau, Germany, 2003 & 2004

The additional Continental Winners are:

Africa, Phillips Melle, Egbe, Nigeria
North America, Andrew Lisowski, Virginia USA
Latin America, Richard Chen, Tacarigua, Trinidad
Pacific, Michael Stevenson, NSW, Australia
Europe, Heinz Haring, Kapfenberg, Austria
Peter Boeck, Offenbach,Germany
Asia, T. R. Rajeesh, Kerala, India

In addition, the "Award of Merit" is conferred upon the following listeners who submitted excellent entries:

Brazil, Jose da Cunha
Bulgaria, Rumen Pankov
Canada, Ashok BoseChile - Armando Campos
Denmark, Hans Lollike
England, Patrick Jeffers
France, Christian Ghibaudo
Germany, Marcel Goerke
Italy, Giovanni Sergi
Japan, Eiji Kitamoto
New Zealand, Peter Grenfell
Sweden, Bjorn Fransson
Ukraine, Sergey Kolasov
USA, Fritz Layer

The "double" World Winner, Gunter Jacob in Germany, will receive an appropriate award plus the coveted Bronze Medallion. The Continental Winners will receive a copy of *Passport to World Band Radio* or *World Radio TV Handbook*, and the Merit Winners will receive AWR souvenirs.

Adventist World Radio thanks all of the numerous participants in their "Wavescan 2004 DX Contest" and also expresses our appreciation for the large number of radio cards that were submitted. They invite you to continue listening to Wavescan; and since production of the program has moved to Singapore they're particularly interested in your comments and listening observations. ■

RSGB Books now available from CQ

Antenna Topics

byPat Hawker, G3VA

RSGB. 2002 Ed. 384 pages.
This book is a chronological collection of selections of G3VA's words over the years. Hundreds of areas and subjects are covered and many a good idea is included.

Order No. RSAT $29.00

Antenna Toolkit 2

By Joe Carr, K4IPV

RSGB & Newnes, 2002 Ed.
256 pages.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. **$34.95.**
Order: **RSTAF**
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

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.

Order: RSHFAC $16.00

Practical Projects

Edited by Dr. George Brown, M5ACN
RSGB 2002 Ed, 224 pages
Packed with around 50 "weekend projects," Practical Projects is a book of simple construction projects for the radio amateur and others interested in electronics. Features a wide variety of radio ideas plus other simple electronic designs and a handy "now that I've built it, what do I do with it?" section. Excellent for newcomers or anyone just looking for interesting projects to build.

Order: RSPP $19.00

The Antenna Experimenter's Guide

RSGB. 2nd Ed, 1996. 160 pages.
Takes the guesswork out of adjusting any antenna, home-made or commercial, and makes sure that it's working with maximum efficiency. Describes RF measuring equipment and its use, constructing your own antenna test range, computer modeling antennas. An invaluable companion for all those who wish to get the best results from antennas!

Order: RSTAEG $28.00

Backyard Antennas

RSGB, 1st Ed., 2000, 208 pages.
Whether you have a house, bungalow or apartment, Backyard Antennas will help you find the solution to radiating a good signal on your favorite band.

Order: RSBYA $30.00

IOTA Directory - 11th Edition

Edited by Roger Balister, G3KMA.
RSGB, 2002 Ed., 128 pages
This book is an essential guide to participating in the IOTA (Islands on the Air) program. It contains everything a newcomer needs to know to enjoy collecting or operating from islands for this popular worldwide program.

Order: RSIOTA $15.00

Low Power Scrapbook

RSGB. © 2001, 320 pages.
Choose from dozens of simple transmitter and receiver projects for the HF bands and 6m, including the tiny Oner transmitter and the White Rose Receiver. Ideal for the experimenter or someone who likes the fun of building and operating their own radio equipment.

Order: RSLPS $19.00

HF Amateur Radio

RSGB. 2002 Ed.
The HF or short wave bands are one of the most interesting areas of amateur radio. This book takes the reader through setting up an efficient amateur radio station, which equipment to choose, installation, and the best antenna for your location and MUCH more.

Order: RSHFAR $21.00

Radio Communication Handbook

Edited by Dick Biddulph, G8DPS and Chris Lorek, G4HCL.
RSGB, 7th Ed., 2000, 820 pages.
This book is an invaluable reference for radio amateurs everywhere. It also provides a comprehensive guide to practical radio, from LF to the GHz bands, for professionals and students.

Order: RSRCH $50.00

RSGB Prefix Guide

By Fred Handscombe, G4BWP.
RSGB. 6th Ed., 2003. 48 pages.
This book is an excellent tool for the beginner and the experienced hand alike. Designed with a "lay flat" wire binding for ease of use the new "Prefix Guide" is a must for every shack.

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by Dave Schmidt, TheRadioColumn@aol.com

Pop'Comm Welcomes New Columnist, Dave Schmidt And DXing: A Changing Radio Hobby!

Welcome to the February 2005 issue of *Pop'Comm* and my very first adventure with the "Broadcast Technology" column. First, I wish to make a tip of the hat to Bruce Conti who did a great job with the column and wish him the very best with his future!

As for myself, I've been active in DXing the Broadcast Band since 1964, having verified well over 1,000 stations. My activity has slowed down, though, in recent years due to a very hectic work schedule, where I am employed as a broadcast technician with a company in New York. I have been involved in radio since the mid 1960s, both on the air and as an engineer. I still very much enjoy working on AM stations, but was especially glad when I had the chance to build (then) WVNZ-670 in Clairemont, Virginia, with Pat Murphy and Jim Grainger. Now I often working on stations I'd heard many years ago and wonder to myself how I could have heard this station! I have also been an editor for the National Radio Club for 25-plus years, now editing the "Musings Of The Members" column.

Over the next few months, I would basically like to give everyone an overview of how a radio station really works and why some have one tower while other have three, four, five, or more! Perhaps you've wondered why you can't I hear a local station after a certain time, or maybe you've wondered what IBOC is. We'll also take a look at certain conditions and how they change DXing and how a DXer can take advantage of them in hearing stations. We'll also examine some of the FCC rules and regulations and talk with other station engineers, showing you what can happen to a reception report when you send it to them. We'll go over ways to write a *great* reception report and what to do if you don't get that prized verification. Interested in how consolidation has changed radio? We'll investigate that. And we'll take a look at Internet Broadcasting and why there are so few stations doing it (and provide some GREAT ones to listen to!). We'll also cover items dealing with FM and other broadcast related items.

I invite input from you, things that have worked for you and you feel can be shared with others. Of course, I invite your loggings and reports of verifications. Your receiver information plus the type of antennas that give you the best results will also be very welcomed. I welcome both regular mail and e-mail reports. So let's hear from you today! I look forward to giving you an enjoyable and entertaining "Broadcast Technology" column in *Pop'Comm* every month with information you can use!

Let's Start With DX

As we head into the month of February, the AM DX season is past the midway point. I hope you're hearing some great DX this season, short of the interruption we had with some wild sun activity in November. Even though sunspot activity takes out a lot of the skywave signals that we hear each night (especially from the north, west, and east) and "pipelines" the south, it *can* be a big benefit to the DXer as it clears out a lot of the interference you generally get on the regional and graveyard frequencies.

On the East Coast, it wasn't uncommon to hear many Florida stations on the graveyard channels during the period of sunspot activity, and even in the days when they powered down to 250 watts Florida was an easy catch. It all boils down to being at the right place at the right time, to catch the ID and say to yourself "hey, that's a new one for the logbook." As time goes on, we'll incorporate various DX tricks that have worked very effectively in hearing new stations. It makes the hobby that much more enjoyable!

The Evolving DXer

Probably the best way to describe a DXer is with the single word UNIQUE! When you stop to think about it, who would sit at the radio and listen for far away stations at all hours of the day and night?

You're first forays into DXing probably started when you tuned your parents' radio and could hear Chicago, Fort Wayne, Buffalo, Seattle, or LA. The bug bit then! You kept a list of the stations you heard, took a few notes, sent the station a note that you'd heard them and what you heard and received a thank-you note in return, your *first* prized verification. Perhaps you were then tipped off about radio clubs that catered to DXers for AM, FM, or TV bands and joined up! You received your first radio DXing publication and learned that there are many others throughout the world who shared in the same hobby. Once a year, the club had a convention where you got to meet the people you read about and got to share tips and stories of what you were hearing and how you'd heard it.

Then, down the road, it was time to upgrade to a better radio, whether portable or desktop, plus you started to learn about how different receive antennas worked. Believe me, the hobby has changed a lot from the days of simple longwire and box loops to modern phasing units and even desktop loops and active antennas. Many folks have spent the time to do studies on improving reception of signals through phasing, and many plans are available to the DXers able to build such items themselves or have them made.

Staying On Top Of Changes

Receivers have also changed dramatically over the years, from portables to ones that go on the table in the den. Upgrading is not uncommon in receivers; it's all just a matter of what you want the receiver to do. What's the best receiver? My advice is

to look in any publication, such as for AM DXing, the *National Radio Club DX NEWS,* and the International Radio Club of America *DX MONITOR* to see what others are using and shop around for the best prices. And, if you're one that has to "go portable," there are always radios from Grundig, Sony, or RadioShack, or the trusty GE Superadio III.

Joining a DX club also gives the DXer access to many aids in hearing stations, such as log books of both domestic and foreign stations. Joining a club also offers you updated information on changes in the industry, new stations that have hit the air, or on DX texts. For those unfamiliar with that term, it's when a station signs on in the middle of the night just for the DXer, offering a special identifiable item that would not be heard during normal programming hours. This may include marching band music (which always seems to cut through the interference!), siren tones, or Morse code station identifications. The FCC hasn't taken away the rule of "testing during the experimental period" between midnight and 0600 (or local sunrise if before 0600). Stations can then run their day facilities in the middle of the night; you would be surprised at how much of a reception difference this makes.

The AM and FM band conditions have changed greatly during the last 30 years from when Monday was the big morning to DX the AM band, with stations down for actual transmitter work, but with the business getting more competitive with more stations, going off the air is something quite rare these days. This is also due in part to equipment being more reliable and the relaxing of the FCC rules and regulations on monitoring and engineering.

Wanted: Your Loggings And Photos

I told you a bit about me, now I'd like to hear a bit about you. Your DXing adventures are welcomed here, so please tell me how you got started in the hobby, and we'll share your story with our readers. My first real receiver was a car radio from a Hudson (who remembers them?), for which I had built a special power supply and managed to hear over 350 stations in the first couple of years I was listening. That radio had a beautiful push-pull 6V6 audio section in it and was able to get right against semi-local stations where you could actually listen to them. Others were amazed with what I was able to hear with that setup—now that I think of it, it *really was* amazing!

The main point is for you to *enjoy* what you are doing. Hearing a station ID from far away is still a thrill to thousands! Keep notes on what you hear, record on your MP3 or CD burner (or, heaven forbid, your tape recorder!) what you've heard and consider sharing it.

Again, I welcome your DX loggings and input each month. You can e-mail me at TheRadioColumn@aol.com or write via regular mail to P.O. Box 3111, Scranton, PA 18505-0111. Let me know of your DX doings, what you're hearing, and some of your own techniques which may help others in hearing stations. If you have a comment, the soapbox (or squelch control!) is yours. Your ideas and suggestions for future columns are always welcome. And FM DXers, keep in mind your time of the year is sneaking up on you so we'd appreciate your input also.

We *will* be bringing back the FCC call letter change information as soon as we can get the okay from the sources used previously. Here's to good DX for you, and we'll see you next month! ■

by Steve Douglass, webbfeat@1s.net

9/11 Commission Report Fallout, And Monitoring North Korea— The Next Likely Hotbox!

I've decided to bump our "Back To Basics," and our look at shortwave receivers for this month so I can clear the mountain of news items and issues piling up on my desk. There's a lot, so let's do it!

Seems my comments about the *9/11 Commission Report* being the *definitive* book on what happened on that tragic day in 2001 drew some fire from some very vocal readers who said I was being deluded into believing (what they thought) was a book full of lies perpetrated by our government to cover up what they saw as a conspiracy by the Bush administration to use the event an excuse to invade Iraq.

Yes, there was a lot of heat in those e-mails, but not a lot of light. Out of the dozen or so e-mails I got saying I had been duped, most were just plain nonsense or plain obscene. There was even one guy who thought when (in my article) I wrote "despite what whacko conspiracy theorists think" I was talking about him and him alone. I tried to engage him in an honest debate about what I thought were the major flaws in his argument, but when his beliefs were questioned, his letters became vulgar and personally threatening. One reader (who said he once worked for an intelligence agency) did have what sounded like some valid concerns about what he thought were unanswered questions in the 9/11 report, but when I tried to reply, my e-mails bounced back to me as invalid.

I do understand where they're coming from, though. It's hard to reconcile the fact that 19 men armed with box cutters could take down the biggest building complex in the world, damage the Pentagon, and kill thousands on the ground and in the air. Those that think the scales just don't balance should understand the terrorists weren't just wielding box cutters but had the training and determination to turn average everyday airliners into huge human-guided cruise missiles filled with thousands of gallons of jet fuel.

Clearing The Air

In light of that, let me clarify what I meant when I said the National Commission On The Terrorist Attacks On America's report was "definitive." I meant it is the *standard*, which serious investigative journalists should use as the basis of any forensic investigation. It's thorough and well documented, but not perfect. However, even though the report is flawed, I do believe it is an accurate account of what happened on that terrible day. I agree with the report that Islamic extremist terrorists tied directly to Osama Bin Laden were responsible for the attacks of 9/11 and it was not (as many conspiracy buffs claim) a massive conspiracy spawned inside our own government to kill thousands of its own citizens.

Nevertheless, in trying to keep an open mind, I decided to visit some of the 9/11 conspiracy websites, just to see if there was indeed anything to their claims. In particular I was looking for intelligent theories backed up by research from unbiased investigators. Instead I found half-baked theories about bombs placed inside "government" airliners, explosive devices rigged days in advance (inside the twin towers), and missiles being fired from the jet liners. One of the more outlandish sites displayed video stills of what the photographer claimed were flying dinosaurs cruising by the World Trade Center!

That said, there are a few things that do bug me about the *9/11 Commission Report* that I do believe need addressing and fall under the scope of this column because they are communications related. For instance, It has come to light that after Air Force One was airborne and while the attack was still in progress, communications links between the President and the White House bunker (where VP Cheney was secured) were unreliable at best. According to press reports, when Cheney was talking to the President about the situation (trying to obtain permission to authorize the military to shoot down any other hijacked airliners) the line kept dropping out.

For decades we have been hearing reports of how state-of-the-art and reliable the communications aboard Air Force One are supposed to be. In fact they were designed to be able to work even during a nuclear attack, but on 9/11 they obviously failed big time. According to a report in *Vanity Fair* magazine, these communications failures *may* have forced Vice President Cheney into giving the order to shoot down hijacked aircraft on his own, which was something he had no power to do. Although the administration denies these claims and says it was the President who authorized the shooting down of hijacked civilian airliners, it does raise important questions about the reliability of high-level military communications and how they would work during another 9/11-type event or during even during more dire circumstances, such as a nuclear war.

GPS Spoofers?

Another glaring omission from the *9/11 Commission Report* I'd like addressed concerns how the terrorists navigated. All the hijacked aircraft flew many hundreds of miles away from their intended targets and on very strange looping tracks, yet they were still able to find the World Trade Center and the Pentagon without aid from ground controllers. Were the hijackers that competent in working the aircraft's navigation equipment or did they navigate by simpler means?

A short article that appeared in *Aviation Week and Space Technology* magazine may have answered this question. It seems that the Office of Homeland Security has employed GPS *spoofers* near sensitive government sites such as military depots, federal offices, and nuclear facilities. I live near such a facility and found this indeed to be the case. The spoofers work by tricking a GPS receiver into displaying erroneous information concerning speed and altitude data. When driving by a certain near-

by federal facility (I'll omit the name for security reasons), the GPS receiver I was using displayed that my car was traveling at almost 150 mph (more than double my speed) and at an altitude 50 feet below ground level! The spoofing seems to be very localized and only effective within a couple of miles of the facility. This leads me to believe the 9/11 hijackers may have used inexpensive GPS receivers, the kind available at any electronics store. If so, this raises other questions: were GPS units found during security searches of the hijackers, and if so why weren't they confiscated? Were any GPS receivers found in the crash debris of any of the airliners?

My guess is that either for security reasons (or simply because no one on any of the airliners survived to give us an eye witness account), we will probably never know the whole story.

Keep Your Ears To The Far East

A friend of mine, who is stationed in Japan at a classified military listening post, tells me that the next world-rocking international crisis will most likely be caused by North Korea.

"Josh" tells me that it is clear from the intercepted military, government, and civilian radio communications coming out of North Korea that the human suffering , starvation, and disease (caused by the Communist dictatorship in power) is leading to an inevitable stand-off with Western powers. Humanitarian aid is needed yesterday, and it is the intention of Kim Chong-Il to use his newly acquired nuclear and bio-chemical arsenal (and delivery systems) as a sort of blackmail, to pressure Western nations into lifting sanctions. Although experts are doubtful that North Korea's nuclear missiles could reach the continental United States, U.S. allies, such as Japan and South Korea, are well within the bull's-eye and are taking the threat very seriously indeed.

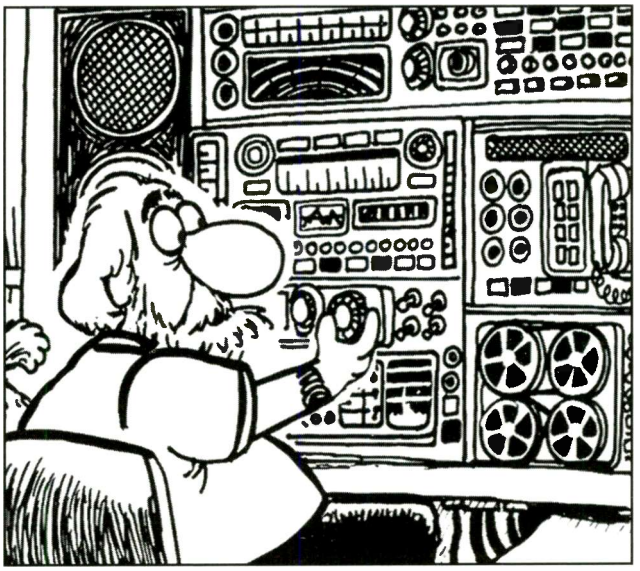
According to Josh, so far the only thing that gave Kim Chong-Il pause was the invasion of Iraq, which showed the dictator that America will no longer shy away from invading countries that threaten American interests. But meanwhile, millions of North Koreans will die soon unless something is done. Josh advises all serious monitors to keep an ear to the Far East.

Spy Post For Rent

Speaking of listening posts, two highly sensitive parabolic antennas once used by the Soviet Union to spy on western satellite communications are now available for rent. The two dishes and receiving systems (one a 32-meter dish and the other for 16 meters) are located in the village of Irberne, 290 miles north of Ventspils, Latvia. The Russians say the dishes can be used for a variety of purposes, including radio astronomy or SETI work. Scientists who have toured the site say these antennas have the best listening capabilities in Northern Europe. If you're interested in renting these facilities, e-mail Professor Juris Zagars at juris,zagars@venta.lv.

For Every Soldier, A Radio

Pentagon military strategists are pushing a plan to equip every ground-pounding soldier with a satellite-capable survival radio, enabling them to call for help if needed. Some in the Senate Armed Forces Services Committee say the plan is unrealistic, would cost over $660 million, and is a figure that doesn't include batteries or spares.



Cartoon by Pat McCarthy

Meanwhile some soldiers stationed in Afghanistan and Iraq are reportedly using inexpensive off-the-shelf FRS/GMRS radios that they brought from home or had shipped to them by relatives. Unofficially, soldiers can use them, but only if they're used for personal, non-military related communications and they understand that the enemy can intercept their communications or that their transmissions could trigger IED s (improvised explosive devices) inadvertently.

UFO Over Foggy Bottom

In October, Washington D.C. police were flooded with calls concerning a large glowing UFO seen flying in the vicinity of the White House. It turns out what they were seeing was an internally lighted American Blimp Corporation A-170 airship flying on a 24-hour endurance demonstration with the permission of local authorities.

The demonstration was part of a plan to convince military planners that a long-duration, on-station unmanned airship could fly for days over Baghdad or other urban combat areas, equipped with high-resolution video and radar sensors and radio interception equipment to intercept cell phone and low-powered walkie-talkie communicators like those being used by insurgents in Iraq. As detailed in the September 2004 issue of *Pop'Comm* ("Monitoring The Military's UFO Sky Spies") blimps are cheaper to buy, fly, and operate than conventional spy aircraft and can be equipped to avoid detection from infrared missiles, plus advocates say that they can't be seen or heard at night above 7,000 feet. One major drawback is their top speed (about 40 knots/hour); another is that they aren't safe to operate in winds above 30 knots.

Satellite Crypto Upgrade Competition

Rockwell Collins and L-3 Communications are engaged in a competition to see which company will win the job of upgrading the U.S. military's cryptographic equipment used on

nuclear mission-related platforms, such as the E-4B, E6B, B52H, and B-2 bombers. The $13.5 million program centers on the KG-3X cryptographic system and is part of the Minimum Essential Emergency Communications Network and the Fixed Submarine Broadcast systems. The production run of new cryptographic gear for these aircraft is expected to be almost 500 units.

B-3 Bomber?

USAF leaders have approached Pentagon planners with the idea of building an interim-long range strike system to bridge the gap between today's bombers and futuristic systems. Military futurists have started the wheels rolling by asking top aviation companies to propose ideas for a new strike aircraft.

Air Combat Command chief General Hal M. Hornburg says the new system should be manned despite the moves toward an air force based on unmanned systems. The USAF has said it would prefer this interim aircraft to be a stealthy mach 2-capable bomber with at least a 2,500-mile range, but it is researching multiple options, such as a platform that can "park" itself over enemy territory undetected or a hypersonic platform that could strike anywhere almost instantly.

In the meantime, new chromatic morphing-nanotechnology (optical-stealthy outer skins) and active stealth (radar spoofing electronic emitters) are being considered to help the current inventory of bombers cope with advancing enemy counter measures. The next aircraft (possibly designated B-3) could be fielded as early as 2015.

SETI Revisited

I received many positive e-mails about the recent series on SETI, "The Ultimate Intercept." Many said it was about time someone wrote an intelligent and realistic article about the science of SETI and showed just how immensely small the chances of receiving signals from an intelligent race in our universe really are.

I received a missive from Richard O'Neill who came to the exact same conclusions I did and writes on just how bleak are our chances of making contact (or even surviving long enough to shout our flicker-brief presence to the heavens as a species). Richard writes,

I was absolutely thrilled to read your article, "The Ultimate Intercept—Part 1" in the November *Pop'Comm*. Twenty-five years ago I formulated exactly the same theory as yours. Because of my educational background (I have a BA in zoology) combined with my interests in space studies, ham radio, SWLing, and aeronautics, I was, fortunately, well prepared for this idea.

I named my theory "Strobe Light" for reasons I see you are well able to understand as an argument that we will probably never make contact with extraterrestrials, no matter how many there are out there. Your ideas on digital radio put the final nail in the coffin.

The time and space numbers involved and the probable duration of any advanced civilization (if we compress the history of the Earth into 24 hours, we humans have only been capable of interstellar communications for the last couple of seconds) pitted against the chances our species will probably self destruct or be destroyed by astronomical forces (in another few seconds) and thus not surviving long enough to make contact. By the time we see their radio "strobe-light" blinks (from millions of light years away) the window has already closed for two-way communications. So far I have met almost no one who is capable or desires to understand this theory.

However, in light of this, I still sincerely believe the SETI effort is worth it because of the potential impact on human civilization.

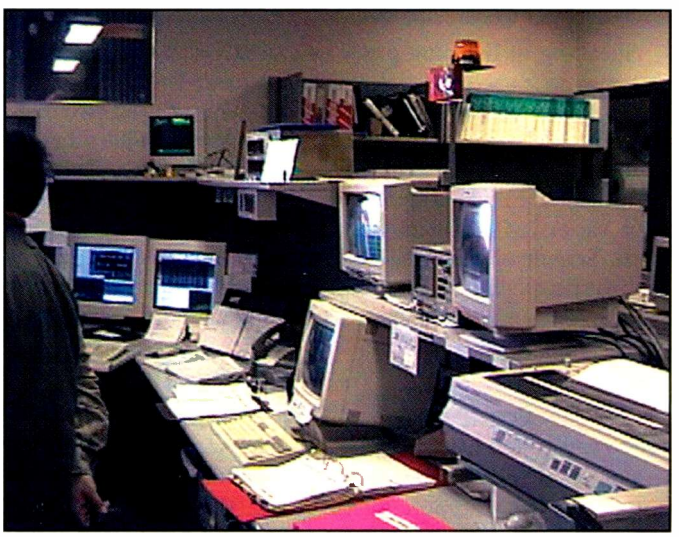
Very Large Tour

Partner in crime Ken Hanson (whose words have graced these pages on more than one occasion) recently had the unique opportunity to take an insider's tour at the Very Large Array radio telescope (mentioned in "The Ultimate Intercept") and promises to write us a brief account of what he saw in a future article. In the meantime, he sent me a few of the over 300 photos from his tour and they are printed here as a teaser.

Excalibur?

In stealth-chaser circles rumors are circulating about a possible new covert aircraft, known as Excalibur, flying out of Area 51. Also known as the "Q," some say it is a mach-5 spy plane or possibly a stealth fighter built by the Northrop Grumman's Phantom Works and based on technology developed during the Bird of Prey program.

One of the 27 steerable parabolic dishes of the Very Large Array located west of Soccorro, New Mexico. (Photo by Ken Hanson, WB5QLI)



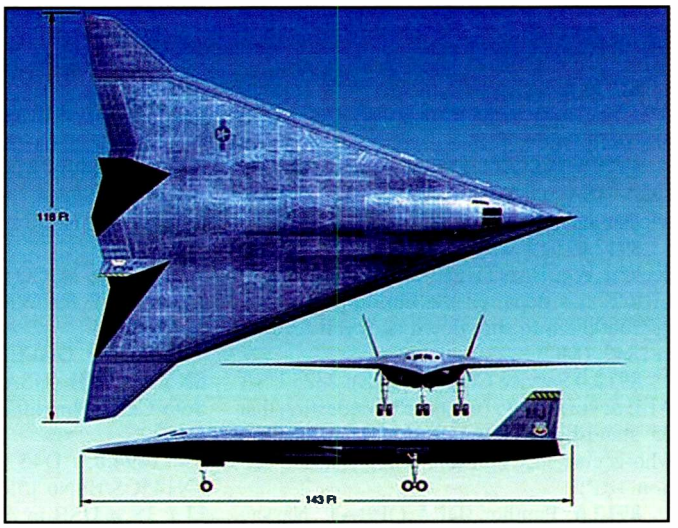
Inside the VLA Control room. (Photo by Ken Hanson, WB5QLI)

Mystery patch from a mystery black aircraft program. Could it be Excalibur? →

Recently a patch representing the program has been leaked to the aviation press. Usually this is a precursor to declassification. The patch shows a Merlin-type wizard holding the letter "Q" set against what looks like the plan-form of a delta-shaped aircraft with a stealthy-serrated trailing edge.

Other interesting aspects of the patch include the sword that matches the sword on the Bird Of Prey patch (that was also leaked just prior to declassification), what looks like a T-38 (maybe a chase plane?) with a lightning bolt ascending from it, and what looks like a parabolic dish antenna. What these images symbolize is not known. The patch has been seen on personnel attached to the 413th Flight Test Squadron based at Edwards AFB.

In a related item, Senator Pete Domenici (R. New Mexico) said at a recent ceremony at Cannon AFB, New Mexico (announcing the Pentagon decision to pour millions of dollars into new construction at the base), that Cannon would soon become the biggest Air Force Base in the southwestern U.S. and host to a new "still-classified" program. Could this program be Excalibur? Living only 90 miles from Cannon, I guess myself and other "interceptors" will have to keep our ears open. We'll let you know what we hear. Until next month, keep those utility loggings coming and your ears to the radios!



Just one of the supersonic concepts being eyed for the next generation stealth bomber.

Readers' Logs

3152.0: HALIFAX MILITARY wkg RESCUE 908 at 0816. (MC)

3316.0: GOLF FOXTROT, KILO, GOLF, and FOXTROT in Link-11/16 coordination net. Kicking data to DOG at 0014. (MC)

4372.0: M3N and 2VZ in Link coordination net at 2144. (MC)

4739.0: GOLDENHAWK calling WAFER 23 with No Joy at 0106. (MC)

5320.0: USCGC BELUGA (WPB 87325) wkg CAMSLANT for check on individual with resident alien ID card at 2131. (MC)

5422.5: OCEANA RADIO wkg various auxiliary stations at 2305. (MC)

5708.0: REACH 633 ALE initiated call to HILDA Meteo for WX at Ramstein at 0150. (MC)

5711.0: KING 22 (HC-130) clg ANGEL OPS at Moody AFB for radio check. KING OPS answers up instead at 2304. (MC)

5717.0: HALIFAX MILITARY wkg RESCUE 905 with message from RCC at 0158. (MC)

5717.0: TUSKER 323 (CC-130H, 14 Wing) wkg TRENTON MILITARY for p/p to Greenwood Wing Ops at 0139. (MC)

5732.0: 18C position report to PANTHER and passes info on two surface contacts at 0050. (MC)

6694.0: HALIFAX MILITARY wkg SURFACE 21 who requests they close watch and notify MOC at 0021. (MC)

6739.0: SHARK 89 p/p via Lajes HF-GCS at 0035. (MC)

6761.0: ETHYL 34 wkg ETHYL N1. ETHYL N1 is looking for REACH 130. ETHYL 34 wkg REACH 0185 to arrange AR at 2331. (MC)

7313.5: USAF MARS 2S1 Net with AFA2JX taking check-ins from AFA2RC, AFA2YR Tampa, AFA2UK Alabama, AFA2QD, AFA2CV Atlanta, AFA2CO North Carolina, AFA2BK Charlotte, AFA2IO, AFA2HX Richmond, AFA2II, AFF2T Florida, AFA2OC West Palm Beach, AFA2HR Orlando, AFA2QE Tampa, AFA2AE Daytona at 1204. (MC)

6640.0: ARINC New York: 2213 USB w/unidentified aircraft (call-sign missed) who is on the ground at JFK. ARINC requests that he pass the word to other aircraft that the 8-MHz frequency will not work this evening. New York is having trouble reading anyone on 8 MHz and tells the aircraft that the frequency for this evening will be the 6 MHz frequency. (RP)

6721.0 170043 (C-5 # 80-0043): 1748 USB/ALE sounding. (RP)

7313.5: USAF MARS 2S1 Net with AFA2JX taking check-ins from AFA2RC, AFA2YR Tampa, AFA2UK Alabama, AFA2QD, AFA2CV Atlanta, AFA2CO North Carolina, AFA2BK Charlotte, AFA2IO, AFA2HX Richmond, AFA2II, AFF2T Florida, AFA2OC West Palm Beach, AFA2HR Orlando, AFA2QE Tampa, AFA2AE Daytona at 1204. (MC)

7475.0: FREDGAS (Washington Gas & Light Company, Frederick, MD): 1612 LSB/ALE sounding. (RP)

7527.0: 18C wkg PANTHER to report TOI they are intercepting is heading towards Spanish Cay at 2201. (MC)

7635.0: HEADCAP 45 as NCS in CAP Chaplain's Net at 2110. (MC)

7635.0: HILL CAP 49 (West Virginia CAP), RED ROBIN 194 (Michigan CAP), MOCKINGBIRD 11 (Mississippi CAP), and FLORIDA CAP 815 in CAP net at 1416. (MC)

7778.5: AT1 (FBI, Atlanta GA): 1621 USB/ALE TO KC1 (FBI, Kansas City KS). (RP)

7839.5: CIP68C (Canadian military): 1231 USB/ALE TO CIP66 (Canadian military). (RP)

7839.5: CIP66 (Canadian military): 1227 USB/ALE TO CIP68B (Canadian military). (RP)

7839.5: CIP66 (Canadian military): 1224 USB/ALE TO CIP67A (Canadian military). (RP)

7839.5: LCT (unidentified Canadian): 1146 USB/ALE TO VIC (unidentified Canadian)—[AMD] BON MATIN. (RP)

8060.0: CUFAN1 (unidentified sub-element of Unified Command of National Armed Forces): 0102 USB/ALE TO CGGN (HQs, Venezuelan Nat'l Guard). (RP)

8060.0: CORE7 (Venezuelan National Guard Commander, Region 7): 0706 USB/ALE TO CUFAN3 (unidentified sub-element of Unified Command of National Armed Forces). (RP)

8060.0: AA1 (unidentified): 0437 USB/ALE sounding. (RP)

8171.5: T7Z101(7/10s1t Avn, Ft Campbell KY): 1450 USB/ALE sounding. (RP)

8171.5: KFMHNG (Nat'l Guard, Otis ANGB, MA): 1724 USB/ALE sounding. (RP)

8171.5: T2Z238 (2/238th Avn, IN NG Shelbyville IN): 1504 USB/ALE sounding. (RP)

81715.0: TC159 (Company "C," 1/159th Avn, Ft Bragg NC): 1805 USB/ALE sounding. (RP)

8971.0: Fiddle (TSCC, NAS Jacksonville): 1234 USB w/S4JG (P-3C on the ground) w/clear and ANDVT radio checks. (RP)

8912.0: 51A wkg PANTHER to report on deck at W4. PANTHER advises that MAVERICK has departed the building and they instruct them to shut down and wait for him at 1842. (MC)

8912.0 Service Center (BICE): 2325 USB ALE & voice w/05 (not heard) requesting that 05 stand-by for CAMSLANT Chesapeake who is currently in a link w/undisclosed station. (RP)

8912.0: Panther (DEA OPBAT, Nassau Bahamas): 2237 USB w/J03 (HH-60J #6003, CGAS Clearwater-not heard) in ALE & voice. Uses voice call Rescue 03. (RP) 8971.0: FIGHTING TIGER 22 with SPARE GROUP 5 report to GOLDENHAWK at 1941. (MC)

8983.0: OCEANA RADIO taking ops and position report from CG 2140 for relay to CAMSLANT at 1505. (MC)

9022.0: FOXTROT 22, TEXAS 33, OHIO 31 wkg STRIKESTAR (E-8 JSTARS) with line-by-line targeting and ordnance reports at 1952. (MC)

9025.0: REACH 6020 p/p via Andrews HF-GCS to Norfolk AMCC at 1736. (MC)

9081.5: T7Z101(7/101st Avn, Ft Campbell KY): 1442 USB/ALE sounding. (RP)

9295.0: SYRNY (Nat'l Guard, Syracuse NY): 1850 USB/ALE sounding. (RP)

9295.0: BNGNY (Nat'l Guard, Binghamton NY): 1651 USB/ALE sounding. (RP)

9295.0: T1Z159 (1/159th Avn, Simmons AAF, Ft Bragg NC): 1513 USB/ALE sounding. Also noted on 6911.5. (RP)

9295.0: RCHNY (Nat'l Guard, Rochester NY): 1940 USB/ALE sounding. (RP)

10242.0: LNT (CAMSLANT Chesapeake): 2046 USB w/J25 (USCG HH-60J #6025 CGAS Clearwater). In voice J25 gives position as 2800N/8332W. J25 has trouble hearing CAMSLANT and they go back to scan. (RP)

10242.0: CAMSLANT Chesapeake (very weak): 1828 w/6003 (HH-60, CGAS Clearwater-not heard) in ALE and clear voice radio checks. (RP)

10242.0: LNT: 1505 USB/ALE w/J01 (HH-60 # 6001, CGAS Elizabeth City). Then in voice J01 reports flight ops normal and they return to scan. (RP)

10272.0: CORE7 (Commander, Venezuelan National Guard Region 7): 2306 USB/ALE TO CUFAN3 (unidentified sub-element of Unified Command of National Armed Forces). (RP)

10780.0: REACH 637 calling CAPE RADIO for radio check at 2215. (MC)

10780.0: AIR TRANSPORT 300 wkg ASCENSION RADIO to report departure from Antigua en route Ascension at 2249. (MC)

10993.6: Sector Key West instructs N8J to contact SHARK 23 on VHF at 2318. (MC) 11175.0: SHARK 89 p/p via Ascension HF-GCS to SMASHER at Key West with ETA to Coronet Oak at 2136. (MC)

11205.0: SHARK 25 wkg SMASHER to report departure from Bogotá, Colombia en route Cartagena, Colombia. SMASHER reports positive radar contact on them at 1310. (MC)

11232.0: ASCOT 9450 wkg TRENTON MILITARY for WX at NAS Brunswick at 1335. (MC)

11410.0: GOFER 01 (C-130E) calling SKYWATCH (USARSO Flight Following, Soto Cano, Honduras) with No Joy at 1507. (MC)

11494.0: D45 (ICE P-3 AEW&C #N145CS/BuNo 155299, Jacksonville AMB, FL): 1834 USB in ALE and short encrypted voice (Parkhill) w/unidentified station. (RP)

11494.0: LNT: 1507 USB/ALE w/J13 (HH-60 # 6013 CGAS Clearwater) then in voice 6013 w/position report (missed). (RP)

10913.5: ME1 (FBI, Memphis TN): 1615 USB/ALE TO AT1 (FBI, Atlanta GA). Also noted on 11073.5. (RP)

10051.0: Gander Radio and New York Radio alternating with aviation WX in USB, 1921–2000Z. (CG)

11226.0 OFF (Offutt AFB): 1737 USB/ALE TO E30138 (E-3B AWACS # 80-0138, Tinker AFB). (RP)

12067: ADVANCE40 and ADVANCE41 with military exercise comms. Heard "hit by mortar," "hostile ground fire," and some type of coded msg. USB from 2250-2315Z. (CG)

12191.0: CLC51 (Local Communications Center, 51st Jungle Inf Bde, Venezuelan Army): 2238 USB/ALE TO PCRC5 Communications Command Post, 5th Military Region). (RP)

13257.0: CHALICE FOXTROT (E-3 AWACS) p/p via TRENTON MILITARY regarding software troubleshooting at 2221. (MC)

13927.0: EVAC 71352 (C-130J, MDANG) p/p via AFA4DD to CRAB OPS with ETA to home station at 2015. (MC)

13457.0: FAAZLA (Los Angeles ARTCC): 1504 USB/ALE sounding. (RP)

13500.0: 61B (Venezuelan Navy, LST "Capana" T-61): 2322 USB/ALE TO BNA (Naval Base "Amario"). (RP)

13907.0: 718 (USCG HC-130H #1718, CGAS Sacramento): 1847 USB/ALE sounding. Also sounding on 18594.0. 718 also in ALE w/PAC (CamsPac Point Reyes) on 15867.0; 18594.0; 20890.0 & 23214.0. (RP)

13907.0: CamsPac Point Reyes (very weak): 2234 USB in ALE & voice w/J08 (HH-60J #6008, CGAS Astoria-not heard). (RP)

14400.0: OLZ55 (unidentified Czech Embassy): 1457 sounding. (RP)

14396.5: AFA3HY, Shawnee, Kansas, NCS for a MARS net. Mostly chit-chat about weather and equipment. USB from 1740–1800Z. (CG)

15025.0: SLUG 01 (E-2C, VAW-78) wkg SMASHER regarding travel arrangements JIATF-South was to make followed by later position report to SMASHER from SLUG 01 and SLUG 02. Heard at 1553. (MC)

15025.0: SHARK 67 check-in with SMASHER reporting 1610Z departure from Guantanamo Bay at 1627. (MC)

15025.0: Smasher (US Southcom Flight Watch, Key West FL): 2025 USB w/Evergreen 423 (AMC Contract aircraft) who reports landing at unidentified Brazilian airfield (SBKO). (RP)

15867.0: D45 (ICE P-3 AEW&C #N145CS/BuNo 155299, Jacksonville AMB, FL): 1939 USB/ALE w/unheard station then into encrypted voice (Parkhill) comms. (RP)

15867.0: X51 (UH-60L tail # 94-26551 2-3rd AVN, Hunter AAF Savannah GA): 1517 USB/ALE calling OPB (DEA OPBAT, Nassau Bahamas). Also calling Panther in voice reporting position as 79nms on bearing of 300 degrees from checkpoint Bravo 6. (RP)

15867.0: CAMSPACPoint Reyes: 2245 USB in ALE & voice w/J05 (HH-60J #6005, CGAS Astoria-not heard) acknowledging position report. (RP)

17982.0 Aircraft 472 (O/M Portuguese): 2118 USB w/Tamoio (unidentified, Brazilian Air Force) w/flight information. (RP)

18018.0: Aircraft (O/M SS): 1314 USB calling Merino w/no response. LAN Chile LDOC. (RP)

18018.0: Architect RAF Flight Watch: 1315 USB w/unheard station passing WX for Papos International, Cyprus. (RP)

18396.0: CER11 (French MFA, Paris): 1751 USB/ALE TO RABAT (French Embassy, Morrocco). Also noted on 14671.0. (RP)

18480.0: OLZ69 (Czech Embassy, Cairo?): 1713 USB/ALE sounding. (RP)

18594.0: CAMSLANT Chesapeake (not heard): 1858 USB w/CG 1504 (HHC-130 CGAS Elizabeth City) w/ALE handshake and clear voice radio checks. (RP)

18594.0 J13 (USCG HH-60J #6013 CGAS Clearwater): 1836 USB w/CAMSLANT Chesapeake in ALE and voice reporting flight ops normal. (RP)

18594.0: Unidentified aircraft (probably ICE P-3 AEW&C #N142CS/BuNo 153452, Corpus Chrisiti AMB, TX): 19108 USB w/unheard station stating they have been trying to contact PR1 (Punta Salinas, PR) in ALE. Then into extended encrypted voice (Parkhill) comms w/the unheard station. (RP)

19103.5: SKYWAT (SKYWATCH US Army Flight Watch, Soto Cano AB Honduras): 1422 USB/ALE sounding. (RP)

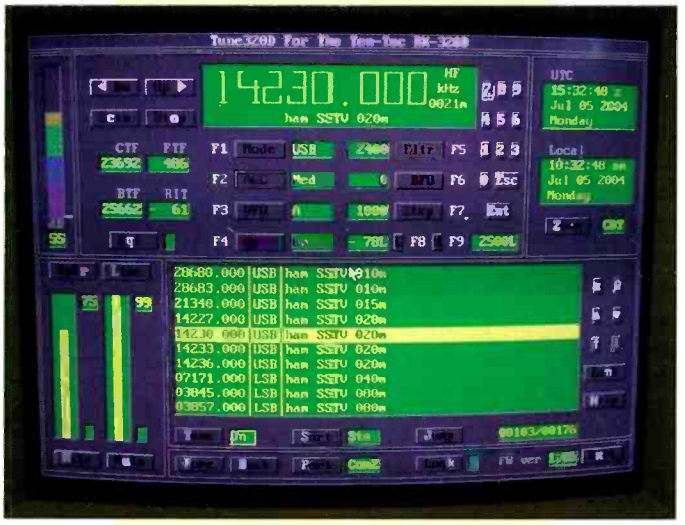
263.100: Suitor 03 talking to Washington Center after practice approach at CHO. Center asked if they were in a standard formation. Passed off to next controller on 284.700. AM 15:40. (GG)

284.700: Suitor 03 talking to Washing Center. Recd clearance to FL280, passed off to next controller on 351.900. AM 15:44. (GG)

This month contributors are Mark Cleary (MC), Charleston, SC, Ron Perron (RP), Chris Gay (CG), and George Grotz (GG). Thanks to all.

by Joe Cooper, carm_popcomm@hotmail.com

Assembly Language Programming: How One Reader Wrote His Own Program!



This is a shot of the RX-320 control program, called "Tune320D," written by Joseph Roby Jr. KØJJP. It's an especially interesting project as he used assembly language rather than some of the more conventional programming techniques. The picture looks curved because he photographed his computer monitor. The program's features are described in the sidebar to this month's column.

Good news everyone! The past year's worth of columns where I focused almost entirely on technical theory is now over. We can now move on to the more practical applications of computer hardware and software technology to assist us in our radio monitoring. What's really important now is to learn how to apply all of that new knowledge to your own situation. For the next series of columns, I'll be focusing on product information—what's available, how good is it, and how to make it work. More specifically, we'll look at computer-compatible radios and accessories, including a wide range of radio types, like scanners and specialty radios, plus the new generation of wideband spectrum monitors.

There have been some significant changes in radio design, particularly in the field of digital signal processing (DSP). As I've shown you already, many radios today are really just small computers—often on a single chip—which create virtual components and circuits out of built-in computer programs. If there's one thing you've learned from my columns over the past year, I hope it's that the age of "homebrew" construction is far from over, despite the big changes in radio technology. While many of us may not be using soldering irons as much as we used to, there's still a lot of opportunity to build a state-of-the-art radio monitoring station with our own hands; it's just that the tools we're now using are based upon computer software and hardware, rather than electronic components.

Again, if you've been reading my columns, you also understand another important point about computer-assisted radio monitoring: most of the software tools you need are either already present in your computer's operating system (such as Microsoft Windows) or are easily found on the Internet. More importantly, some of the best software available for radio monitoring is free! Even today's commercial software programs are

Here's KØJJR's ham and radio monitoring shack. The photo clearly shows what can be done with a well-designed collaboration between computers and radios. The three computers shown are used as follows: (Left) The MS-DOS computer controls the RX-320D with the assembly language program described in the article (Tune320D); (Middle) This computer is connected to his Ten-Tec Jupiter transceiver. The computer controls the Jupiter with a program he wrote in Visual Basic called Tune538. He also has a computerized log on this computer that he wrote in the same programming language and had dubbed "LogRxTx." (Right) This is the computer used to connect to the Internet and also controls a Uniden BC780XLT scanner. The scanner program is also written in Visual Basic and is called Tune BC780XLT. Note how he has nicely racked the radios to keep them accessible, but out of the way. This makes sense because the actual control of each radio is now taking place at the computer stations.

Homebrewing Software For A Computer-Controlled Radio

by Joseph Roby, Jr., KØJJR/WPZH964

One of my priorities with this column is to encourage contributions by its readers. This month I have the pleasure of presenting this submission by Joseph Roby Jr., KØØJJR, who resides in Duluth, Minnesota, where he practices law. Joe only recently joined the ranks of ham radio operators, receiving his ticket in 2002. He was 50 years old when he achieved that goal, so no excuses from those of you who claim to be too old to become a ham! Always one to rise to a challenge, Joe upgraded to Extra class by February 2003. He's been active on the air, having achieved WAC, WAS, and DXCC, mostly in digital modes.

Joe started out with a B.S. in mathematics and put himself through law school as a computer programmer and systems analyst. He has also applied his mathematical skills to computers. Joe's combined his computer skills with his interest in radio and his excellent computer-assisted ham/radio monitoring station has been the result. Not only has he hooked up some nice hardware, he's also written some of his own software. More impressively, he's created this software in a very sophisticated way by using a high-level programming technique called "Assembly Language." (See "Glossary" at the end of this section for more on this term and others used here.) I'm going to let Joe explain what that is himself, as he's definitely the expert on that topic.—jc

The marriage of radios and computers has led to a renaissance in the monitoring and ham radio hobbies. Those of us who drifted away from radio years ago to focus on computers are coming back to the hobby, thrilled with the ability to control our radios with computers. But controlling the radio with a computer is only half the fun. If you want a real challenge, write your own radio-control software.

In his "Computer-Assisted Radio Monitoring" column, Joe Cooper recently introduced you to the idea of homebrewed radio-control software. Joe has invited readers to submit stories of their experiences with the subject, and I responded with a brief account of the software I developed for the Ten-Tec RX-320D "black box" HF receiver.

Three things attracted me to the idea of writing a control program for the RX-320D. First, Ten-Ten has released to the public the command codes for the RX-320D. Easy access to the those codes is an important starting point. Some manufacturers won't make their command codes available, which, of course, makes it exceedingly difficult, if not impossible, to write control software for the radio. Second, I enjoy programming in assembly language. Assembly language gives the programmer great control over the program logic and produces very small programs. I thought it would be a fun challenge to control a radio with an assembly language computer program. Third, I've been maintaining an MS-DOS computer from the mid-1990s. It's a dinosaur by today's standards, but it's fun to keep it running. Because the RX-320D's baud rate is very slow (1200), my old MS-DOS computer could easily keep up with the radio. A radio-control program would put my old computer to some good use.

Having decided to proceed with the project, my first job was to study and thoroughly understand the RX-320D's commands. There are seven of them: Put Mode, Put Filter, Put Volume, Put AGC, Put Frequency, Get Signal Strength, and Get Firmware Version Number. These commands can be directly implemented by software. For example, I wrote code to change the RX-320D's frequency with the computer by using the Put Frequency command. As another example, the Get Signal Strength command allowed me to write code for a signal strength meter, which bounces up and down in real time as the signal strength changes.

A program that did nothing more than implement the seven commands would fall far short of exploiting the capabilities of the RX-320D and the computer. With a little imagination, though I could see that the seven commands imply many other ways to control the radio. For example, the Put Volume command allows the software to control the RX-320D's audio volume, including the ability to mute the volume. The Get Signal Strength command allows the software to retrieve the RX-320D's instantaneous signal strength. These two commands taken together imply something else: the ability to control the radio's squelch. Software can be written so the computer retrieves the signal strength on a regular basis. If the signal strength falls below a user-defined level, the software can send a command to mute the radio's volume; in other words, close the squelch. If the signal strength rises above the user defined level, the software can send a command to un-mute the radio's volume; in other words, open the squelch.

The virtually unlimited memory available in a computer suggests many other possibilities for implied commands. For example, the ability to store frequency, mode, AGC, filter, and other settings in a computer file implies the ability for the software to control the RX-320D for searching and scanning and for station pre-sets. In fact, the more I studied the RX-320D's seven commands, the more possibilities I saw for implied commands. I realized that with software and computer memory I could control the radio in ways far beyond what the seven commands would allow, in and of themselves. Some of these ideas came to me when I was deep into writing the assembly language code.

The Most Difficult Part: What The GUI Should Look Like

After familiarizing myself with the RX-32D's command set, I next considered what the graphical user interface (GUI) should look like. This, I must admit, is the most difficult part of writing an assembly language program. I spent considerable time writing code for command buttons, mouse control, and other interface capabilities taken for granted in Windows-based programs. I was always guided by this principle: Design the GUI in such a way that some other person could understand and operate the program without any explanation from the author of the code. In short, write for the audience, not for yourself. This principle is immensely helpful, because it forces the code writer to organize and simplify to make the operation of the GUI self-explanatory.

Guided by this principle, I felt it was important for the GUI to display prominently the RX-320D's frequency at the top

center of the screen in a large font. Immediately nearby would be the command buttons for the most important functions, such as mode and AGC. Lesser items, such as the volume controls, were place towards the sides and bottom of the screen. I also made sure that every command could be accomplished by either keyboard or mouse action. For example, pressing the F1 key changes the RX-320D's receiving mode. Clicking on the mode command button also changes the mode. I also knew that any user would want the ability to enter the frequency from the computer keyboard keypad, so I wrote code for that purpose. And, any useful GUI must alert the user to any errors that might crop up while the program is running. When this happens, the frequency display is replaced with a description of the error.

In addition to implementing the RX-320D's seven commands, as well as the implied commands derived from them, I wrote code for other GUI features useful to the user. For example, the program displays the date, time, and day of the week in both UTC and local formats. This feature required the ability to set the user's time zone, so I wrote the appropriate code for that, too. I also wrote code for receive incremental tuning (RIT). By listening to WWV at a low and a high frequency and making certain adjustments, one can compensate for any small tuning error in the RX-320D. Additionally, I wrote code for a help file and for changing the background and foreground colors of the display.

The code writing reached the point where I could start testing the program. I soon learned, as have many other assembly language programmers, that getting the computer to "talk" to the connected device (in this case the RX-320D) via the serial port is a real chore. The serial port must first be initialized by the software. The software must then make sure that there is a device connected to the port and that the device is in fact an RX-320D. The software then must poll the RX-320D on a regular basis to get the instantaneous signal strength. The software must be able to divert from this polling to process other gets and puts in response to user keyboard actions and mouse clicks.

This capability required code to handle interrupts from the keyboard and the mouse. The software must be able to react (and not crash!) if the RX-320D is turned off or if the serial cable is disconnected. I eventually addressed all these contingencies, and the program stabilized as far as "talking" with the RX-320D. From then on, it was a matter of refining and testing all the user features on the GUI.

Making A Compromise

I had to make one compromise that I hope to fix someday. The program has the ability to read and display a disk file containing the frequency, mode, and alphanumeric description of my favorite stations and channels (I call this a "memory bank"). The user can easily call them up and switch from one to the other. Information must be entered into the memory bank, however, with the MS-DOS text editor. In other words, my program has no capability for entering this information. I have this on my "to do" list. Also on my "to do" list are adding pass band shift capability, a timer, and the ability to search frequencies.

As it currently stands, the program, which I call "Tune320D," is only 25,587 bytes in size. As I said, assembly language programs are very small. Even so, the program offers the following features:

- displays signal strength, both in digits and in a meter
- changes frequency up or down by the defined step
- scans frequencies by the defined step
- displays the three tuning factors used by the software (coarse tuning, fine tuning, and beat tuning)
- sets receive incremental tuning
- sets squelch level
- displays frequency in kHz, and also includes band (LF, MF, HF), wavelength, and alphanumeric description (if available from the memory bank)
- sets mode, AGC, VFO A or B, default filer, BFO, and step settings, filter, BFO, step, and RIT
- directs entry of frequency with either computer keyboard keypad or mouse clicks on keypad displayed on the screen
- displays UTC and local date, time, day of the week, and time zone
- sets speaker and line volume, as well as mute function
- displays favorite frequencies, modes, and alphanumeric descriptions from the memory bank and allows user to choose entries from the memory bank list
- displays help file
- sets automating tuning when scrolling through the memory bank list
- sorts the memory bank list by frequency or by alphanumeric description
- jumps to the selected entry in the memory bank list
- displays total number of entries in memory bank list and number of currently selected entry
- sets foreground color and background color
- sets serial port
- locks out keyboard
- displays firmware version
- and, finally, exits the program

This was a great project and a lot of fun. Actually, I shouldn't use the word "was" because, as mentioned above, I have ideas on how to improve the program and I'll have more fun working on them.

The program works well and makes shortwave monitoring quite easy. I've also written control software for the Ten-Tec 538 Jupiter transceiver using VisualBasic. And now that Uniden has made public the control codes for its scanners (see the August *Pop'Comm*, p. 5), I am beginning work on control software for the Uniden BC780XLT Trunk Tracker III scanner. It's all part of a great hobby: the combination of radios and computers.

Thanks to Joe Cooper for the opportunity to share my experiences.

Glossary

Assembly Language: Assembly Language is one step removed from programming in pure numbers, so it is very difficult to do with out special training. You need that training to have a good understanding of what takes place in each step of your Assembly Language so it will work properly in a computer. However, the results are a computer program that is very small, fast operating, and efficient.

Baud Rate: The speed of information being transmitted across a serial interface, expressed in units of bits per second (bps).

Command Codes: A combination of letters and numbers used by a computerized device to perform a task. It is generally embedded in a computer program and sent from a com-

puter to a computerized device (such as a printer or computer-assisted radio) over a cable.

Gets and Puts: Most input and output operations in computer programs are done by means of the "gets" and "puts" commands that are written into a computer program. A "gets" command asks for information (your name, for example), while the "puts" command puts something into a device (for example, printing your name on a printer after having gathered it using the "gets" command).

Interrupt: A signal informing a software program that an event as occurred, either in the computer or in something attached to it. When a program receives an interrupt signal, it takes a specified action (for example, if you press a key on a computer keyboard, it may appear on the computer screen). A good computer programmer will write a software program so that it will respond to computer Interrupts properly (called handling an interrupt).

Poll: A method of updating data in a system, where one task (a computer program) sends a message to a second task (a programmable device, such as a computer-assisted radio) on a regular basis, to check if a data value has changed (such as a signal level). If so, the change in data is sent to the first task (for example, the software notes the change in signal level and displays it on the computer screen).

Program Size: Computer programmers strive to make the computer software they write as small as possible. When a computer programmer says that a program is small, it means that it requires the least amount of computer resources in order to be of the greatest benefit for those who use it.

Visual Basic: A programming language and environment that allows rapid creation of user interfaces by dragging and dropping elements, such as buttons and controls. It was developed by Microsoft and is based upon the BASIC (Beginners' All-purpose Symbolic Instruction Code) language.

very reasonably priced, and certainly more "feature rich" than ever before.

Likewise, computer hardware, including the actual computers, is becoming increasingly inexpensive, simple to install, and easy to use. Today there is little or no excuse for anyone not to be able to set up an inexpensive computer system (remember that good used equipment is fine for radio monitoring applications). Remember as well that by using an inexpensive network card and hub, you can turn two or more computers into a home network. With a little more work you can listen to and remotely control your computer compatible radio over that network, or even from any place around the world where you have access to the Internet.

So if you haven't set up your own computer-assisted radio monitoring station by now, what's stopping you? Likewise, if you have one, have you really achieved the full potential of that computer and its operating system/software by learning as much about its functions and features as possible? Just in case you haven't, this month I want to introduce you to someone who has taken up that challenge and is now seeing the potential of his computer system fully realized. His name is Joseph Roby Jr., KØJJR/WPZH964, and it took him a bit of work and study, but that investment in time really paid off. See "Homebrewing Software For A Computer-Controlled Radio" for his story in his own words. May his example inspire you to enjoy computer-assisted radio monitoring to its fullest.

Coming Next Month

Next month I'll begin a new series of columns where I'll be looking at some of the available computer-compatible radios and their features. Some will be old friends; others are new kids on the block. Tune in next time to find out where the future of radio technology is taking us.

As always, I'm interested in any pictures you may have of your own computer-assisted monitoring station or stories about how you have built and run it. You can e-mail me with that information, or with any questions you may have, at carm_popcomm@hotmail.com. Though I can't answer general questions on computers, I'll be more than happy to help you with any issues raised in the columns. You can also write to me at "Computer-Assisted Radio Monitoring," PMB 121-1623 Military Rd., Niagara Falls, NY 14304-1745. I've also placed a list of the columns I've done over the past two years, along with a summary of the content, on the Internet. Please note that my personal webpage has moved to a new URL at www3.sympatico.ca/joe_in_ey. On that website I've also included instructions on how to purchase back issues of *Popular Communications*.

It was with real sadness that I discovered that the "Any Service Person" program for sending letters of support has been discontinued after nearly two decades. Unfortunately due to security concerns about new forms of terrorist attacks (the Anthrax scare comes to mind), the current regulations specify that only mail from a known-safe source, such as family members, will be delivered. As a result, I suggest that you refer to the U.S. Department of Defense's official webpage, "Defend America." They have a specific section at http://www.defendamerica.mil/support_troops.html that offers an amazingly wide range of practical and useful ways you can directly help our troops. In the upcoming months I'll point out some programs from that page so that you can help support our soldiers, both in Iraq and other locations around the world.

I'll see you again next month, but in the meantime, please consider sending me photos and a write-up on your computer-assisted station! ■

by Peter J. Bertini, radioconnection@juno.com

ESR Meters—Do You Need One?

Did you know that there's a relatively new and expensive device that can save countless hours on your service bench? I'm talking about capacitor ESR meters, small handheld testers that effectively measure capacitor ESR (equivalent series resistance). ESR is a dynamic measurement that shows the relative quality of a capacitor. An ideal capacitor acts like a purely reactive component, having no DC resistance. In the real world, all capacitors have ESR, because of how they are made, and manufacturing and material limitations. ESR only worsens with age as an electrolytic capacitor dries out.

Visualize ESR as a resistor in series with the capacitor. Although not entirely technically correct, you can think of ESR as being *AC resistance*. We expect a capacitor to block DC voltages with ease and pass AC signals with minimal attenuation. This means that a capacitor should have no measurable DC resistance (leakage) when measured with an ohmmeter, and it should measure a very low resistance when measured with an ESR meter, which measures the AC resistance of the capacitor.

I'm often asked if older electrolytic capacitors are worth saving and if a relatively new-in-box Sprague electrolytic capacitor made in the 1970s or later is worth reforming and using. These capacitors were made by a respected American company and they aren't cheap. We've talked about reforming electrolytic capacitors in past columns; the technique involves gradually increasing the voltage applied to the capacitor under test, while monitoring the current draw, until the capacitor is at its rated voltage and shows less than 500 µA of leakage current. Suppose the capacitor reforms properly and a capacitance meter verifies that its capacitance is within tolerance. Is the capacitor good to use? Maybe yes, maybe no.

ESR And Capacitor Aging

As an electrolytic capacitor ages, the electrolytic dielectric paste slowly dries out, causing the ESR to rise. Other problems, such as failing mechanical connections, can also lead to ESR related failures. If the capacitor is used as a bypass, the increased series resistance can cause oscillation problems in a radio, because it can no longer effectively decouple circuits from each other; or if used as a filter, the increased resistance can cause unwanted hum because of poor filtering.

A filter capacitor with high ESR is also prone to overheating and shorting. Even if the capacitor isn't shorted, and it passes leakage current tests, and it measures the correct capacitance, it can still be a very bad investment unless you know the capacitor's ESR value.

How ESR Is Measured

Modern ESR meters use a high-frequency AC signal, typically 100 kHz at 5 mV, to measure ESR. The high frequency ensures a relatively low AC resistance reading for most common electrolytic values, while the relatively low AC voltage allows us to measure capacitors in circuit; the low AC voltage is below the turn-on threshold for solid-state devices, such as transistors, ICs, or diodes!

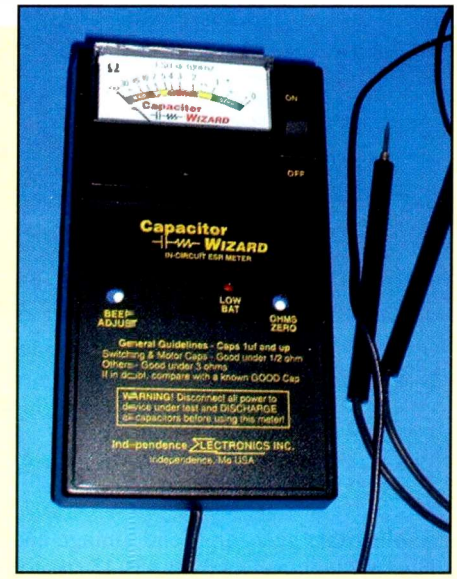


Photo A. The Capacitor Wizard is basically an AC ohmmeter that reads low value resistances. The 100-kHz 5-mV test signal permits measuring capacitor ESR in circuit.

Photo B. My Capacitor Wizard in action. Measurements taken on several new 10-µFd capacitors revealed a wide variation in ESR quality. The cap under test is reading around 5 ohms—in my opinion too much ESR to be acceptable, considering the other three capacitors measured around 1 ohm ESR.

I've been using a Capacitor Wizard in-circuit ESR meter for about two years, and it's the best $179 investment I've made in some time (see **Photo A**). There are several other ESR meters on the market, including a few lower-cost versions that might be more appealing to the home hobbyist. Ordering information is given at the end of the column.

ESR And Vintage Sets?

Besides filter capacitors, an ESR meter can provide a quick check of cathode bypass capacitors in audio power amplifiers. A cathode bypass capacitor should measure a small fraction of an ohm at the 100-kHz test frequency, and the cathode bias resistor value is much higher, so it wouldn't measurably affect the reading. Where an ESR really pays its way is for servicing vin-

Photo C. Here's a view showing how the replacement bypass capacitors were hidden inside the original Philco capacitor bank.

Photo D. The metal cover for the large Philco capacitor bank is back in place, hiding the replacement capacitors from view. Using electrolytic capacitors with high ESR values, instead of Mylar dielectric capacitors, to replace the original wax-paper capacitors caused low-frequency oscillations in the audio stages.

tage solid-state gear; high-end vintage audio gear is popular, I still use my vintage Heathkit AR-15 stereo receiver dating from the early 1960s. Vintage transistorized TVs and early transistor radios are hot collectibles—the first transistor radios came out in the mid 1950s, almost 50 years ago, and you can bet these sets all have more than a weak electrolytic capacitor that needs to be found and replaced!

How To Do It

If you do any computer monitor, television, or switching power supply repair, an ESR meter is indispensable. Using the ESR meter is easy: you simply place the probes across the capacitor leads (or at the solder pads on the pc board) and read the capacitor ESR resistance on the meter scale. The larger the capacitor value, the lower the reading should be. Most meters give some guidance in correlating different capacitor values to the maximum acceptable ESR for that capacitance. There's no fine line between good and bad—ESR is a relative quality—and often the circuit will determine the pass/fail ESR limits. When in doubt, compare the reading to a known good capacitor! Remember, the polarity isn't important, and the meter can measure the devices in circuit as well. Two caveats: make sure the equipment being tested is turned off and unplugged, and also make sure that all the capacitors are fully discharged before using the meter.

Not All Capacitors Are Created Equal!

I have to admit using the ESR meter was a real eye opener. I've made a lot of assumptions about all new capacitors being equal, but being actually able to measure the ESR of the new capacitors I've been using has revealed things I'd never expected! For example, a batch of new imported 10-µFd @ 450 volts electrolytic capacitors all measured around 10 ohms on the ESR meter! I'd expect these to be around 0.5 ohms or so. Not good—I wouldn't use those caps in my radios.

In another test, I compared three miniature imported 10-µFd electrolytic capacitors. The worst measured 5 ohms, the other two came in at a more acceptable 0.8 and 1.5 ohms. By comparison, a NOS vintage Mallory FP mount can-type electrolytic showed an acceptable 1.2 ohms ESR. On the other hand, all of the 1-µFd non-polarized Mylar capacitors tested measured well under 0.5 ohms! Whoa! You can see some of these capacitors being tested in **Photo B**.

I've had other folks with ESR meters tell me that they've found stocks of 30-year-old caps that had developed high ESR readings, making them unusable. If you have some NOS (new old stock) capacitors you want to use, you'll have to reform them, measure the capacitance, and as a last step, do ESR measurements to verify their true condition.

ESR And How It Affected My Philco 16B Radios

I've often experienced *motor-boating* problems (a loud, very low frequency rumbling in the speaker audio) in larger Philco radios, most notably in my Philco 16B 11-tube chassis sets. This can sometimes be attributed to badly mismatched 42 audio tubes in the push-pull audio output stage.

These radios used high-value paper capacitors for interstage decoupling, especially in the biasing and audio B+ areas. The caps were housed as a single assembly in a rectangular metal can. These can be gutted and restuffed (rebuilt) with smaller modern components, as shown in **Photos C** and **D**. Most restorers, myself included, would probably use a lower-cost electrolytic capacitor to replace a paper capacitor with a value of 1 µFd or greater. Therein lies the problem.

The original Philco paper caps probably had low ESR when new, on a par with modern Mylar dialectic capacitors. Substituting electrolytic capacitors, with comparatively *high* ESR values, caused all manner of unwanted coupling between the audio stages, resulting in motorboating and other problems. Replacing the electrolytic caps with Mylar caps solved the problem. (I bet a light is going on for a few readers right about now!) Remember, you can always replace a polarized capacitor with a non-polarized capacitor; the non-polarized capacitor

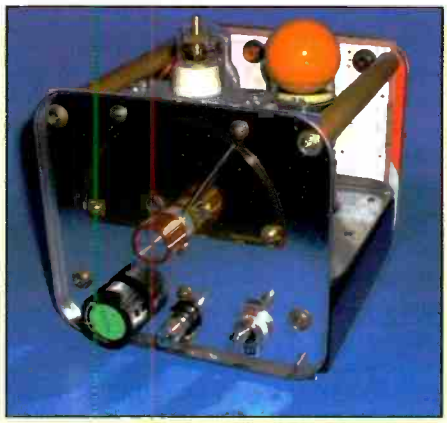


Photo E. Front panel view of Bob Ryan's modern version of the Boy's First Receiver. Note the clever protractor dial scale.

Photo G. Rear apron view shows the batteries mounted in metal Keystone brand battery holders. Four 9-volt batteries provide the B+ for the regenerative detector and audio stage. A single D cell is for the 1H4 battery triode tube 1-1/2 volt filament.

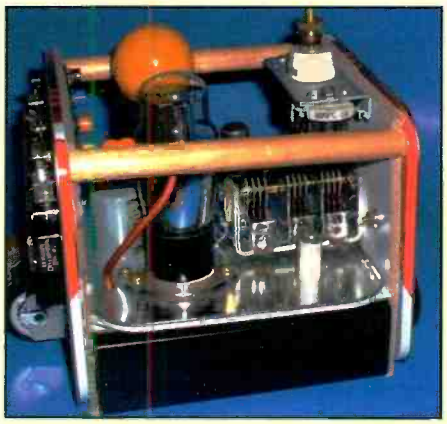


Photo F. Here's an oblique side-view showing the chassis construction. Most of the parts are high-quality military surplus items. An array of pin jacks on the top of the rear apron permits selecting the optimum B+ voltage for best regenerative action.

Photo H. Here's a set of finely crafted four-pin plug-in coils for the Boy's First Receiver. Reader Bob Ryan also made these coils.

will be physically larger and more expensive, but will also last forever and perform better in many circuits.

Reader Assistance

From our mailbag come a couple of requests for assistance.

Reader Nick Karin from Indiana is restoring a vintage Hallicrafters model 514 television and is seeking a good 7JP4 picture tube. I've checked around and came up empty handed. It looks like these are becoming as scarce as hen's teeth, and having one rebuilt is cost prohibitive. If anyone can help Nick locate a good 7JP4, drop me an e-mail, or write, and I'll get you folks together.

From Georgia, reader Ira New, Jr., reports he's busily restoring a 9H079R console radio—a Zenith 1946 console/record player combo that also has the FM band. Ira ordered the schematic for the radio, but is stumped by a small sub-chassis with a single 7F7 loctal tube that's missing from the radio schematic. Here's the scoop: Record player data was typically located at the very back of the *Rider* volume for that particular model as an addendum, and you'd even have to research the phonograph information separate from the radio section. The small subassembly is associated with the phonograph and provides a preamplifier section and phono-oscillator (miniature transmitter) to play the phonograph record through the receiver! A schematic is on the way to Ira.

Bob Ryan's Radio Challenge!

Our version of Alfred Morgan's "A Boy's First Radio" project is still gener-

ating mail and comments from readers asking about information on finding back copies of those issues. You can contact *the Popular Communications* subscription office by calling 800-853-9797 or e-mailing them at circulation@cq-amateur-radio.com

Bob Ryan is one of our frequent contributors, so we've become accustomed to exchanging letters and I'm often the recipient of vintage radio-related material uncovered by Bob. While Bob and I were corresponding on our version of Alfred Morgan's classic receiver project, the postman delivered a large box containing the little one-tube receiver shown in **Photos E**, **F**, and **G**! Wow! I was pretty impressed with Bob's creation, and I understand he's made a few of these cute little sets and passed them out to other friends! Bob had completed mechanical construction, challenging us to finish the wiring the radio as we saw fit. I haven't done so yet, but I'll run a short write-up once I do. I'm also going to track down its brother, and see if I garner photos of how that one turns out as well. I'm tempted to use a dual-triode-type 19 *battery-set* vacuum tube, with a regenerative detector and one stage of audio to drive headphones. Bob was elusive about doing a write-up on how he puts these little radios together, but he commented that his goal was to make the design contemporary, using readily available materials and components that would be used by a modern day builder.

I particularly liked Bob's front panel. Bob cleverly adapted a protractor scale for the dial logging scale and uses a surplus vernier-drive tuning capacitor from Fair Radio Sales for tuning. The dial pointer mounts on a metal piece salvaged from a Bakelite knob insert and uses one of the two setscrew holes to mount the metal dial pointer. Bob even included the set of batteries seen in the Keystone metal holders on the rear apron of the receiver.

I also asked Bob about the four-pin coil set that accompanied the radio, as I was impressed because they really looked commercially made they looked and I wondered how they were assembled (see **Photo H**). Bob reported that he's unfortunately exhausted his sole source for the new, unused four-pin bases, and he also commented that it took considerable machining to fit the clear plastic coil-form material into the four-pin bases. Bob is a master craftsman when it comes to one-tube radios!

Bob builds these sets (and others) in his apartment in California, and I know he'd love to correspond with readers with similar interests. I'd think he'd share some of the construction secrets if you write and ask. I'm passing along his address, so please drop him a line and say hello! Bob doesn't own a computer, so all correspondence should be done via U.S. mail. You can write Bob Ryan at 1000 S. Gilbert St., Apt. 132, Hemet, CA 92543.

Get In Touch

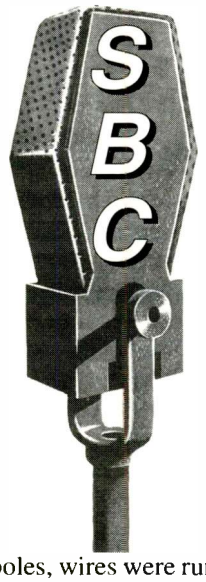
Well, that's a wrap for this time, until next month, keep those soldering irons warm and write in with your comments, column suggestions, problems, and ideas! ■

Ordering Information

The Capacitor Wizard is manufactured by Independence Electronics and may be ordered from Howard Electronic Instruments, 974 S. E. Pioneer Rd., El Dorado, KS 67042; Phone: (800) 394-1984; Web: www.heinc.com. Price class is $179.95 list, but watch for special net pricing. As of this writing, the Wizard was being offered for $159.95 on the website.

by Shannon Huniwell, melodyfm@dreamscape.com

A Little Something About America's Shortest Shortwave, And A Bit More



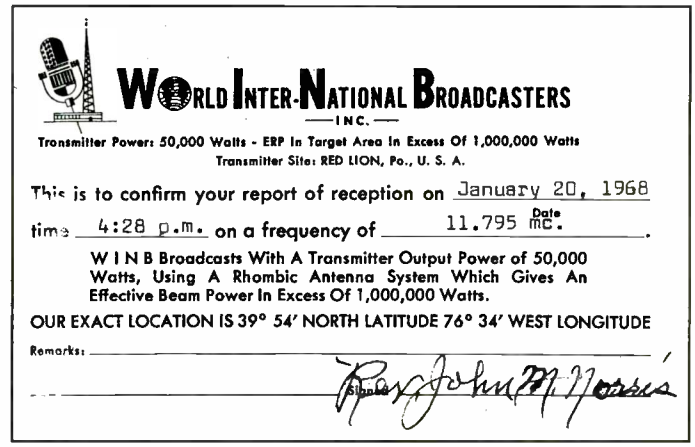
This is one of those stories remembered more from hearing it a million times than from actual recollections of the event. I can vouch for the fact that it did happen, though, as I do vaguely remember a winter Saturday in 1979 when my father took me to see one of America's most unique commercial radio stations, WINB-SW, that suffix standing for shortwave.

Truth be told, even with my eyes tightly closed and full concentration focused on that afternoon off a rural road a couple of miles out of Red Lion, Pennsylvania, I can only picture three things about the excursion. First, in back of what looked to be a big chicken house, there was something reminding me of a tall, crazy electric fence. Suspended from old telephone poles, wires were running here and there. It was an ideal meeting place for birds. "That's the WINB rhombic wire antenna," dad pointed when he noticed me gazing at the maze. Second, when we tip-toed—unannounced, of course—into the WINB studio, its sole authorized occupant was a rather startled teen who didn't seem to have any answers to my father's rapid-fire queries about shortwave radio. He was able to report, though, that at the time, WINB's transmissions were being beamed to Africa. And, third, I seem to recall being surprised that the taped talk being hurled (by WINB's 50,000-watt transmitter) over several continents was coming from a small cassette player piped into the facility's modest control board.

There was the instance when *guess who* hinted to the boy that "it sure would be a big thrill for my daughter Shannon if you'd let her read a station ID or some little thing over the mic so she could tell her geography class that she talked to people way over in Africa." He just smiled and shook his head. Dad then wondered aloud if WINB got lots of mail and proudly indicated that he could usually pick up the station in Connecticut. The teen said something about them getting "tons of foreign letters." My father couldn't resist quipping "WINB employment would be ideal for someone who enjoyed broadcasting and stamp collecting." The kid politely chuckled and then suggested we'd get more of our questions answered by walking across the field to WINB's sister outlets, WGCB and WGCB-FM. "And, oh yeah," he offered as we were almost out of the studio, "along the way you'll see a long, tubular object on saw horses. Be careful not go too near. That's the Channel 49 television antenna we'll be putting up to get WGCB-TV on the air."

A Short WINB Shortwave History

In 1957, Reverend John M. Norris was asked by a ministerial colleague if it would be possible to get government authorization to broadcast far greater distances than Norris' small Red Lion, Pennsylvania-AM outlet could transmit over. Norris hesitated a bit because venturing into shortwave transmission—then the only way to reach an international audience—seemed exotic and fraught with red tape. When looking seriously into the matter of securing a shortwave construction permit (CP), however, he was pleased to learn that the paperwork didn't include much more procedure than the average standard broadcast application. Commission officials indicated that among the only prerequisites for licensing an American international facility was a transmitter power of least 50 kW and utilization of a directional wire antenna array to multiply that output (effective beam power) for pinpoint beaming to specific areas of intended reception.



WORLD INTER-NATIONAL BROADCASTERS
—INC.—

Transmitter Power: 50,000 Watts - ERP In Target Area In Excess Of 1,000,000 Watts
Transmitter Site: RED LION, Pa., U. S. A.

This is to confirm your report of reception on January 20, 1968
time 4:28 p.m. on a frequency of 11.795 mc. (Date)

W I N B Broadcasts With A Transmitter Output Power of 50,000 Watts, Using A Rhombic Antenna System Which Gives An Effective Beam Power In Excess Of 1,000,000 Watts.

OUR EXACT LOCATION IS 39° 54' NORTH LATITUDE 76° 34' WEST LONGITUDE

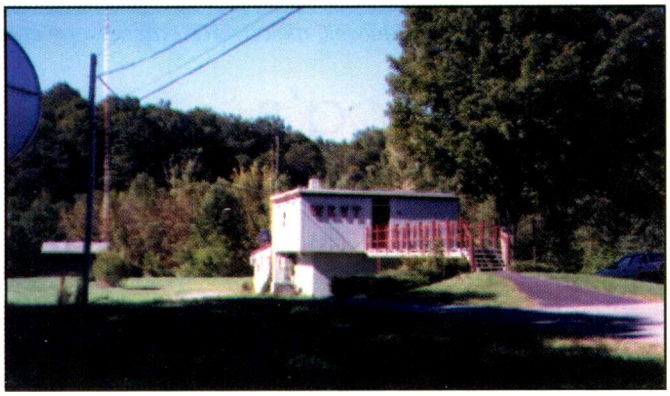
Remarks:

Signed Rev. John M. Norris

Always known by SWL fans as a "reliable verifier," WINB still faithfully rewards reception letter writers with a nice QSL card. My dad got this one in the late 1960s. By then, owner Rev. Norris indicated his calls stood for World Inter-National Broadcasters as opposed to the original World In Need of the Bible connection. Note that the card estimates the WINB "effective beam power" as greater than a million watts! Over the decades, several QSL styles have been issued, including a most recent American flag motif.

The Cold War being in full bloom as Norris filled out the shortwave application, he and many of his supporters figured that the godless, communist Soviet Union was in the greatest need of hearing the proposed station's planned religious programming. Reportedly, though, the minister was immediately advised by FCC people to set his sights elsewhere. In a 1972 *Journal of Broadcasting* piece on WINB, author Don R. Browne recalled Norris telling him that Commission officials instantly "claimed that no frequencies were available for this region." It may have been that CIA-types, Voice of America big wigs, or others highly placed in the U.S. government had reservations about some guy in bucolic Pennsylvania treading on prime VOA and Radio Free Europe territory.

Whatever the reason, Commission staff essentially said to Norris, "Instead of requesting targeting Russia, you've just



My dad sent me this snapshot of WKVT (1000-watts/1490 kHz) Brattelboro, Vermont, that he took while sightseeing with my mother in northern New England some years back. He stopped by "to talk radio for a bit," but my mom (who had been waiting in the car for about a half-hour) playfully started tooting the horn to signal S-O-S in Morse code! So, besides chatting with an engineer who happened to be "checking the meters" that day, all he found out was that WKVT began in 1959 with 250 watts as a sister station to WKNE at Keene, New Hampshire, and originally rebroadcast some WKNE programming.

decided to ask us if you can broadcast to northwest Africa and southern Europe, and you've made a wonderful decision." He took the hint, amending his application accordingly. Norris then filed a statement promising that the proposed shortwave would "present the points of view and attitudes on questions of international significance which fairly reflect the position of the United States...and present the American way of life and [allow the] use of the facilities...to all qualified persons on a fair and equal basis." To make an ever better impression on the FCC, Norris then visited the head of Voice of America so as to demonstrate "a sincere desire to cooperate with the program of the VOA." The strategy worked well enough for a CP to be granted and Norris' desired callsign WINB (World In Need of the Bible) was assigned circa 1960. A bank loan was secured for equipment such as the triple-wire rhombic antenna system and a 50,000-watt Continental transmitter. With this gear installed, and with the fashioning of a modest studio/control room in the aforementioned former farm building, WINB first took to the shortwaves during the fall of 1962.

Can You Hear Me Now?

Had *Popular Communications* been around in '62, the magazine would have no doubt received word from its shortwave listener correspondents that WINB was being received in the eastern United States and Canada, as well as in parts of Australia, New Zealand, Africa, the United Kingdom, and Europe. Up for historical question, however, is how many non-radio hobbyists purposefully and regularly dialed in the tiny international station for its program content. Browne reported "WINB never attempted to conduct a formal survey of its audience" and that BBC officials who frequently queried the general shortwave listening population "could not recall seeing any BBC survey where a single listener from [WINB's] target area had mentioned hearing the station." Even on our ride home, my dad speculated that the "tons of listener mail" touted by the teenaged control board operator was probably of lesser actual weight and all from SWL buffs simply hoping to get a verification QSL card from the obscure shortwave outlet. "Betcha dollars to donuts," he said, "that not one of those listeners had beforehand jotted down a note to themselves as a reminder to listen to a particular program on WINB!"

What's On Tonight?

This table gives a thumbnail sketch of Norris' typical mid-1960s program offerings.

Time (GMT)	Program
1700	Sign-on
1701	News
1705 [Mon-Thurs]	Music
1705 [Fri]	Voice of Truth
1715 [Wed]	International Christian Relief
1730	Music
1800	The "Morning Sunshine" show featuring music and scripture
1830	Faith Missions
1900	20th Century Reformation Hour
1930	Music
2000	Sign-off at 117720 kHz, and then sign-on at 11795 kHz
2003	News
2015	Music
2030	20th Century Reformation Hour
2100	Life Line
2115	The Great Plan
2130 [Mon]	Christian League of America
2130 [Tues]	America's Future
2130 [Wed]	Fun Time Jamboree
2130 [Thurs]	Dan Smoot Report
2130 [Fri]	Manion Forum
2145	Music
2200	Sign-off

If the program names—other than news and music—don't ring any bells, you're not alone. Most were taped religious fare originally recorded for air on small domestic stations, such as Reverend Norris' WGCB-AM. Browne's article indicated that many of the speakers on these programs had southern accents, spoke with a podium-pounding rapid pace, used colloquial terms, "American slang, folk sayings, and abbreviations" that would be completely mysterious to the average foreign listener. Even my father, who goes to great lengths to live by classic Judeo-Christian values, commented that he couldn't figure out what some of the speakers were talking about and wondered why WINB program producers didn't make an "international version" of their message so people in WINB's target area could better understand the message. The need for this modification was compounded by the in/out signal fade and whine of electrical interference that is the stereotypical province of shortwave transmission. "Just goes to show you," my father's still fond of saying (especially when commenting on the way mainstream media covers news and political issues), "while the political left is great at packaging lies, the right does a really lousy job expressing the truth!"

How Did WINB Keep Going On?

If, as Browne noted, its content presentation was tough for international audiences to fathom and the station's relatively

This engineer is looking under the hood of Gates' new 1966 Vanguard 1, a mostly solid-state, 1000-watt AM transmitter designed for stations like WGCB. The state-of-the-art unit was strikingly shorter than conventional "tube-type" transmitters. Actually, the Vanguard 1 had a 4CX-3000A tube to power its final amplifier, but the driver/modulator section was fully transistorized and offered low distortion and sound, which was said to approach FM quality. At $6,295, compared to $5,250 for Gates' standard tube-type kilowatt AM box, the Vanguard 1 was not a big seller. A retired radio chief engineer who e-mailed me about the pioneering solid-state unit admitted to being frustrated with the bugs that had to be worked out of a very early one his station manager bought at a National Association of Broadcasters show. The tech did say the Vanguard 1 paved the way for today's nearly carefree and easily adjustable 1- to 1000-watt AM transmitters.

weak signal, compared to government-operated shortwave facilities, made it more of a curiosity than an icon, what dynamic allowed WINB to stay airborne? Again, quoting my dad's observation on this question, "Reverend Norris primarily viewed WINB as a 'mission' (instead of a purely commercial enterprise), kept the station's operating costs low, and charged very reasonable rates for broadcast time." Even in the late 1960s when a dollar was worth a dollar, one could buy 15 minutes on WINB for as low as 25 bucks. Considering its modest facilities and the fact that WINB was only staffed by people "borrowed" (as were records and news copy) from Norris' AM/FM next door, it had relatively steady requests for QSL cards (perhaps sufficing as adequate proof of audience) and consistently attracted enough paid programming to allow Norris to tell Browne (circa 1970) "We aren't doing badly."

In fact, by the early 1970s, WINB generated sufficient funds for Norris to construct an antenna array for reaching South America and to buy a used GE 50-kW transmitter from WGY in Schenectady, New York. For some reason, however, the planned conversion of this behemoth from 810 kHz up to the shortwave band didn't happen. Had it been ready to go, the GE would have come in especially handy in 1995 when WINB's Continental transmitter broke down, taking the station off the air until it underwent revitalization in early 1997. Happily for radio enthusiasts, WINB can still be dialed today and has the distinction of being America's longest running commercial shortwave broadcast outlet.

WINB's Sisters

That 1979 trip to the mini international station was a bonus to my father's real reason for venturing to York County, Pennsylvania. He actually wanted us to see the little AM associated with one of broadcast law's most famous battles: The Red Lion Case. More about that later, though, as I thought we'd first get some WGCB background courtesy of an entry in the new *Broadcast Pro-File* catalog, which lists hundreds of available station histories and vintage photos. (Request a free copy today from *Broadcast Pro-File*, 28243 Royal Road, Castaic, CA 91384-3028.)

At 66 years of age, Reverend John M. Norris secured a CP for a new daytime-only standard broadcast station on 1440 kHz authorized to serve Red Lion. At the time, records show he owned 50 percent of the Norris Cigar Company. Prior to the late March 1950 grant, he'd estimated for the FCC that this facility would cost $27,200 to build. Norris, and his son, John H. Norris (who would serve as general manager), had their WGCB up and running in a studio/transmitter site on Delta Road (one mile east of Red Lion) for an October 22, 1950, debut. Its calls denoted World for God Christ and the Bible, reaching the York/Lancaster region with a religious format. Not enough of a WGCB paper trail exists to report much about the station during its first 10 years of operation, but 1960 saw the addition of WGCB-FM, prompting a studio/transmitter move to "a new site on the east side of State Highway 74, one and a half miles southeast of Red Lion." The FM also aired religious programming.

My memories of the place are vague but do include the notion that it was

CBS and Coca-Cola co-sponsored this colorful ad the year that WGCB debuted. The 1950 promotional piece suggested, however, that folks tune their car radios to fulltime affiliates of the Columbia Broadcasting System, as opposed to independently programmed daytimers, such as the Red Lion station. Note the grand old classic RCA model 44 microphone in front of ventriloquist Edgar Bergen. Also worthy of historical note is the flip-top "honor system" Coke cooler designed for a "golden rule" culture, prone to leaving a dime for whatever number of sodas they took.

As Rev. Norris contemplated building a religious-formatted AM in Red Lion, he was probably familiar with the conventional commercial programming of nearby WORK York, WGAL Lancaster, or maybe WKBO Harrisburg, Pennsylvania. Part of the then five-station Steinman chain, these local outlets were all NBC affiliates. Except for 1-kW WORK, each issued just 250 watts, but even a 1/4-kW operation could generate profits for advertisers when this 1948 Broadcast Yearbook ad was current.

anachronistic, indeed almost a time warp, compared to some of the other area stations we'd visited that weekend. A good size church organ in WGCB's biggest studio waited for a return to live music programs such as had been common in radio's bygone days. The rest of what comes to mind is a clean but dated facility with none of the typical radio decor (overflowing ashtrays, empty soda bottles/cans, dog-eared album covers, and posters of bands carelessly affixed to shopworn walls and studio doors) which was often the trademark of music radio stations and bohemian DJs who hung around or slept on a threadbare couch in the record library/jock lounge. Instead, the WGCB personnel encountered on our unannounced visit were mostly 1950s clean-cut, attired like extras in a Truman-era movie, and seemed cautiously polite. At first my father wondered if they were "real radio people," but when later considering that the WGCB staff included some of the only folks in the world to be associated with AM, FM, TV, and shortwave stations, he announced that they were "broadcasters" in the truest sense of the word.

A Truly Noteworthy Legal Challenge

Fifteen years before we toured WGCB, a commentator on one of the 1-kW facility's 15-minute paid religious programs insulted someone over the air. Though the guy didn't actually hear the jab, he found out and, well, the resulting ruckus went all the way the United States Supreme Court. At the heart of the matter was a Commission rule called the Fairness Doctrine. On its surface, giving people a chance to respond to negative comments broadcast about them is a worthy idea, but can it be enforced without making station owners feel like they're walking on eggshells every time issues are discussed? In official vernacular, here's how the justices viewed the situation in their 1969 decision: "The Red Lion Broadcasting Company is licensed to operate a Pennsylvania radio station, WGCB. On November 27, 1964, WGCB carried a broadcast by the Reverend Billy James Hargis as part of a "Christian Crusade" series. A book by Fred J. Cook entitled "Goldwater—Extremist on the Right" was discussed by Hargis, who said that Cook had been fired by a newspaper for making false charges against city officials; that Cook had then worked for a Communist-affiliated publication; that he had defended Alger Hiss and attacked J. Edgar Hoover and the Central

Intelligence Agency; and that he had now written a "book to smear and destroy Barry Goldwater."

When Cook heard of the broadcast he concluded that he had been personally attacked and demanded free reply time, which the station refused. After an exchange of letters among Cook, Red Lion, and the FCC, the FCC declared that the Hargis broadcast constituted a personal attack on Cook; that Red Lion had failed to meet its obligation under the fairness doctrine to send a tape, transcript, or summary of the broadcast to Cook and offer him reply time; and that the station must provide reply time whether or not Cook would pay for it. On review in the Court of Appeals for the District of Columbia Circuit, the FCC's position was upheld as constitutional and otherwise proper.

Not long after the Red Lion litigation was begun, the FCC issued a Notice of Proposed Rule Making with an eye to making the personal attack aspect of the fairness doctrine more precise and more readily enforceable, and to specifying its rules relating to political editorials. After considering written comments supporting and opposing the rules, the FCC adopted them substantially as proposed. The regulations (circa 1969) read as follows:

"Personal attacks; political editorials.

"When, during the presentation of views on a controversial issue of public importance, an attack is made upon the honesty, character, integrity or like personal qualities of an identified person or group, the licensee shall, within a reasonable time and in no event later than 1 week after the attack, transmit to the person or group attacked (1) notification of the date, time and identification of the broadcast; (2) a script or tape (or an accurate summary if a script or tape is not available) of the attack; and (3) an offer of a reasonable opportunity to respond over the licensee's facilities..."

Of course, such interpretation/notification/free response time requirements are incredibly cumbersome for broadcasters, especially those with a low-budget operation, and fail to bring truth into consideration. That is to say, if a program host called someone a "liar," technically, that would constitute an attack on the person's character. But is there a human being anywhere who has always told the truth? If not, then anyone could be branded a "liar." Defending a client against, or working with the plaintiff in such a conundrum would be a lawyers' "billable hours" dream.

By 1985, the FCC admitted that the Fairness Doctrine had backfired and was having a "chilling effect" on public issue coverage over radio and TV because broadcasters found it safer to avoid airing anything controversial about which someone might feel personally attacked. Two years later, Congress (one of the organizations most prone to criticism or "attack" via talk shows on radio and television) tried to strengthen the Fairness Doctrine. President Reagan, however, was no fan of legislation that made people afraid to criticize or question things, so vetoed and essentially sank the rules made famous (or infamous) in Red Lion.

So, What Happened To Fair WGCB?

After its court ordeal, the station was happy to drop out of the legal limelight and concentrate on local broadcasting. Founder Norris went to his reward at age 90 in early 1974. The family continued operating the miniature broadcast empire (boasting each branch of commercial broadcast service) until summer 1993, when it parted with the AM/FM operation for just over $2,800,000. Buyer Thomas H. Moffit, also owner of daytimer WVCH in Chester, Pennsylvania, used the company name Pioneer Broadcasting Corp., and eventually switched WGCB's calls to WTHM, conveniently including his initials. Despite the new moniker, WTHM still airs a religious format that would not sound unfamiliar to WGCB's original listeners, or to my dad and me as we caught about 45 minutes of it while heading home.

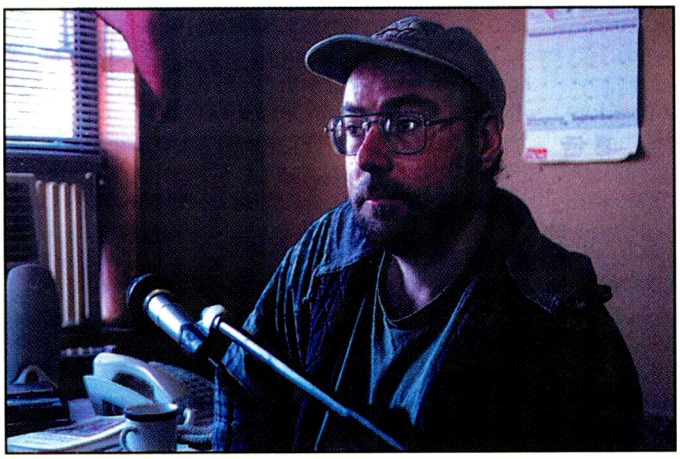
Because historical WINB and WGCI graphics are pretty scarce in my file cabinet, I hope you don't mind my giving color to this month's article by including a few unrelated radio station photos.

Do YOU Have Any Radio Memorabilia?

Remember, I'm always interested in hearing about your memories of radio's and TV's golden years. If you've got any old station coverage maps, photos, QSL cards, or letters, make a photocopy and send them along with your letter. My address is *Popular Communications*, 25 Newbridge Road, Hicksville, NY 11801 or you can e-mail me at melodyfm@dreamscape.com.

See you next time. And so ends another broadcast day at *Pop'Comm*... ■

Our February Winner: Congratulations To Jeff Copenhagen Of Wisconsin!



Here's Jeff Copenhagen of Washburn, Wisconsin, broadcasting on low-power FM station WRZC on the Red Cliff Chippewa Reservation.

Pop'Comm reader Jeff Copenhagen tells us,

Shortwave radio first came to my attention about six years ago when a friend told me about it. I've found listening to the BBC and Radio Netherlands, among other stations, to be an excellent source of news. I listen well into the night to both shortwave and AM radio. AM provides a great deal of interesting programming, especially talk and call-in shows from all over the country. Particularly, I listen to WBBM in Chicago quite frequently.

At this time I have a RadioShack DX-375, a Grundig 100 PE, and a set of Sony headphones. I also recently bought a Grundig S-350 AM/FM/SW radio, which I like very much. I'm 38 years old and a Licensed Practical Nurse in home health care and also co-host a radio show, called the "Gitche Gummi Hour," every Thursday morning at 10 a.m. on WRZC low-power FM, 92.3, broadcast from Red Cliff Chippewa Reservation in northern Wisconsin. Radio plays an important role in my life and I look forward to exploring the hobby more in the future.

Popular Communications invites you to submit, in about 300 words, how you got started in the communications hobby. Entries should be typewritten, or otherwise easily readable. If possible, your photo should be included.

Each month, we'll select one entry and publish it here. All submissions become the property of *Popular Communications*, and none will be acknowledged or returned. Entries will be selected taking into consideration the story they relate, and if it is especially interesting, unusual or even humorous. We reserve the right to edit all submitted material for length, grammar, and style.

The person whose entry is selected will receive a one-year gift subscription (or one-year subscription extension) to *Popular Communications*. Address all entries to: "V.I.P. Spotlight," *Popular Communications*, 25 Newbridge Road, Hicksville, NY 11801 or e-mail your entry to popularcom@aol.com

A Blast?

Note: This letter is in response to Bob Leef's "An Explosive Situation" item in our December Info Central.

Dear Editor:

In my experience as a licensed blaster and demolition contractor (one of my many careers), I have never experienced a premature detonation of an explosive device (i.e., an explosive charge primed with a primer and electric blasting cap) due to stray RF energy or radio transmission, that is, unintentionally. It is theoretically possible to do so, and I have been able to initiate electro explosive devices with a commercially available device, having done so with a commercial Motorola UHF HT and a mobile, vehicle-mounted CB.

In the case of the Motorola HT, this was conducted using a match head squib, essentially a hot wire ignition device with a small amount of pyrotechnic compound with a small amount of "dope" on a small metal bridge and filament (Daveyfire match head squib used to set off commercial fireworks), connected to 12 feet of small AWG copper wire. I was about five feet away and was able to "detonate" the squib by transmitting with the HT. I would not consider this to be a normal situation, as one would not be nearly this close to a match head squib in any situation unless one were planning for a failure of the match head and planning to set it off with a fuse or some other means.

The other instance occurred several years ago and involved a commercial blasting cap. This would also be considered an unusual event, because of the close proximity to the leg wires of a radio transmission device (a mobile CB), less than 20 feet. One would not normally (or sanely) have a blasting cap with the leg wires unshunted unless they were hooking up to the trunkline or shot pattern, and certainly wouldn't bring a vehicle into the shot pattern (n.b.: this was an experiment and not an actual shot that occurred) where such a high level of "ambient" RF would likely occur. More likely than not the cap would "cook off" and burn, rather than detonate.

I cannot vouch for the reasons for which IME has written these standards, although I believe that these are based upon the Bruceton tests conducted by the U.S. Bureau of Mines laboratory several years ago. The standards that govern use of RF equipment around electro explosive devices are fairly well founded, although likely represent a time when explosives were less reliable and quality control was poor. I can remember a time when DuPont was still in the explosives business (1986 or earlier) and made electric blasting caps with so much scatter within a single box that you questioned whether the delay period printed on the box meant anything (it may say the caps had a delay in 25 milliseconds, but it could have ranged from 10 to 50 milliseconds, which tended to really foul up your shot, changing the pattern and breakage of the rock).

The Franklin Research Center, a commercial laboratory located in Pennsylvania, has performed numerous tests for manufacturers over the last 30-plus years that have proven explosives devices (initiating devices) to be pretty fail proof under a wide variety of conditions and circumstances.

An aside: A blasting company in Ohio that I deal with even has cell phone towers on their property within 200 feet of their cap storage inside their fenced compound. This has passed muster with both the radio engineers who set up and maintain

the towers and transmission equipment, but also with the Bureau of Alcohol, Tobacco, and Firearms.

Today, the majority of powder companies use shock tube (a tube with explosive powder such as RDX or PETN dusted inside a long soda straw-like tube connected to the blasting cap), rather than electric blasting caps. The shock tube still can be detonated by large electrical pulses, such as through thunderstorms and current traveling along the ground; however, it remains a very safely engineered product that is fairly goof proof. Electric blasting caps have become more reliable and have a very low failure rate today. If they fail, they tend to not fire, rather than fire unexpectedly or fire due to outside influences.

Electronic blasting caps are now poised to replace electric blasting caps and shock tube due to their resistance to RF energy, as wall as their flexibility and ability to be programmed after the shot has been connected. However, their high cost, use of proprietary initiating systems, computers, and need for specific operator training have limited their acceptance.

Michael Stranathan
KC8WUC

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Approval: All ad copy is subject to Publisher's approval and may be modified to eliminate references to equipment and practices which are either illegal or otherwise not within the spirit or coverage scope of the magazine.

Closing Date: The 10th day in the third month preceding date of publication. Because the advertisers and equipment contained in Readers' Market have not been investigated, the Publisher of *Popular Communications* cannot vouch for the merchandise listed therein. Direct all correspondence and ad copy to: Attention: Classified Dept., PC Readers' Market, 25 Newbridge Rd., Hicksville, NY 11801.

by Bill Price, N3AVY

Cooking With Kleins

For some reason, I've been thinking about one of my more memorable home-cooked meals. But before you get your appetite all droolly for some delicious gourmet dish, though, I should tell you that I'm no gourmet cook. I might be considered the worst cook in the county, in fact, or perhaps even farther away than that. But I digress. It's a true story, about a day when I had to operate a satellite uplink, which was housed in a small building with no running water, but, of course, it had electricity. I knew I'd be in there for 12 hours with no chance of leaving (the uplink had to be attended when we were transmitting to the satellite), so I made sure I brought plenty of food and a few jugs of water. For me, "plenty of food" means two pounds of kielbasa, two packages of pop-n-bake biscuits, a two-pound block of cheese, a family-size bag of potato chips, some dip, 12 cans of soda, two cans of red beans and rice, and two nice big potatoes. At about 8:00 a.m. I started to get hungry, so I decided on some kielbasa and a potato.

A long time ago I bought a microwave oven for the uplink, because a person such as myself likes to eat several times an hour. With a microwave, my kielbasa/potato repast should have been a pretty simple culinary task, but I wasn't about to have an easy day. The oven refused to heat. It was probably a $10 diode, but I could not leave to get one, or anything else. After digging around awhile, I found an old toaster oven and figured my troubles were over. By now *I* was beginning to drool.

When I opened the desk drawer to look for my utensils, I had another bad surprise. A week ago, I had taken all the cooking and eating utensils home to wash and hadn't brought them back. I stepped outside to my truck and found nothing but my toolbag.

Little by little, I had upgraded all of my screwdrivers and pliers to "Kleins." Klein tools are somewhat of a legend with electricians (I myself am not one), and because I spent enough time hanging out with electricians, HVAC techs, and such, I had come to know the value of these great tools. Even though I'm sure the company recommends against it, "Kleins" (as their big lineman's pliers are affectionately called by their owners) take the place of an electrician's hammer, and probably a few other tools. I got myself the nice big lineman's pliers, along with an array of their screwdrivers, crimpers, strippers, large and small needle-nose pliers, and even cable cutters. I know that Klein doesn't advertise here in *Pop'Comm*, but their quality is worth a free plug any day.

Because we couldn't wash at the uplink (no water, remember?), I kept plenty of rubbing alcohol in the place. Some alcohol and some paper towels soon had my whole set of Kleins sterile enough for minor surgery. It was time to cook.

My folding utility knife didn't have a blade long enough to cut through the kielbasa or the potato, so it was back to the toolbag for my telephone lineman's snips and skinning knife. Much better. A little wipe with alcohol made that ready, too.

I had no aluminum foil, because we had been using the microwave oven exclusively, but I couldn't let the grease from the kielbasa drip into the bottom of the little toaster oven; I'd never be able to clean it. Not a problem for my Kleins; some flashing material—thin aluminum in a roll—would make a good drip pan, when scored with the skinning knife and bent with the big Kleins. The pan was actually impressive, and I have since washed it out and taken it back for future use.

I cut the kielbasa into pieces and roasted it in just a few minutes in the tiny 1500-watt oven. The long needle-nose pliers took the place of oven mits, and to save the top of the desk, I made a trivet of four screwdrivers to set the hot baking pan on while I took the kielbasa out and put it onto a paper plate. I wrapped it in some paper towels to keep it warm while I baked the biscuits.

The baking pan was already greased from cooking the kielbasa, so I popped open the exploding can of biscuits and spread them onto the pan and set the pan back into the tiny oven.

After a while, I noticed that the tops of the biscuits were getting pretty brown, while the bottoms were still more or less raw. This little oven was not made like the big one in my kitchen, and my poor biscuits needed to be turned, like pancakes.

My wire skinning knife lifted them off the pan, and a flip with the swivel screwdrivers put them right over on their backs without messing up their shape. I was thinking about contacting the Klein company, but I'm sure that product liability in today's litigious climate would mean they'd never publish my cooking tips; someone would blame them for burning their fingers on a hot screwdriver and that would be the end of their recipe division. But the biscuits browned on the bottoms, which were now the tops, and they were as good as any made at home. The big Kleins lifted the pan out of the oven, and the screwdriver trivet held them while they cooled.

As it turned out, I didn't have even a fork, but the small needle-nose pliers function a lot like chopsticks (sort of) and the skinning knife worked to cut the biscuits as well as spread butter on them. It later cut potatoes, which were skewed on a small phillips-screwdriver.

Later that day, I confidently cooked the red beans and rice (with melted cheese) and ate the potato chips and drank all the soda. Opening the cans was no problems with the screwdriver to punch a hole and the needle-noses to tear the lid from the can. The chips and dips didn't require any utensils.

All in all, it's better to have the right tools, but someday you may be as unprepared as I usually am, so it's good to know you can depend on your Kleins (if you're lucky enough to have some), whatever the job. ■

Editor's Note: Bill has absolutely no connection with the Klein Tool Company, except that he keeps them in business by buying their tools. Bill also has very little connection with Pop'Comm, *and that connection is becoming more tenuous as the months go by.*

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