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POPULAR COMMUNICATIONS

SEPTEMBER 2002

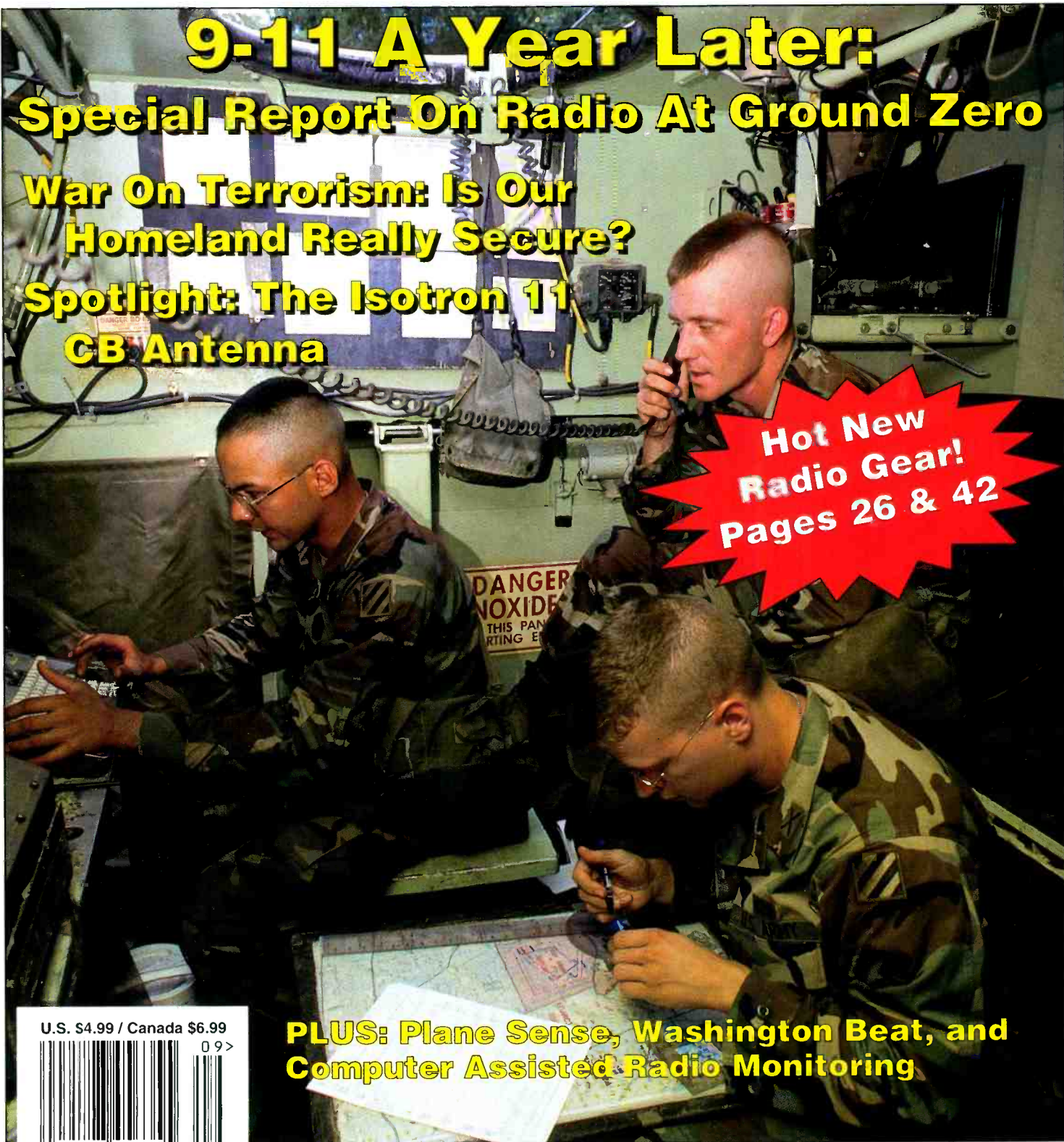
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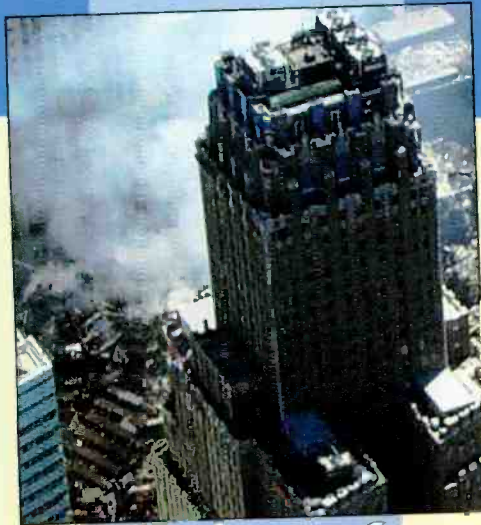
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On The Cover

Preparing for the worst case scenario, these soldiers from Ft. Stewart, GA practice coordinating live fire at the Artillery Fire Control Center. Similarly, our Nation's radio operators put their skills to work on that fateful September day last year. Read Bart Lee's exclusive report from Ground Zero on page 6. (Photo by Larry Mulvehill.)

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A Year Later

Through the web of time we emerge a short calendar year distant from the events of September 11, 2001. That precise moment in time is certainly different for each one of us. Where were you when the first plane struck the World Trade Center or the Pentagon, or crashed in Pennsylvania? When the Towers collapsed? That precise moment in time—whether it's the image of the planes, the raising of the flag, our mourning the loss of a loved one, watching a neighbor who seconds later might have not come home that evening, or hearing the gleeful cheers of the children at the end of the block yell, "Daddy, daddy, daddy!" as time revealed another neighbor who made it home alive that day.

My friend, Eddie Muro, K2EPM, on Long Island, New York, reported that evening shortly after 8:30 p.m., "I went to the local park at sunset that usually has an awesome view of the World Trade Center, but there was nothing but a dust cloud...there is an eerie quiet in the skies around JFK airport. The only sounds of planes were of those fighter jets patrolling NYC, and in all my years living in NYC I never saw a military jet operating. In fact, as I typed this I stopped to run out and look in the night sky as the sounds were deafening."

For me personally, it was the dead quiet and the fact that Vice President Cheney was holed up in a bunker somewhere. Having grown up during the Cold War, the event provided a stark reminder that the unthinkable might be next.

Strange, isn't it, that here in the 21st Century human beings, because of the barbaric actions of certain other human beings, must still be concerned about making it home alive after a day at work? I can't help wondering sometimes just how far we've come in 50,000 years. Forget about the U.S. always trying to understand other cultures and ways of life. Forget about what the U.S. and our allies have or have not done—right or wrong—over the decades. The fact is, we'll never please everyone all of the time and there will always be someone or a group of Neanderthals wanting to bring us down. Fact is, though, by the very

design of our democratic system and strong will of our people, it will never happen, regardless of how horrific their weapons of mass destruction.

We'll never rid the dark corners of all the cockroaches, but if we rethink our military and intelligence-gathering strategy and get our collective act together when it comes to interagency cooperation and sharing of information, we'll at least show a common face to the enemy and be able to act in real time to prevent future attacks.

And, while we're talking about remaining steadfast, let's hope we have the smarts to differentiate between a moderate amount of well-placed patriotism and common sense, not allowing old-fashioned patriotism to evolve into something that sets us back 50 years.

My concern isn't just future acts of terrorism, but what our government typically does when confronted with a crisis: They create more bureaucracy. In this case, a new agency, essentially what amounts to a shuffling of the chairs and redrawing of the organizational charts. In many respects, we're still doing the old Laurel and Hardy routine. It's not even funny anymore. There's more than enough bureaucracy—federal, state, and local—to figure out what happened on 9/11. Our leaders should begin using the many tools they have at their disposal today, and get it right the first time. There were colossal failures leading up to 9-11, and those charged with heading them off at the pass failed us, plain and simple. There is a gigantic job with daunting responsibility, but fact is, that's what they've signed on to do: protect America and our interests, not line their pockets, ignore their constituents, and tap dance their way around the issues that cost lives.

Let's face it, had this tragedy happened on Bill Clinton's watch the politicians would have called for more resignations than the Army has Hummers. And, in all fairness, there were many glaring blunders during those years from inadequate, inappropriate response to terrorist bombings to a general failure to recog-

(Continued on page 78)

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9-11 Amateur Radio In New York

A Private Citizen's Eyewitness Report On Ham Radio's Finest Hour

by Bart Lee, KV6LEE, xWPE2DLT <blee@slksf.com>

Editor's Note: This is not sponsored or authorized by the American Red Cross; it is a private report on Amateur Radio. It was written in the days following the 9-11 disaster.

"In a time of crisis, you do not 'rise to the occasion'; you sink to your level of training."

—Attributed to Mr. Art Botterell (www.incident.com)

Amateur radio went on the air in an Emergency Net minutes after the terrorist attack on the World Trade Center. Guy Richman, KC2AYG, net control, had the Amateur Radio Emergency Service (ARES) net working in disaster relief shortly after 9 a.m. Now, months later, I take pride in how amateur radio volunteers put their training and skills to work, subjected themselves to unknown risks of further terrorism, as well as spewing toxic smoke, and made ham radio effective when all else had been destroyed. We took the terrorists' best punch, but the New York Fire Department and other public safety people fought back, sacrificing more than 300 more souls in the struggle to save thousands of lives. An important aspect of our response was amateur radio in disaster relief. I was there.

As FEMA federalized ARES, the New York Radio Amateur Civil Emergency Service (RACES) net coordinated disaster relief communications as soon as 9:30 a.m. On 2 meters, 147.000 MHz soon served as the net's main frequency, 24/7, for many days and nights. Guy put in long days at the mic and Mark Phillips, KC2ENI (G7LTT in the U.K.), took the net at night. Guy and Mark were the "Ironmen" of the first week. In the wartime condition of New York on September 11 and the week following, the 18 hour-a-day devotion of men like these—and there were many—at Red Cross Radio and elsewhere made all the difference. This was no drill. In fact, the RACES Manhattan station itself, along with the City's Office of Emergency Management Center (OEMC), was lost with the 9 a.m. evacuation of World Trade Center Building Seven, and gone forever with the collapse of that building at 5:23 p.m.

Both Guy and Mark worked from their home stations in the Bronx and in Brooklyn during the entire operation. All disaster training warns against the "Ironman Syndrome" because of the risk of error and burnout. Yet in the first days of this new

At 17:23 hours, 9/11, World Trade Center Seven (WTC7) collapsed, taking with it the Emergency Operations Center and the RACES communications center, which had to be abandoned at 0900 hours. The two photos show WTC7 behind the "head-and-shoulders" building at 17:22 and gone at 17:24. Shortly afterwards, church bells in lower Manhattan rang out "Amazing Grace." It was unbearably sad. (Photos by Bart Lee, KV6LEE)



war, many responsible and trained radiomen pushed their limits every day.

Something Big Is Up

On the morning of September 11, I sat on a bench with a cup of coffee on a gorgeous day in upper Manhattan at Lexington Avenue and 86th Street at about 9:00 a.m. Then I watched several ambulances, fire engines, and fire trucks stream past me. "Something big is up" I thought, based on what would be more than "a full-box response" in my home town of San Francisco. My New York host soon joined me. At about 9:35 a.m. his wife got through on his cell phone: "The World Trade Center is attacked!" What to do?

He got his son at a nearby school and I got out my Yaesu FT50R handheld transceiver and turned to VHF, with the car radio tuned to WINS, New York's all-news station. All the news was inconceivably bad. The first voice I can recall hearing on the ham bands was the distinctive Bronx accent of Guy. I knew that New York's response to this enormity had begun.

As we drove south past mid-Manhattan, thousands of people walked north, some grim-faced, some looking normal, some in tears, all determined to move away from the site of what no one could understand. At my hosts' apartment at the end of Fifth Avenue, the smoke and dust was so thick that we could not see south past Washington Square Park. Once upstairs, maybe 10:45 a.m., we saw the video of the planes hitting and then the Towers coming down: "World War III," I thought.

D-day VHF ham traffic that I heard that morning related to hospital utilization and out-of-state DMAT (disaster medical assistance teams). The Fire Department coordinated on 154.37 MHz, a frequency I learned about from monitoring the ham nets. Staging in Brooklyn, they intended to come across the Brooklyn Bridge, walking if need be. The First Responders had already been lost with the collapse of World Trade One and Two. On 154.29 MHz, I heard that the Rescue Teams were trapped in the ruins. The NYPD was up on 151.47 MHz. The Red Cross came up on 146.90 MHz. Hams in emergency communications came up on 146.62. I scanned through the various VHF bands manually. I never heard the whole story, but I did hear the fragments that made up the mosaic of the initial disaster response. Every voice was professional and courteous, determined to do the work of recovery, and all were unified in the face of the horrific toll of terrorism on the city.

An E-mail And Monitoring

At my hosts' lower Manhattan apartment, friends from the hot zone below Canal Street began to show up to take refuge. They had heard the jets, had seen the burning buildings, and saw them come down. Staggered and traumatized, they told us



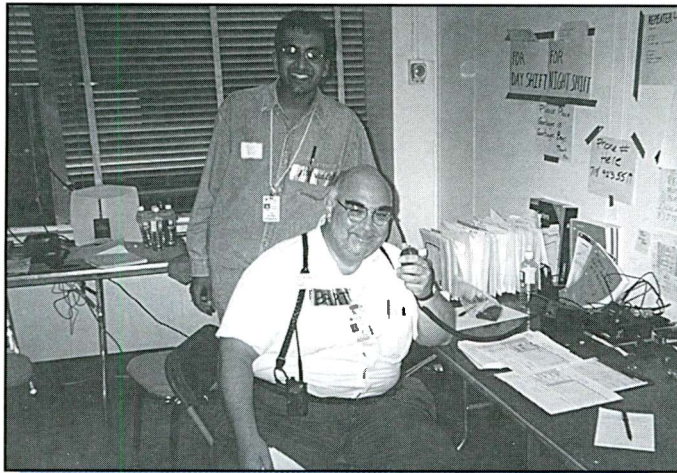
World Trade Center, D-Day + 3. With thousands dead, the World Trade Center lies in ruins. WTC7, with its Emergency Operations Center, is at bottom left. (Civil Air Patrol photo)

their stories. At 11:30 a.m. I sent the following E-mail to fellow amateur radio operators in San Francisco emergency services (one of the few E-mails of mine that got through):

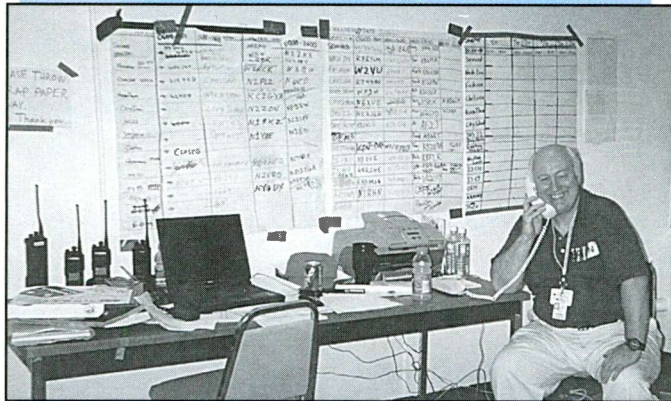
SFARC, MOES/ACS/RACES Sept 11, 2001 [about] Noon. I am in lower Manhattan near Ground Zero. We could not see past the end of Fifth Avenue for the smoke from the collapsed World Trade Center. Enormous amounts of cement dust. NYFD and NYPD mobilizing on VHF. Cell phones mostly don't work. Hams up for emergency communications on 2 meters, with Red Cross etc. My host is a doctor and we are likely going to a hospital. This is real life triage, an inconceivable tragedy, and there will be much to do. Thank God for what training I have. Be well and be careful, 73 de Bart Lee KV6LEE.

Most landline phones were not working because of overload and destruction of facilities. I did hear a working number for the Red Cross on the ham net. At noon, I went up on the roof to monitor and to take pictures. At 2:40 p.m. I heard the New York City Police Department (monitored on 154.81 MHz) call for refrigerator trucks, or "reefers," for morgue operations.

From the roof, a mile and a half north of Ground Zero, I saw the third building come down, World Trade Center Building



Red Cross Radioroom at Brooklyn headquarters in a quiet moment at 4:00 a.m. on September 18. Bart Lee, KV6LEE, is at the mic, Bob Suresh, VU2COT, is assisting. (Photo by Bobby Rios)



Red Cross Radioroom administrative wall with large charts for assigning operators to posts. Brian Fernandez, K1BRF, is shown in a lighter moment at the phone on September 18. Note the 800-MHz radios at the left, the laptop used by Charley Hargrove, N2NOV, and others for scheduling, and a fax machine printer. (Photo by Bob Suresh, VU2COT)

7. It had held the OEMC and the Emergency Operations Center (EOC), as well as the elaborate RACES ham radio station. At about 5:22 p.m., it was there with lots of black smoke behind it; at 5:24 p.m., it was not, replaced by blue sky, just as the Towers had been. My perception was that it took less than a second for the building to fall—too quick to get the camera up. It buckled about a quarter of the way up, slid over a little to the right (west), and fell mostly straight down. "A sad lesson," I thought, "do not put the EOC and radio stations in a target building, no matter how well guarded it may be." The smoke may have come from the many thousands of gallons of emergency diesel fuel stored at the site for the emergency generators for the EOC. The building became a giant candle wick until the steel buckled from the heat.

The next morning I walked well into the hot zone south of Canal Street to accompany a resident retrieving her belongings from her apartment on Worth Street. It was deserted and as eerie as a Twilight Zone episode. Then I volunteered at the Red Cross uptown. The communications chief, Jay Ferron, N4GAA, put me to work with Charles Hargrove, N2NOV, the

ARRL District Emergency Coordinator, and John Kiernan, KE2UN, for the Red Cross.

Managing The Volunteer Pool

Jay did a magnificent job getting amateur radio communications into each of a dozen Red Cross shelters and three OEMC sites for 24 hours-a-day for nearly two straight weeks. Charley carried a heavy load in the first days, as did John. Charley initiated much of the organizational work that I was privileged to carry through. Hams volunteered from all over the metropolitan area and several states. (I happened to be visiting from California, as was Don Jennings, K6QDT, who cured our transmitter problem the second night). Westchester RACES supplied many trained and capable radio operators day in and day out, as did New Jersey.

Such effective management of the volunteer operators pool is a tribute to the skill and dedication of the nearby ham radio organizations—they made it work. The ARRL's Tom Carrubba, KA2D, a Section Emergency Coordinator, did outstanding work.

D-Day + 1—High Tech Breaks Down

September 12, the Red Cross ran its radio operation from a corner of the bottom floor of its headquarters building at Amsterdam Avenue and 67th Street. John had brought in his Alinco mobile rig and a power supply. Some mag-mount antennas got the signal out through a metalized window to a repeater some blocks south. This was full field expedient, just like all of the rest of the radio operation I saw—and it worked, although not without some hiccups. But time after time, what we needed was manuals to figure out how to fix each problem that inevitably arose.

The reason it all worked, and worked better and better each day, was that everyone involved made it better and better every hour they put in, in hundreds of accumulating little ways. From putting up signs to offering themselves for a "hot wash" debrief despite their exhaustion, to putting in 16-hour shifts, the hams made it all work for everyone.

As many as 100 or more hams each day involved themselves on either the day or the night shift, nominally 12 hours each. (I was night shift trick-chief for the first week and had the privilege of working with almost all of the volunteers, as did John on the day shift for the first week). We knew many of our best radio ops simply by first name and callsign, such as Kevin Stickelman, KC2CPF. We used duct tape and magic marker as name badges, front and back. We explained that we wanted to be able to read and call out their names through 25 feet of smoke and dust if we had to.

Amateur radio operators worked in "the hot zone," at OEM sites, and at many shelters at unknown but real personal risk. All put in long days and nights, ensuring that traffic got through. In the first several days, cellphones and landlines either simply did not work, or were spotty at best. Vaunted high technology fell to earth, but hundreds of hams from all over with their own radios and equipment stepped in for effective emergency communications.

Some of the earliest traffic I was personally involved with at the Red Cross headquarters was an emergency evacuation order for a shelter near the Empire State Building, which had received a credible bomb threat. This order went out on a handheld transceiver into a jury rigged Yagi antenna (the old Alinco



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Communications Suggestions For OES

September 2001 per KV6LEE Based On WTC 9/11

- Plan on losing the command center: have a back-up location in place and operating; expect to lose both landline and cellphone service for several days.
- AVOID THE TWO BIGGEST BOTTLENECKS: 1) CREDENTIALS; AND 2) TRANSPORTATION TO GET INTO THE SECURED GEOGRAPHICAL AREA. Use pre-existing badge-like emblems for persons and vehicles.
- Use Incident Command System at OES and at each other site; have a commander, a safety officer, public information officer, liaison, a logistics person, an operations chief, a planning and intelligence desk, etc., and manage access to each site.
- Duct-tape ID works and builds moral.
- Disperse "capital goods," such as working radio systems and maintain them.
- Obtain and disperse manuals and cheat-sheets for radios.
- Anticipate and use emergency volunteers (Red Cross calls them Local Disaster Volunteers).
- Work out client relationships in advance with radio organizations and anticipate types of messages.
- Alert volunteers in advance as to what equipment is

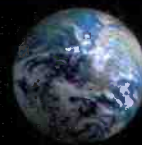
required: mobile two-band transceiver, power supply and battery, gain antenna, and all the fixings.

- Be prepared to orient volunteers to disaster work (see memo).
- Cache and stock on site everything needed for effective operation, e.g., message pads, log books, minor medicines, water for three days, dust masks, "shelter kits" for personal hygiene, etc. but...
- Beware of unreliable computers and high-tech systems.
- Plan on many days, so have a night-shift ready to go from day one.
- Have preset bandplans for radios, refer to tactical identifiers for sites and frequencies.
- Expect jamming unless jammers are eliminated in advance; ignore jamming.
- Have at least one repeater or input-frequency monitor without a PL filter. Ensure repeater coverage and backup repeaters for both 2 meters and for 70 centimeters. (Maybe two for 2 meters and two for 70 centimeters).
- Organize priority frequencies in advance.
- Establish a high-frequency station (e.g., W6PW) linked to systems for out-of-area traffic.

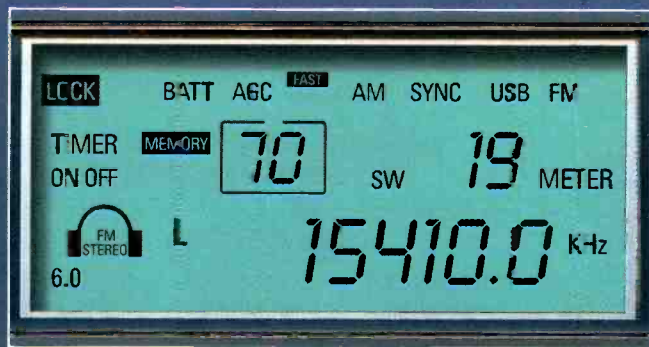
was down for repair). There was all too much of that priority in the early days of this horrific event. At one point during the September 12-13 night shift, all Red Cross operations were halted via ham radio, awaiting assurances of security from FEMA. We lived the "fog of war."

RACES capability was lost with the attack, but the readiness of the RACES and other ham operators restored that capability starting on day one. Each had his or her own equipment and knew how to use it and how to work with others in an effective, if ad hoc, disaster communications team.

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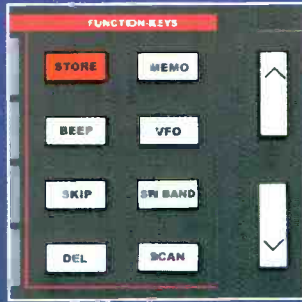
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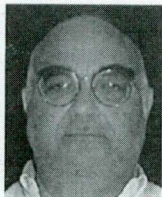
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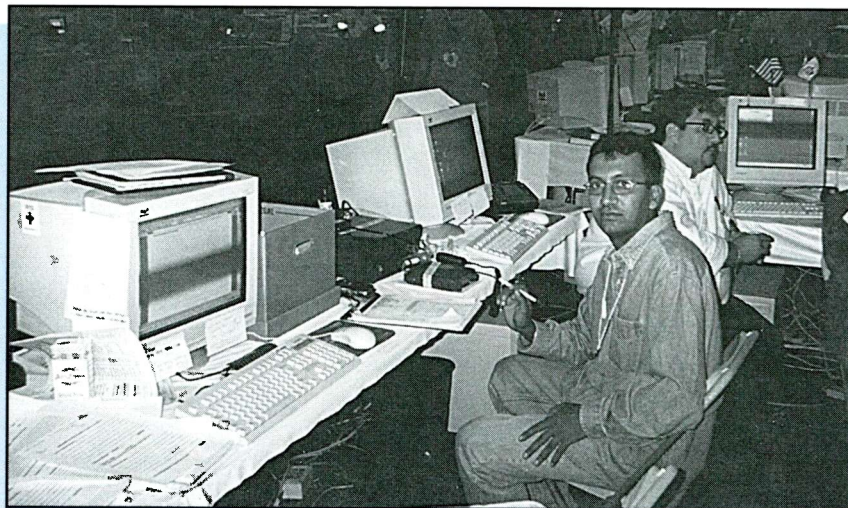


**Bart
Lee**

EXPIRES: ..

**12/30/01
Full Access NO
Ground Zero**

*Official Red Cross ID as required after
September 14 by FEMA.*



The Red Cross Radio post at OEM-1, the Emergency Operation Center established at Pier 92, with Bob Suresh, VU2COT, on duty (his photo). The computers are running E-Team emergency management software. At Pier 92, one Red Cross ham operator manned this post and two roamed with handheld transceivers on simplex to relay messages to and from various agencies sited on the pier.

We never had too few volunteers, all of whom had trained themselves to do whatever it takes, and they did it. They came with a mobile rig, a power supply, and a gain antenna, as requested. We had hams from several countries helping as well. Those from England, Russia, India, France, Canada, and the Leeward Islands stand out in my mind. Things like nationality or ethnicity were less than irrelevant because, in that moment, we were all New Yorkers at war, and in our case, serving the Red Cross. Some technically adept not-yet hams, Bobby Rios in particular, also supported our early response.

For hams going to the hot zone, we issued dust masks and special credentials, and each shift of operators got a disaster-worker orientation (initially from me) and later a debriefing. These hot wash debriefs helped us pinpoint the problems to resolve for the next shift. Often a new shift, hearing a debrief, simply figured out how to solve a problem and did it.

The Red Cross transported the radio ops into and out of Manhattan from Brooklyn after transferring New York operations there on D-Day + 3. The Red Cross soon coordinated its transportation on its own 800-MHz replacement repeater system, but the hams stayed in communication especially to ensure that a radio operator whose shift had ended got back to base. We had to take care of our own in that regard, because of the volunteer drivers' unfamiliarity with the emergency radio operation. Jay and I and few others also worked the 800-MHz radios for internal coordination. Like most New York commercial repeaters, the Red Cross 800-MHz system went down with the Twin Towers, and it was almost a week before they had reliable 800-MHz communications. One odd aspect of the situation was the total absence of intermodulation distortion (intermod). Most of the antennas for the pagers and most repeaters fell with the Towers. On VHF it was like 1963: no interference.

Red Cross National Headquarters sent up a new communications van with John Perry, N1EOD, which was very useful during the move of disaster operations from Manhattan to Brooklyn. The van permitted us to take routine traffic during

the transition, with Brooklyn not yet up on the air and Manhattan packing up to move.

Brooklyn Headquarters

Brooklyn Headquarters was a "bare-base" operation: there was only a building when we got there. Radio was one of the first functions in, up by September 14 at 5:00 p.m. This complicated coordination, with two bottlenecks in the operation: getting appropriate credentials for the ops in a timely manner (and "appropriate" got stricter daily) and providing transportation. The challenge was to make sure that no ham was left behind at a shelter or other site at the end of what was often a very long 12-hour shift as well as to get relief operators in on time.

Doing both radio installation and credentials in Brooklyn, David Craig and Tyler Schetler (both hams) were heroic. Radio room operation in Brooklyn, certainly on my night shift, put in place some Incident Command System principles. We got organized, put up signs, isolated command from intake and the ready-room, separated operations from logistics and safety, collected the log, etc. San Francisco's Emergency Response Team drills paid off in New York. Brian R. Fernandez, K1BRF (my replacement, and a great help throughout), and I had both trained with San Francisco's Auxiliary Communications System of the Office of Emergency Services (OES). Our San Francisco earthquake communications drills came in handy in New York.

We also did many simple things, like put out a lot of garbage. Just keeping the scrap paper and water bottles from cluttering the operation was a task. Getting organized from scratch involved not just getting radios up, working and maintained, but also file creation and management, setting up the radio log, using the laptop to manage volunteers (Charley Hargrove did this), assigning shifts twice a day, creating large daily shift charts to keep track of operators and shelters, and managing sensitive credentials.

Everyone worked with courtesy and goodwill, but stress can take its toll. "Stress makes you stupid" is another truth attributed to disaster specialist Art Botterell. San Francisco disaster man-

Practice Helps!

There's a rule in public safety about emergency and disaster operations: You do in a disaster what you do every other day.

I've been in enough emergencies and disasters to vouch for this rule. During a disaster, you don't have time to pull out the disaster plan. You don't even have time to sit back and try to remember what the disaster plan is supposed to be. You simply do whatever you do every day, only a lot quicker and with fewer rest breaks.

I believe this applies to amateur radio as well. If you don't use proper radio procedure when you're talking on the repeater, you're not likely to use it when you're in an emergency response. If you don't handle radiograms now and then, you'll have trouble doing it when "The Big One" hits. If you're not used to running (or even checking into) a directed net, you're much more likely to cause disruptions to a directed net during an emergency. If you want to be ready for emergencies:

1. Always use good radio procedure, even during drive-home QSOs on the local repeater.
2. Hop onto a traffic net now and then and handle some traffic. This means sending traffic now and again. The traffic pads from the ARRL are helpful, but they're even better if you've had practice using them!
3. Check into nets, both informal and directed. Act as Net Control Station on a directed net when you get the chance (but let others have a shot, too!).
4. Help out with the non-emergency amateur radio events. Pittsburgh EMS regularly uses the Pittsburgh Marathon as "practice" for a disaster, and I believe that the amateur radio operators who work that (and other events) are much better prepared for a disaster as well.
5. Field Day and contests can be used as a way to "shake down" your system. I hilltop during a lot of VHF contests so that my equipment will work if I have to "hilltop" during a disaster.

—Rob Carr, N3RTR (via Bernie Walp, WB6PIO), with permission.

agement specialist and USAR veteran Ron Lopez (also a ham) faxed me the Critical Incident Stress Management Protocols, which helped Brian and me to recognize and lessen stress reactions in ourselves and others. Sleep works wonders.

Keeping Track Of Everyone

The dozen or so shelters in Manhattan (and also one in both Staten Island and Brooklyn) kept track of their clients, staff, security, etc. Red Cross polled them regularly by radio for these numbers, in a sub-net to RACES. There were, at first, no operable, reliable telephones or fax lines. Once telephones worked, that traffic came off the RACES net. Throughout the shelters, ham radio took whatever shelter traffic was necessary. In the early days, radio was the only link between shelter managers and mass care or logistics at headquarters.

The Red Cross sent Multi-Disciplinary Outreach Teams (MDOT) into lower Manhattan around D-Day + 8. They tried to communicate with cellphones and handheld E-mail, but only amateur radio worked reliably, at least at first. Jay had insisted on a ham radio operator on each team, and it paid off. Even donated dedicated Nextel phones and Blackberry

wireless E-mail terminals did not provide the effective communications hoped for because of overload on the networks. Trained ham radio operators working in the directed RACES net made the DMOT communications possible for the Red Cross.

What is truly great advanced communications technology in normal times did not match man-managed "legacy" radio messages in a time of crisis. All those photos of people walking with cellphones to their ears on September 11 show people listening to busy signals. Even if the network is not blocked with traffic, a very busy person still has to answer the phone, and probably already has, thereby tying up the line. Radio messages got through because many people made sure each one got through.

Ham radio had a client relationship with the Red Cross. The RACES net served the Red Cross as its client, while always available for other functions. One was our notice of need for hams in White Plains on D-Day + 1, although we did not mention over the air that the alarms at the nuclear plant were sounding. This was a new war and we had no way to know what was next.

The hams in the Red Cross shelters served the shelter managers as their



Red Cross Radio supervisor Jay Ferron, N4GAA, assesses hot zone amateur radio communications requirements. He organized the entire amateur radio response for the Red Cross. (ARRL photo, with permission)

clients. Once Charley Hargrove got ARRL message forms off the Internet, we used them as much as possible so we could pass traffic that was concise and unambiguous. The Internet worked just fine, as it was designed to do in disasters, but connecting to the Internet was too often almost impossible for the first few days because of the loss of telephone line capability and blocking traffic.

In the wee hours I had the privilege of taking the RACES net for a few minutes at a time as required. Radio also helped to deal with at least two "rogue" or "bandit" operations of unauthorized assistance (if it was) while I had the mic for the Red Cross. Red Cross management several times expressed its appreciation to radio operators for helping to resolve this sort of problem, and for quickly assessing shelter resources as big needs developed. For example, a sudden need for many cots arose as a shift of firemen came into a respite station. (The hot zone respite station was Intermediate School 89 on Canal Street, tactical call OEM-2.) I was polling the shelters for their client numbers when we got the word. I went back to each shelter to find out the available cots from each, and quickly passed this information on to Logistics so they could be picked up and brought to the respite station. Management thanked us in writing for our quick response. This kind of appreciation maintained the high morale of Jay's 24/7 amateur radio operation.

Amazingly, Some Jamming

There was also, amazingly, some jamming, although it did not effectively

interfere with operations. We ignored jamming, but the lesson here is to find the jammers now with direction finding and transmitter printing, and put them out of business before they interfere with disaster recovery.

Typical Comms

A typical early message was:

#4 URGENT Origin: N2XKA Place: Westchester Time: 00:14 Date: 9/14

To Mass Care [NY HQ]: Received at KV6LEE [op at NY HQ Radio]

WESTCHESTER HAS A TRACTOR TRAILER WITH 27 PALLETS OF SOFT DRINKS AND SNACKS NEEDS DIRECTIONS FOR DELIVERY IN NEW YORK CITY—RESPONSE REQUIRED

Such a message was hand carried through the building to Mass Care, and a written response put down on the message. This was then carried back to the radio and the response was sent out by the operator.

A typical later message was:

R[outine] Origin: OEM-2 Place: IS-89 Time: 02:22 Date: 9/18
To Mass Care [NY HQ]: Received at KV6LEE [op at Brooklyn Radio]

IS-89 REQUESTS 50 BREAKFASTS FOR AGENCIES' PEOPLE ON SITE

We used tactical calls such as "OEM-2" without disclosing OEM locations. All feared further terrorist attacks, so a wartime security consciousness arose. IS-89, the school used as a comfort station for disaster workers (at one point, the one count was 2,000-plus!) was not identified on the air except by its tactical call. The shelter identities (schools mostly) were used over the air because they were publicly announced and the Red Cross wanted people to know where they were. We identified our frequencies only as Tac 1 through Tac 12. The press was known to monitor the net, and may even have come up on frequency as the "bandit" that asked for sensitive location information over the air in the middle of the night. That incident prompted me to alert OEM to the issue.

One of the ops, Robert Gissing, VE3ZLV, and I put together a memo for new ops, based on my orientations for the first several days. A much edited text follows:

Red Cross Radio WTC
Operations Procedures Guidelines
To Radio Operators, From Staff (KV6LEE)
Version History 2.0; version date 18 Sept. 2001 4:00 AM

Introduction: In responding to disasters there is much general information that can be useful...this document is meant to help the volunteer understand disaster relief work, the radio network, operating procedures, rules of operation [etc.].

THE FIRST RULE OF DISASTER WORK IS TO NOT BECOME A VICTIM OR [OTHERWISE] MAKE THINGS WORSE INSTEAD OF BETTER.

In all things, remember your role within this operation. You are a communicator of information. Do not try to solve problems you are not qualified or empowered to solve. Be careful, DRINK LOTS OF WATER, i.e., stay hydrated, and get your

rest. The security on the site is very strict and there is no tolerance for anything less than total commitment.

[Excerpts from Procedure, Rules and Order of the Day:] The helmet is your friend. The [news] camera is your enemy.... Be clear, concise and unambiguous. Use standard phonetics and "niner." Remember: Who, what, where, when why and how. The Net Controller is always in control of the NET. Do what he says....Communicate with your shift manager when you are off shift and arrange for your next shift. Go home and sleep: "When you leave the firehouse, leave the firehouse at the firehouse."

RED CROSS THANKS YOU FOR YOUR HELP
NEW YORK THANKS YOU FOR YOUR HELP

The work was exhausting. After nine days, I turned my job over to my replacement, Brian, K1BRF. At 17:52 on September 19, Brian had taken this traffic from W2ML:

About 10 minutes ago on the New Jersey Turnpike a New Jersey State Trooper pulled over a ham, showed him a 2-Meter H/T and asked him to relay to the Net that they had been doing a great job and congratulations to all. The Trooper said it was "ham radio's finest hour." [Per K1BRF at 18:30]

I heard no "health and welfare" traffic on the ham bands, but I was directly involved with Red Cross while in New York and not otherwise monitoring. We did poll the shelters on request looking for missing people, and that was very sad traffic to handle. My impression is that tactical skills really came to the fore. Traditional amateur radio traffic handling did not come into play in my experience. The ability to pass tactical and client traffic in a VHF-directed net was the skill that mattered. It was no easy task just to get that traffic through reliably. Trying to do anything else but just pass the tactical traffic would be distracting and counterproductive, at least in the nets we worked.

The Salvation Army also offered disaster relief and provided respite and resources for rescuers. I saw how grateful the rescuers were to the Red Cross and the Salvation Army for their help in the hot zone. The Salvation Army SATERN net coordinated its activities also using amateur radio. REACT was also involved on GMRS frequencies in support of the Salvation Army.

Ten Days Later

On September 21, D-Day + 10 in the hot zone, I identified myself as associated with the San Francisco OES and then walked to Ground Zero, the burning rubble. It was as surreal and shocking to be up close as it had been to see it all happen on D-Day. I came home to California stunned by the terrorism, but proud of all of the Americans, and all of the New Yorkers I saw and worked with in New York City, especially the hams. Back in San Francisco, I wrote up some suggestions for OES radio in this new world and pulled together some cogent comments of others, which follow.

As the poet A. E. Houseman has written:

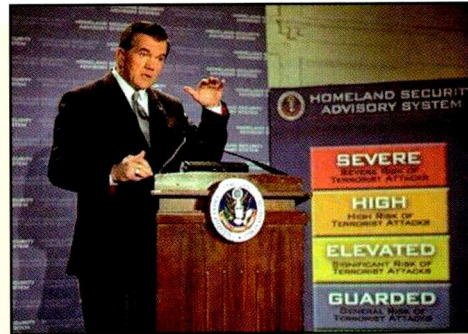
*Therefore, since the world is still
Much good, but much less good than ill,
And while the sun and moon endure
Luck's a chance, but trouble's sure,
I'd face it as a wise man would,
and train for ill and not for good.*

—From "A Shropshire Lad," by A. E. Houseman

The Absolute No-Holds-Barred Truth About Digital



President George W. Bush visits the New York City Command and Control Center. (White House Photo by Eric Draper)



Director of Homeland Security Tom Ridge presents the Homeland Security Advisory System to the media. (White House Photo by Paul Morse)

Given the current U.S. War on Terrorism and the president's Homeland Defense Initiatives, security of the nation's communications systems infrastructure, as well as security of our electronic communications themselves, become preeminent. So many public safety officials, military agencies, and political leaders have been pressing for "updated" and "upgraded" radio systems for both government and critical private sector interests.

Many such proposals call for greater "interoperability" among these radio services and users. Proponents want these collective groups to be able to cross-communicate with any other stations or agencies within this collective, massive group. At the same time, some of these proponents simply want to add more radio channels, either in terms of new or expanded bands, or "spectrum efficient" technologies, such as trunking and digital multiplexing.

We really need to take a good look at the newer digital radio air-interface modes, particularly as to how digital transmission and its cousin, digital encryption, may play a part in "secure" wireless communications. This is especially important to particular individuals among us: Some Pop'Comm readers may be government or private wireless system/network administrators involved in procurement and budgeting. Others may be public safety or private sector radio system users. And this information is equally important to volunteers active in public safety, disaster response, communications support, and any other function that would be considered vital or critical in time of emergency. Recent *Pop'Comm* reader surveys indicate that a whole lot of you appear to belong to this group, to one degree or another.

There are a number of urban legends perpetuated by digital radio equipment manufacturers and vendors. What we really need to know, more than what digital radio *can* do, is what digital radio *cannot* do! Similarly, we need to know just what purportedly new "digital" voice system ancillary capabilities have become available. Many of these are digital features that "analog" systems have already had available for many years.

Finally, we need to realize that most digital radio vendors don't want potential users to be aware of a number of these facts.

Resisting The Temptation

Many people in the constantly changing world of high-tech wireless communications seem unable to resist describing a change-out to digital voice radio, as opposed to having any sort of "analog" system, as an "upgrade". I just cannot speak in those terms. AM, FM, sideband modes, FDMA, TDMA, P-25, TETRA, spread spectrum modes, and various proprietary transmission modes all have their advantages and disadvantages. To say that "digital" technology is *generally* an upgrade over "analog" technology, is *patently false*.

Understanding Digital And Encrypted Trunked Radio Systems Evolution

Let's look at some basic concepts and perceptions—as well as misperceptions—of digital voice trunked radio systems. I am presenting here a loosely knit list of concerns and misunderstandings that I know are on the minds of a great many digital systems users, system operators, and administrators considering switching to digital wireless operations. Likewise, I am including **facts and observations** to crush urban myths and to give folks a clearer vision of what we may be facing in the Lost New World of digital radio communications systems.

For trunk networking, there is much interest in using the Internet as a network backbone, rather than traditional, expensive, landline or microwave backhaul facilities. Trunked, cellular-architecture, and linked-repeater radio systems have some major features that both wireless system administrators and users need to consider. You see, all such systems need a "backhaul" network with which to pass both signaling and communications traffic among the various base station sites and nodes within each system. The network carrying backhaul messages

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is often called the "backbone" of the entire radio network in question. Various versions and flavors of one of the newest applied wireless technologies, the Voice-Over-Internet-Protocol, or VOIP protocols, are rapidly coming into production.

These systems rely on *packetized*-type digital speech switching and inter-site transport. This is fine for wireless network switching and backhaul, if it is done over dedicated servers, landlines, or microwave networks. Some proponents would insist, however, that using the Internet for backhaul makes for a high-speed network. But, high-speed-on the Internet? Internet servers are notoriously slow. Painfully slow!

Users of an Internet backbone may find themselves with serious latency issues here. What I mean by "latency" is the time lag between the moment one user presses the PTT switch and speaks and the time at which that message is received and heard at the receiving station or stations. And when Internet servers along the way fail to meet an operator's service expectation, who is the operator going to call? If a particular radio system administrator is using dedicated or leased lines from a carrier such as MCI or AT&T for example, then they know who to call if circuits become slow or noisy. But on the Internet, at server nodes far removed from a sysop's originating Internet service provider, who are they going to call when backhaul service grinds to a halt? In using the Internet for backhaul, network administrators have no control over the network backbone. Not good.

Some VOIP system manufacturers and vendors assert that an Internet backbone provides for low-cost "secure" conversations and "seamless" network coverage to a large degree. I don't know whether to laugh or cry whenever I hear this sort of marketing hype. Secure and seamless comms on the Internet? How secure can this system be considering the Internet's regular network failures of various types, including server overloads and crashes? Having vital or time-valued traffic lost, delayed, or undeliverable due to Internet-related problems is not most folks' idea of a secure connection. Nor does the Internet's inherent unreliability contribute to an image of a "seamless" system when the seams keep coming unraveled. Among other considerations, **secure** means having a reliable, dependable end-to-end connection. I would not advise using an Internet backbone/back-

haul network for mission-critical or life-safety wireless applications, such as public safety or disaster relief.

Oh, and what about Internet backhaul being low-cost? No doubt it is. Remember, though: you get what you pay for. As a trunked radio system user then, would you rather rely on owned facilities or dedicated leased lines; or would you prefer to have your radio traffic lost in the World Wide "IP" shuffle, replete with gaggles of hackers and offshore media drives sucking up and storing every "bit" that passes by? You tell me.

Geographic Information Systems (GIS) are offered on some digital radio systems. GPS satellite location technology is thought to be foolproof when it comes to pinpointing the location of any and all of a system's mobile radio and handset users. Some digital handheld portables are available with built-in GPS receivers. However, system operators have a very serious consideration here. GPS is of very limited value in portables. Why? Simple: GPS does **not** work indoors! It doesn't work in heavily wooded areas, nor in narrow urban concrete canyons where high-rise buildings block out all but a sliver of sky. GPS doesn't work in tunnels or on lower decks of stacked freeways and bridges.

Does anyone think that merely knowing the last reported position of a portable will suffice? How valuable is it in a large building (vertically or horizontally) or on an academic or corporate campus, particularly in situations where buildings are connected by tunnels or covered bridges? How about on a subway system? On an airplane? What happens when a user powers off his or her handheld radio indoors, then powers it back on hours later, elsewhere indoors, possibly on the other side of town? Think about it.

A number of trunked radio vendors claim that throughout the 140-520-MHz bands both 12.5- and 25-kHz spaced channels can be used. Well, sort of...

Actually, this is a mighty large claim for a manufacturer to make. Let us see how far this feature actually goes. There are, above all, regulatory issues to consider. Bear in mind also that we are dealing typically with trunked systems carrying digital voice and data communications, and in some instances, encrypted speech. Can any such network systems operate in the entire range of 140-520 MHz? No. The FCC has other ideas. Digitally encrypted voice radio communication is specifically

not permitted in the VHF Maritime Service (Part 80), the Personal Radio Services (Part 95), the Amateur Radio Service (Part 97), certain frequencies or operations in the DOD air bands (NTIA Redbook), and possibly in some other service subparts and at specified frequencies within this frequency range.

Both the FCC and NTIA will **most likely** require the narrower 12.5-kHz bandwidth on most future wireless products or system deployment. (I say "most likely" because the Commission loves to tinker with deadlines. The NTIA may not be so flexible for its federal government requirements.) Now consider this carefully when a vendor notes any specific limitations of the narrower 12.5-kHz bandwidth, as compared to the conventional 25-kHz bandwidth. These include a slower data rate or a lower speech vocoder sampling rate, as well as degraded audio fidelity. Which bandwidth will your radio system be required to have?

Next, we must know for which FCC and NTIA radio services any trunked or digital wireless products are actually certificated. Presumably, most digital, trunked, and/or VOIP wireless systems are certificated for Part 90 services. But

also for what other services? Has the FCC certificated any system products in question for Part 74 (Broadcast Remote, etc.) or Part 22 VHF and UHF services (MTS mobile telephone, CMRS air-to-ground telephone, commercial paging carriers, etc.)? How about the previously mentioned Part 80 and Part 95 services? And are the products APCO P-25 compliant for public safety use? These are solid questions for which radio network administrators really need solid answers, not sketchy details or vague promises by sales personnel.

Degraded Voice Quality

Some feel that the near-future changeover from 25 kHz to 12.5 kHz bandwidth and ultimately to 6.25-kHz narrow channel spacing can be accomplished in digital systems without degraded voice quality. From a technical engineering standpoint this is pure hogwash. As it is, digital radio communications audio should sound nearly as good as a CD player, as some have implied. On the other hand, and in all reality, a number of critics caution people not to expect digital communications radio's encoded

audio to sound like a compact disc. (I actually saw this notice on a digital wireless vendor's Web site.) Finally, a modicum of truth surfaces in a sea of marketing-hype sewage among vendors!

Well, surely in a digitally coded voice radio system, users can expect to hear clear, natural speech without static. We have heard this repeatedly. Did someone claim "natural" audio on digital? There is nothing "natural" in digital voice radio communications, in my professional opinion. Not even close. Nothing beats the audio fidelity of a wideband FM channel, period. What is "clear" audio? If we mean no static, that would be correct. Instead of static—that is, instead of scratchy but readable communications in weak signal areas—digital modes give us absolutely nothing. That isn't much help when the message has to get through right here, right now. System operators need to carefully consider whether it would be advisable to deploy digital voice systems for mission-critical applications.

Scanner Proof?

Are digital and encrypted systems scanner-proof? Most digital radio sys-

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tem manufacturers would love to boast so. But, honestly, exactly what is the point here? There is only **one thing** any vendor hopes to accomplish by marketing RF communications products that cannot be readily received on FCC-approved devices. Amazingly, such vendors then go on boasting of this, their very own shortcoming! The fact is that such vendors typically hope to coerce customers into buying proprietary or otherwise sole source (their own!) products, often at much higher prices than more universal off-the-shelf equipment. Therefore, most marketing-hype discussion of alleged "eavesdropping" of radio communications is merely a red herring calculated to divert proper attention from the real issue at hand: potential cost savings to radio system operators through aftermarket outsourcing of auxiliary equipment and expansion user devices.

For example, scanners, pagers, and other utility-grade receivers are useful tools for any system operator in inexpensively expanding the system. Applications often exist in which certain parties to system traffic need only to *receive* messages, such as voice pages or short text messaging. In the case of simple one-way voice messaging, system users would need only to be provided with a \$350 receiver in an FM trunked system, or a \$500 receiver for an open-architecture (APCO P-25) digital system. But, in this example, the vendors in question would instead have system operators typically purchase an original-equipment handheld transceiver for each "additional" user, at a **substantially** greater cost than purchasing an alternative product from competitive sources! And it really is amazing how many trunked or digital wireless network administrator "wannabes" totally miss this important cost consideration.

What Is Sacrificed?

The key consideration here is whether the customer really wants to sacrifice flexibility and potential cost savings for some perceived need (which may be, for many, exaggerated to the point of being paranoid-delusional) for an enhanced level of privacy. One must *first* remember that the purpose of communications is just that: communicating. Intercommunication and interoperability are not well accomplished when different digital encoding algorithms don't "speak the same language."

Why then, would a system operator opt to use digital encryption? Possibly because a few apparently unsubstantiated, but well-positioned, "reports" have said that more people than ever are "eavesdropping" on analog conversations on presumably private channels as well as on government channels. Frequency lists for these channels are readily available on the Internet as these sorts of reports remind us!

Oh-oh. Someone's been talking to a digital-encrypted system salesperson again. **Statements misconstruing "eavesdropping," the erroneous precept of "private" channels, and the myth that government radio comms are somehow sacred are baseless and untrue, calculated to induce a level of paranoia among two-way system users.** This is solely to induce sales of digital radio products, preferably equipped with encryption capability. There are no "private" channels in the Part 90 radio services. But government channels are being monitored! So, what's the problem? There's no law against that. From time to time I still hear this concern being voiced by Communist regimes around the globe. Are digital encryption vendors promoting Communism or anything else anti-American here? You've got to wonder.

Someone has said that digitally encrypted radios are inherently secure from cloning to intercept signals, or to make unauthorized transmissions for free, and without being tracked. OK, newbie wireless engineers and sysops! Pay attention. Take notes. There will be a quiz. Don't make me say this twice. **There is no such thing as a clone-proof radio.** All it takes is an unnoticed or unreported hijacking or "borrowing" of the radio in question, or someone hacking into the system's encryption-key database or paying someone off for this information. Presto, cloning made simple!

Some digital systems offer a covert listening or monitoring feature. Simply, this is a feature that lets the dispatcher or system operator listen in on various mobile or portable units, without the unit operator or anyone else nearby knowing that the unit is transmitting. It can be used for covert monitoring by personnel who may be obviously carrying a radio, but apparently not transmitting. This could be good for tracking lost or stolen units, or even a user in danger of personal harm who has transmitted an emergency alert, if the unit is so equipped. But all system users should be aware of what crooks already know: These covert transmissions, in any channelized digital mode (TDMA, TETRA, P-25, and certain proprietary modes), are easily detected with common pocket-size frequency counters or, worse yet, with any cheap cellphone/CB antenna light widely available at truck stops and convenience stores for just a few dollars. So much for digital systems being "secure" and allegedly scanner-proof! Who needs a \$50,000 factory service monitor or network analyzer, or even a \$300 to \$500 scanner or frequency counter, when a \$10 antenna light will uncover covert transmissions?

Are Analog Comm Systems Being Rendered Obsolete?

Have you heard this allegation from a vendor? This is pure marketing bull. Such a statement is invariably an unqualified opinion and is not applicable in real-world applications at this point in time or anywhere in the foreseeable future. This, I suppose, is what certain wireless equipment vendors would like you to believe. Again, there is no truth to it.

OK. But some still say that a digital system can easily replace an existing analog radio system. Whoa! I see a huge consideration here. It's that business about easily replacing analog systems. Watch out, FM system administrators. What types of emission does your license authorize? On your existing system, your emission designator ends with an "F3E," and possibly one or two other designator suffixes for signaling or messaging. But in order to transmit digital voice or digitally encrypted speech modes, you must be authorized for an emission designator ending with "2E," such as "G2E."

Your existing license doesn't allow for digital voice transmissions? Oh, then it's not so easy to replace your analog system with a digital air-interface network, is it? Ouch! Go back to the FCC's Universal Licensing system—maybe even go back to your frequency coordinator—go back to square one. And wait. Oh yes, don't forget your checkbook.

Well, a VOIP system can possibly carry multiple voice and data channels on one digital RF carrier. In theory then, a one-channel site ought to function somewhat like a system with several channels. Sure, but to what degree of compromise, especially on the newer, narrower 12.5-kHz bandwidth? Think about packet rates versus bit error rates or frame error rates.

That half-of-a-channel is starting to become mighty crowded!

Many digital networks feature some sort of busy channel lockout, mechanisms for priority access, and such bells and whistles as internal timeout timers. There are many excellent system features, but these are hardly inherent to digital transmission systems. Somebody else thought of these years ago, long before digital voice radio became available.

Is this another "digital" advantage? A number of digital network vendors promote the use of **diversity reception** antenna arrays at their base sites. Yes, this is an excellent, workable, and proven technology. But here again, this feature is not exclusive to digital systems. Just so we know. Even more "digital features" being offered may include dynamic channel regrouping, dynamic mobile RF power output control, and (every public safety user's favorite) an emergency alert or "man down" button. Certainly, these are all very good features that enhance efficiency and safety. We just need to bear in mind that these, too, are not digital radio systems innovations or exclusives. And, as with certain other features, these are available on both analog and digital systems and have been for *decades*.

Some digital wireless communications systems are set up so that users and technicians can get real-time readings on both uplink and downlink bit error rates (BER) or frame error rates (FER), the bane of digital RF technology. In comparing various radio systems' real-world operability, note how often BER and FER are expressed as serious concerns in the world of digital wireless engineering. I see it quite often in digital RF engineering manuals. If the BER or FER is just a smidgen too high...whoops! There goes the signal. I mean gone! Analog modes users have no such burdensome consideration. Signal-to-noise (S/N) is usually easy enough to deal with. And a weak signal is certainly better than no signal at all. Keep it simple, Stupid, this senior RF engineer so often says. No wonder—simple functionality is especially important in matters of life-safety and critical homeland defense.

Here's a scary "digital" system feature: "priority access" levels. This feature exists, say the priority access proponents, so that the more "important" messages can preempt other traffic. However, the way nearly all such sys-

tems are designed to be set up, preemption or priority is provided to selected units and their users only. But most priority of communications levels in wireless systems are not dynamically assigned. That is, priority channels are *not* assigned on an as-needed basis and available to all units. Vendors' feature descriptions almost never provide any clearly visible mechanism to actually *prioritize messages*, and they fail to show how any given unit or user can gain priority for an actual emergency *message*.

Bear in mind that the Part 90 FCC two-way radio rules require that all other users on any given frequency yield to any and all emergency traffic (47 CFR §90.403). How does a particular wireless system's priority access system feature comply with this requirement? If your system has this feature, then you absolutely need to know! Civil and criminal liability regarding the operation of a non-compliant emergency prioritization system may well come to bear, primarily on the licensee (the system operator) when an emergency message is preempted by a bigwig who considers his call to say that he is running late more important than someone's life. Have you asked your equipment vendor about this? Now you may want to ask an attorney about this, as well!

Oh yes, I almost forgot to mention that "priority access" is again, as so many other features, **not** a "digital" innovation. It has been available in certain FM radio communications systems for well over 15 years!


You can have digital voice message storage capability. This is a useful feature, but (surprise!) has been around on both analog voice and digital networks

for years. Surely, then, text messaging must be a digital-only radio system feature. Various forms of text messaging have been available on many radio systems, whether analog voice systems or digital voice systems. Guess what? When transmitting digital data on an "analog" wireless system you are always, in that case, truly operating digitally. And all "analog" mode systems are capable of this type of digital operation. Did a wireless communications system salesman ever tell you that you need a "digital" voice system in order to transmit text or to connect to the Internet, and that "analog" radios could not possibly have many of the features described above? He lied.

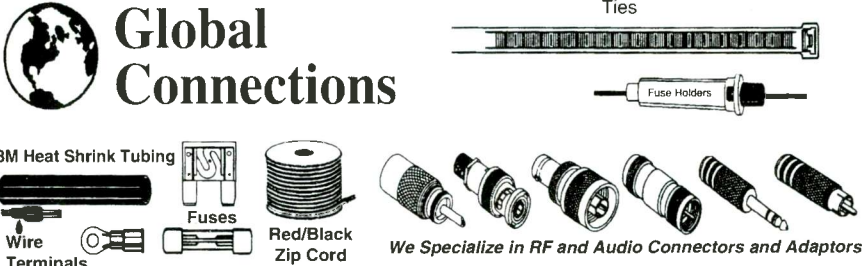
Pay Close Attention

Hopefully, I have presented a new, if not radical, approach to understanding wireless digital speech transmission technologies' abilities and limitations. No matter what technological advances you may be faced with in any area of interest, not merely radio communications, always remember this: "New and Improved" is usually neither and seldom both. So always consider your communications technology choices very thoroughly, from every conceivable perspective.

Please let our editor, Harold, and me know what you would like to see in future "Homeland Security" columns. What Homeland matters in the area of radio communication mean the most to you? Please write to me at <n3hoe@juno.com> and tell me. We'll see you next month with more communications news pertaining to homeland security! ■



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Position Polling: Boaters Get What Landlubbers Want

This month we'll take a look at the marine radio service and see what an under-\$300 marine VHF radio can do that has landlubbers envious. It's called position polling--press a single button on your marine radio, and presto, you see the position of your boating buddy pop up on a color LCD chart with the indication of bearing and distance to your own radio station.

One of our readers, Randy Stafford (RASFORD), writes, "...I am a tech guy, and I own a couple of pizza delivery shops. Some years ago I developed a point-of-sale computer system that grabs the caller ID info when they call in for a pepperoni. The screen pops up with their name, address, and order history. The computer tracks the order from dough to the baking and alerts the manager when the order should be ready to be delivered. Next, the delivery guys take it and disappears into the night..." Randy then points out that a cloak of darkness is cast over the order until, sometime much later, the driver reappears at the shop to report a successful delivery.

"For some time I have dreamed of a tracking system that would send me the current location of all of my drivers. My delivery area is about 10 miles in radius, so the little Garmin Rino GPS and FRS radio wouldn't stand a chance. Also, the driver needs to keep his hands on the wheel and wouldn't necessarily know that I position-pollled his vehicle," says Stafford.

These land mobile radio systems using GPS for position information are indeed available, but very expensive. The vehicle tracking set-up would probably work on a land mobile trunking system; every few minutes the vehicle squawks, and the dispatchers sees their position. Overland trucks are tracked using this same system on both cellular and the Orbcomm satellite system. When the Cadillac user gets stuck in the mud, their "On Call" button is a combination of their own GPS position from a simple GPS receiver into the cell phone system that databursts their specific position.

Yes there certainly needs to be a simple simplex business band, GPS-based, position-polling set-up priced around \$1,000. Boaters have it, and it's called Digital Selective Calling (DSC). To see how simple this system could be for vehicle use, let's take a look and see what DSC does out on the water.

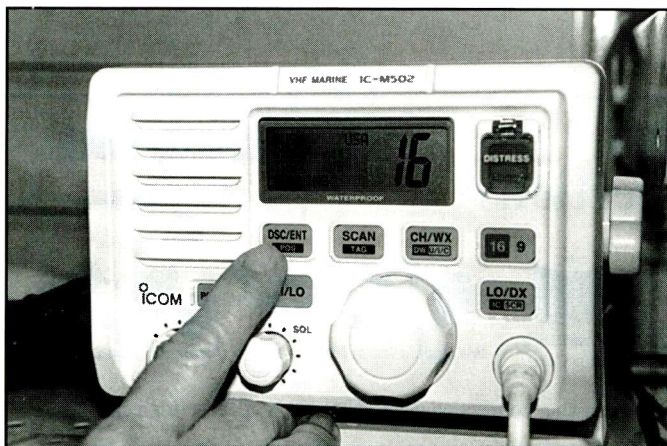
The marine VHF ship-to-ship and ship-to-shore radio band encompasses about 58 channels, 25 kHz spacing, around 156 MHz. The 156.800-MHz frequency is the international distress and calling channel. It is designated Channel 16 on marine VHF radios. When boaters have an emergency, they pick up the mike and holler "Mayday" for any other vessel within line-of-sight range to pluck them off the ocean.

But unlike the land mobile industry where a konked out vehicle is simply driven to the side of the road and the motorist waits for help, a boater springing a leak does not have that opportunity--they just sink. And sometimes, they sink quicker than they can pick up the mike and holler "Mayday" on VHF Channel 16, 156.800 MHz.

Global Marine Distress & Safety System

In 1974, a Marine Safety of Life at Sea convention developed a new radio rescue plan called the Global Marine Distress & Safety System, abbreviated GMDSS. It was fully implemented on February 1, 1999.

In local waters designated Sea Area A1, boaters up to approximately 30 miles offshore have a simpler way to holler "Mayday," and they don't even need to pick up their marine VHF microphone to make it happen. In addition to the Mayday call, this one panic-button distress signal contains the vessel latitude and longitude, as well as a ship identity number. The plastic red cover that protects this single panic button is part of the new marine DSC system. All newly manufactured marine 25-watt VHF radios must contain this DSC circuitry.



Entering your MMSI number into a DSC radio is easy if you follow the instructions.



Marine DSC position polling is inexpensive for boaters!



The Coast Guard Auxiliary tests DSC and position polling with 100 percent success.

You can spot a marine VHF with DSC circuitry by that big red plastic protector over the panic button. These are not expensive sets, some selling for as little as \$259 with included DSC capabilities meeting minimal standards SC-101. The marine VHF radio, like the ones pictured in this column, will send and receive the data format on marine VHF Channel 70, 156.525 MHz. No voice is allowed on this channel, only a DSC datastream.

The marine VHF with included DSC capabilities can be purchased for under \$400, with a \$300 typical street price. It features a wiring harness, labeled GPS NMEA IN, that comes out of the back of the radio. Radios like Standard Horizon also have GPS NMEA OUT, which is even better. A fixed or portable GPS set with NMEA position output attaches to GPS IN on the radio. If that GPS is built into the Standard Horizon chart plotter, the radio can receive a GPS position over the air-waves and send it OUT to that chart plotter to show the other boat's position.

Almost any type of GPS will work with a marine VHF DSC radio. If you now own a GPS set, see whether or not it has a



Red Cross communicators keep track of their ham operators using APRS, a ham form of position polling.

jack for "GPS OUT." If it does, make sure that you have menu-selected NMEA format and you are set.

The new marine VHF with DSC capabilities also needs a maritime mobile ship identity number (MMSI). These numbers are stored in both a national and an international database, so the Coast Guard will not only know the position of the vessel in distress, but will have a look-up for details about that vessel on the MMSI database. Marine VHF regulations no longer require local cruising boaters to have an actual FCC callsign or FCC marine station license, so the DSC MMSI number is obtained through any one of several private organizations dealing out their block of numbers. Many mariners are using the free service of MMSI number assignments by logging onto Sea Tow's website, www.seatow.com, and then selecting specific MMSI assignments.

Your MMSI number is unique to you, so you need to input that number into your marine VHF radio carefully to make sure your ID number matches your boat. VHF manufacturers show boaters exactly how to do this via menu options and knob twirling, but many boaters will leave it up to the local marine electronics guru because they read the warning that the number may only be entered twice before the radio goes into reject. This is to prevent someone messing with your radio and changing your number accidentally.

Putting It All Together For Your Safety

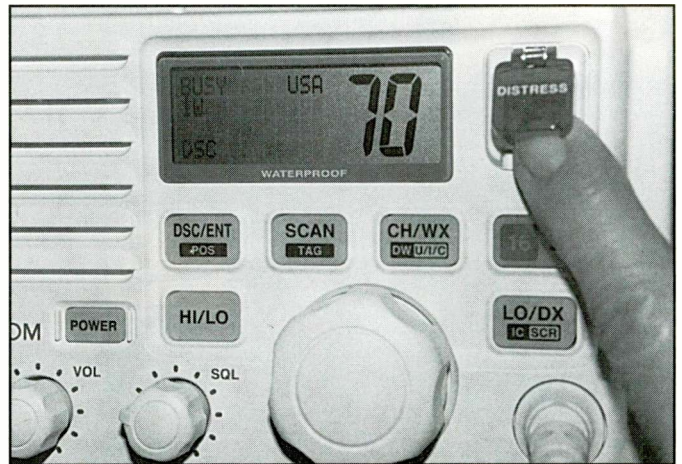
OK, so you have your new Standard Horizon Spectrum \$349 marine radio tied into any brand GPS, and your MMSI number is properly entered. You have also purchased a \$379 Standard Horizon CP150 electronic chart plotter to go along with your radio. The chart plotter takes a small cartridge to give you close-in chart details about the harbor or the little cove where you're cruising. Every rock, every reef, and every channel marker is on the electronic chart. And if you look carefully, you will also see your own position on that chart, too, thanks to the tie-in to your marine VHF.

So you are out there fishing, and everything is going fine until Jaws comes along and takes a bite out of your bottom. You are sinking fast, and you tell your buddy to lift the red plastic protective cover on your marine VHF, and give it a long button push. The radio makes a racket, the boat sinks, and you and the gang are bobbing around with no help in sight. Minutes later, the Coast Guard helicopter flies over, and the rescue is made, thanks to your marine VHF and digital selective call distress message with embedded position information and marine identity number. Oops, there could be a slight snag, because not all of the U.S. Coast Guard DSC stations are up on the air as of this writing, but be assured there are plenty of other boats and commercial tow boats listening in on DSC Channel 70 for any distress call in their vicinity. You WILL get help.

Your boating buddies are so impressed that they, too, get the same system, and with your new boat (thanks to insurance) you also re-equip with either the ICOM or the Standard VHF DSC system. You stay with Standard (ham manufacturer of



An inexpensive DSC marine radio with the big red distress button cover located on the bottom.



DSC calling on marine channel 70.

Yaesu Vertex equipment) because Standard has one option that no one else has in its price category: POSITION POLLING.

Next month you and your buddy are out fishing, each in your own boat and in different areas. You're pulling up nothing but old tires, but your buddy says that the fishing is great. Go into the menu of your DSC radio, select your buddy's specific MMSI number, and give the big button a long push. Since you preselected an individual call, you're not sending out an all-

ships Mayday call, but rather a specific call to your buddy along with a position request datastream. Presto, your radio acknowledges that his radio indeed received the position request, sent back his position, and presto, you look at your chart plotter and see an electronic icon of where your buddy is, pulling in fish left and right three miles due north of your position. If you have other friends out there with the same radio system, you can poll their position, too, as long as they are using the same brand of equipment from Standard Horizon.

It gets better: the local harbor patrol wants to keep track of all its patrol and fire boats throughout the 10-mile bay, so they, too, get the Standard Horizon equipment with the harbor patrol headquarters opting for the COLOR CP170C chart plotter with built-in GPS. (The mono \$399 CP150 also has built-in GPS.) Now all the harbor patrol needs to do to find out where his boats are is to send out a group call where maybe the last four numbers of the MMSI are the letter X. Presto, each of the boats automatically responds with its position, and this information is plotted on the screen. Boaters have been doing this inexpensively for several years.

Good News for the VHF/UHF Enthusiast CQ VHF is back!

After a two-year absence, the all-time favorite magazine for the VHF/UHF enthusiast - **CQ VHF** - is back to serve you. The new **CQ VHF** will look familiar to former readers. After all, the basic mission of the magazine is the same, but with editorial at a somewhat higher technical level than before. Within the pages of the New **CQ VHF** you'll find more meaty reading for the really serious VHFer than before. That's what our surveys told us you wanted, and that's what you'll get.

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What About Landlubbers?

So when will we have it for simplex land-mobile communications? Ham radio operators have been doing this for many years as part of their Automatic Position Reporting System (APRS). Land-mobile, low-power industrial frequencies are now being taken over by the no-license MURS (Multi-Use Radio Service). Under MURS's operation, a 10-mile radius might be covered with a base station with a relatively high VHF antenna with coax cable losses equaling a unity gain 2-watt ERP legal limit. With 2 watts on VHF, I bet a data signal could easily travel the 10 miles when the channel congestion lets up for just a second or two. Whether or not new MURS's rules would allow this type of unattended position polling will need to be sorted out; it may take waivers like Garmin was able to obtain in order to test the system to see if position polling is compatible with the MURS channels. If Garmin is doing something similar to position polling on FRS, I bet they may be in a position for coming up with something on land mobile frequencies, too. But for the water, Standard Horizon is your low-cost way for position polling. Look at the equipment at www.vxstd.com.

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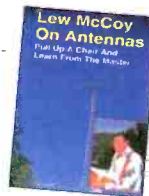


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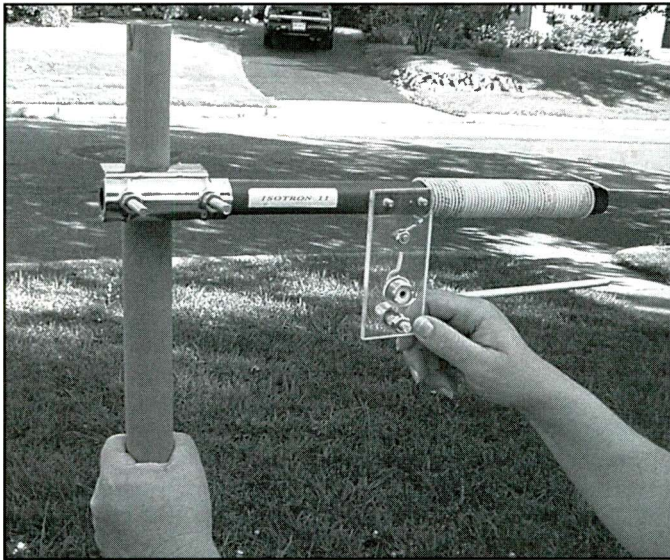
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The Bilal Company Isotron 11 Antenna



The Isotron 11 ready for testing on Channel 20.

A few months ago a reader pointed me toward the Isotron 10 antenna (the company makes a complete range of antennas for amateur use) and suggested I check it out, as it worked quite well for him. The Isotron 10 is, as you might expect, for 10 meters. I checked the Isotron ad in CQ, called Ralph Bilal in Colorado who makes these super antennas, and test drove the Isotron 10 from my New Jersey QTH. It worked so well that I decided to review their 11-meter model for *PopComm's* CB readers.

At first glance, this 16-inch, 1.5-pound strange-looking antenna doesn't even look like an antenna except for the obvious SO-239 protruding from the thick Plexiglas. That's actually good news, especially if you live in a neighborhood where large antennas are a problem, or your spouse gives you the evil eye when you're spotted in the backyard, planning your next antenna installation. Isotrons to the rescue!

The Isotron 11 comes completely assembled. Take it out of the box, connect your coax (weather proof it as you would any other antenna), mount it on a pole or even use it inside your house—in the attic, a ceiling crawlspace, or wherever—and you're on the air! Yes, it's one strange-looking antenna, but it works, and works quite well, indeed.

The antenna performs as a half-wave dipole and is tuned to the best SWR by moving a counterpoise up or down slightly. This is the only frequency adjustment for the Isotron 11. As the well-written instructions say, "If a higher resonant point frequency (point of lowest SWR) is desired, then rotate the counterpoise away from the coil a few degrees at a time. For a lower resonant point frequency, move the counterpoise closer to the coil or the plate." It's that simple! (Ensure the counterpoise and plate don't touch each other).

Finding the antenna's resonant point is a snap. In the case of 11 meters, tune your radio to Channel 20 or near a frequency where you intend to operate and listen to a signal. With the anten-

na on a short pole, bring your hand toward the antenna's top plate. Does the signal increase at some point as your hand approaches the plate? Your resonant point is higher than the channel you're monitoring. By a simple process of tuning your radio and moving your hand you'll determine the resonant point. The instructions are very clear and concise!

I mounted the Isotron 11 on two 10-foot poles. It comes complete with a sturdy mounting bracket, which is a cinch to attach to the pole of your choice. Of course, mounting location and surrounding objects can affect your SWR. I mention this because at the onset my SWR was about 3:1, but using standoff insulators for the coax (instead of simply taping it to the pole), relocating a nearby TV antenna, and adjusting the counterpoise, I achieved an acceptable SWR of 1.5:1. Your mileage may vary. I'd recommend grounding the poles.

From opening the box to airtime was a very reasonable 45 minutes; most of that time was spent fiddling with the nearby outside TV antenna pole. I used a 20-foot length of RG-58 coax and an MFJ SWR meter for my measurements. While I can't keep every antenna up that I review, the Isotron 11 is an exception, partly because it's practically invisible to neighbors and also because it's already up there. All things considered, this is an antenna that's practical, portable, and in my case, permanent!

Wait, There's More!

Bilal's Isotrons can be mounted back-to-back on the same pole. In fact, you can mount as many as three at the same height! To make these great antennas an even better value, they're designed so you can use a single feedline. That's right; for example, one length of coax operates the Isotron 10 and 11 antennas. They're connected together with the short length of twinlead. You find the resonant point for each antenna, adjust for the best SWR, and you're on the air.

The Isotron's radiation pattern is omni-directional, and polarization is random. There's no manual switching from horizontal to vertical.

Reception on CB channel 19 was outstanding! I'm about six miles from several major interstate highways. Reaching out on Channel 19 was just as easy as with my much larger—and highly visible—vertical antenna. I actually found there was less noise with the Isotron 11. I received several local signal reports on Channel 19, all reporting a very solid copy. On an upper channel using sideband, I reached an operator in Texas with ease. Was I surprised? Hardly. For an antenna that performs admirably locally, I'd also expect it to do very well for long distance when called upon.

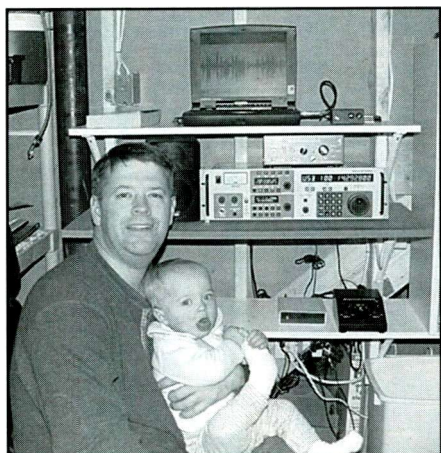
In a nutshell, Ralph Bilal has designed and built an amazing antenna for some 22 years. The Isotron 11 (and 10) isn't his only antenna. The company makes a complete line of HF antennas, and it now even has a 6-meter Isotron! Give Ralph a call at 719-687-0650 or send a letter to him at the Bilal Company, 137 Manchester Drive, Florissant, CO 80816, and he'll send you his latest catalog. He offers a complete line of amateur antennas for 160, 80, 40 (or 30), 15, 17, and 20 meters.

The Isotron 11 is \$78.95. Please tell him you read about it in *Popular Communications*. ■

v.i.p.

spotlight

Congratulations to Michael Manning of Newark, Delaware!



Here's Mike Manning with his daughter.. Radio equipment in his good-looking shack includes a Ten-Tec RX-340, Radio Plus Quantum Phaser, Sherwood Engineer SE-3 Synch Detector, and a homemade RF amp for the K9AY Loop.

processed. If you're E-mailing photos, please send them in a separate E-mail with your name in the "subject" line.

Our September Winner: Michael Manning

Mike tells us, "Shortwave Listening has been one of my passions since I was 11 years old. It was introduced to me by my friend whose father had a shortwave radio. We would listen to signals from all over the world. I soon bugged my parents into submission for the Ross Eleven Band radio. I got it Christmas of 1971. The bug was a fervent fever that brought hours of enjoyment.

My wife is very understanding and puts up with crazy antenna experiments. I have a Delta Loop (K9AY) and three beverage

Shortwave Listening has been one of my passions since I was 11 years old. It was introduced to me by my friend whose father had a shortwave radio. We would listen to signals from all over the world.

antennae. I enjoy mediumwave DXing for Transatlantic stations.

When I was in the Air Force stationed in Germany I heard KYW News Radio, Philadelphia. I have DX'ed from 5 continents and there's no place like home. I once strung out a 100-foot longwire behind my tent while serving a tour of duty during the Gulf War. I plan on getting my ham ticket soon, and I don't think my passion for the hobby will die."

Popular Communications invites you to submit, in about 150 words, how you got started in the communications hobby. Entries should be typewritten, or otherwise easily readable. If possible, your photo (no Polaroids, please) should be included.

Each month, we'll select one entry and publish it here. Submit your entry only once; we'll keep it on file. 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: "VIP Spotlight," *Popular Communications*, 25 Newbridge Road, Hicksville, NY 11801 or E-mail your entry to popularcom@aol.com, letting us know if you're sending photos. Please print your return address on the envelope if using the postal mail system. Not doing so will delay your submission being



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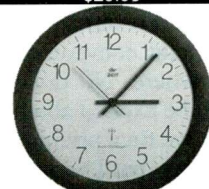
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New Product Roundup!

Over the past few months, several new products relating to the radio listener have come to my attention, and I thought it would be worth taking a closer look at a few of them. Many of these products were announced or at least featured at the Dayton Hamvention this year. Many, but not all are not yet shipping as of this writing but may be available by the time you read this. We'll try to get detailed reviews on as many as possible over the coming months, but there's a lot of excitement in the air right now.

Exciting Things At Hamvention

The annual Dayton Hamvention is always a major radio event no matter how you look at it, particularly for radio amateurs. I like to go through the convention with an eye out for products intended for the listener. I'm usually not disappointed! Unfortunately, this year some personal projects got in the way and I was not able to make it for the entire convention, so I may have missed a few things!

New From AOR

AOR stresses quality rather than quantity in their equipment line. There are some new and very exciting developments in the works at AOR, some of which are available now and some of which will be coming soon.

The most intriguing announcement is the AR-ONE, which has been advertised recently here in *Pop'Comm*. Unfortunately, there are no plans to make this excellent receiver available to the consumer market in the U.S. It features continuous coverage from 10 kHz to 3.3 GHz! One of the neatest things about it is the receiver's ability to remote the control head for convenient installation virtually anywhere. No doubt professional users will be excited about this receiver. I don't believe final pricing has been set as of this writing, but I would expect it to be in the \$3,000 to \$4,000 range.

One notable feature on the AR-ONE is the ability to control up to 99 of these receivers with one computer. For professional applications, this could prove very interesting. ICOM's CI-V interface allowed for similar multi-radio control, but only recently has software become available to do this. We'll probably be seeing more of this in the future, hopefully on receivers targeted more for the consumer.

The second very exciting development from AOR is the software receiver. This unit is currently being developed to process APCO-25 digital audio, but the door is open to other modes in the future. Intended for the commercial market, the APCO-25 receiver takes the 10.7-MHz output from a suitable receiver on any frequency (such as the AR-5000) and decodes APCO-25



The new AR-ONE receiver is unfortunately only intended for commercial markets at this time. It's quite a feature-rich receiver, as you might imagine.



While not new, this was the first time I had seen one of these up close. It's a cabinet that houses the AR-5000 +3 receiver alongside an SDU-5500 spectrum display unit. It's a completely functional and extremely fun to play with package!

audio. The receiver does not make any effort to follow control channels or other control functions, but rather acts as a decoder for the digital audio. Many applications in the commercial two-way market or testing equipment operating in a conventional mode come to mind. The price of the unit has not been set, but I would expect it to be at the high end for consumer equipment.

The AOR-8600 now has a B version, with improved performance the main feature of the upgrade. We'll have a full review on this excellent receiver very soon. This is a wide band receiver specifically targeted at the consumer. Coverage from 100 kHz to 2040 MHz makes this quite a communications receiver. Computer control is possible with the built in RS-232 port.



This is a prototype of the new AOR software receiver. This unit can currently receive APCO-25 audio and decode it—and it works really well! It does require the 10.7-MHz output signal from a conventional receiver to operate. The final production model will probably be in a different case.

A unique feature of the AR-8600 is the expansion card slot arrangement. There are five slots on the rear of the unit which can be used for various expansion options, including CTCSS tone squelch, additional memory, a digital audio recorder (loop recorder), a voice inverter, and a tone eliminator. These are the same cards that fit the AR-8200 series handhelds, except that all five can be mounted at once. Any two of the cards can be in use at one time.

AOR also introduced a new version of their loop antenna designed specifically for use with wideband receivers like the AR-8200. Performance from this unit is quite impressive, based on the limited demonstration I was able to get at Hamvention. Keep your eyes open for a more complete review soon.

OptoElectronics Goodies

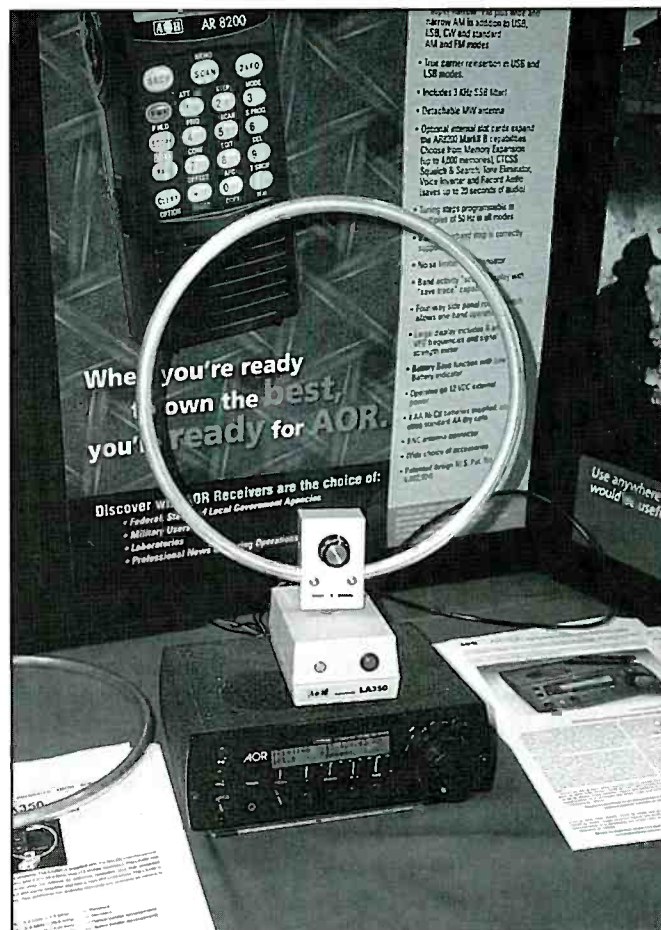
OptoElectronics also had their share of handy and fun gizmos! The recently introduced Digital Scout now has reaction tune capabilities that include the PCR-1000 receiver from ICOM. When the Scout detects a signal, the PCR-1000 is tuned to the frequency so you can hear immediately what the activity is. A special cable, available from OptoElectronics, is required to make the connection.

The Xplorer also received a minor upgrade which allows it to reaction-tune the PCR-1000 as well as a number of other receivers. The Xplorer is a wide-band sweeping receiver, so it has some capabilities to hear the audio on its own, but reaction tuning a separate receiver allows the signal to be received using the superior circuitry and sensitivity of the receiver.

The Optoscan Lite board for the PRO 2005/2006 is still available from OptoElectronics.

Probe Turns 7

Datafile has recently released its new version of Probe software for the Optocom and Optoscan receivers. The Optocom is a stand-alone “black box” receiver, while the Optoscan interface is a board that plugs into either the RadioShack PRO-2005/2006 series or the PRO-2035/2042 series. Sadly, the



The AOR Loop Antenna was specifically designed to provide a much needed antenna boost to wideband handheld receivers like the AR-8200.

receivers are no longer available (but show up on the used market from time to time), so you'll need to have one sitting around someplace to take advantage of the powerful features of this receiver control software. The OS-535 interface board, which fits the PRO-2035 and 2042, is still available if you can find a radio to put it into.

Probe's greatest strength has always been that it was written from the ground up to take full advantage of these receiver control systems. While other programs, such as ScanCat and ScanStar, offer excellent features for many radios, Probe's focus on the single receiver means that it can take full advantage of that receiver's abilities.

I'll have to admit that I really didn't think much could be added after version 6.0 was released a while back. The program features a complete frequency database as well as a myriad of scanning controls all designed to improve, or at least allow, extreme control over the types of signals that you receive. There are far too many highlights to enumerate here, but let's take a look at a couple in the context of one of the new features in 7.0.

Smartscan has always been one of my favorite features of this software. With it, you can set certain frequencies of interest to act as “triggers.” If one of these trigger frequencies goes active—say the aircraft emergency frequency of 121.5—the program (assuming you've set this up beforehand) will shut down whatever else you may be scanning and turn on a special “smart bank” that you've programmed beforehand to listen only to



The new Digital Scout can now talk to the PCR-1000 receiver with a reaction-tune cable. Here's quite a combination for all sorts of close-in monitoring of the action!

things related to aircraft emergencies. You might put the tower frequencies in there, the airport fire and rescue, as well as anything else you think might be related to an aircraft in trouble. If no further activity is heard related to the incident, after a timer expires the special bank is shut off and normal scanning resumes.

Well, as cool as this is, Probe 7 goes one step further with a new function called "TacScan." The idea is that any frequency that goes active is more likely to go active again in the near future. If you think about how two-way communications work, this makes perfect sense. A call is initiated by someone, and within a short time somebody else is quite likely to reply. This may go on for several exchanges and then the frequency goes quiet again.

TacScan watches for activity on the frequencies being scanned. Once something is found active, it can be put into the TacScan list for follow-up. Every "x" number of frequencies (a number you can set) the program goes back and checks those frequencies that were active just a few seconds or minutes ago (how long this goes on can also be adjusted). Since we know there was activity there once, it's much more likely that there will be activity there again, and this activity is likely to take place before the scanner circles through its entire list if you're scanning any number of frequencies.

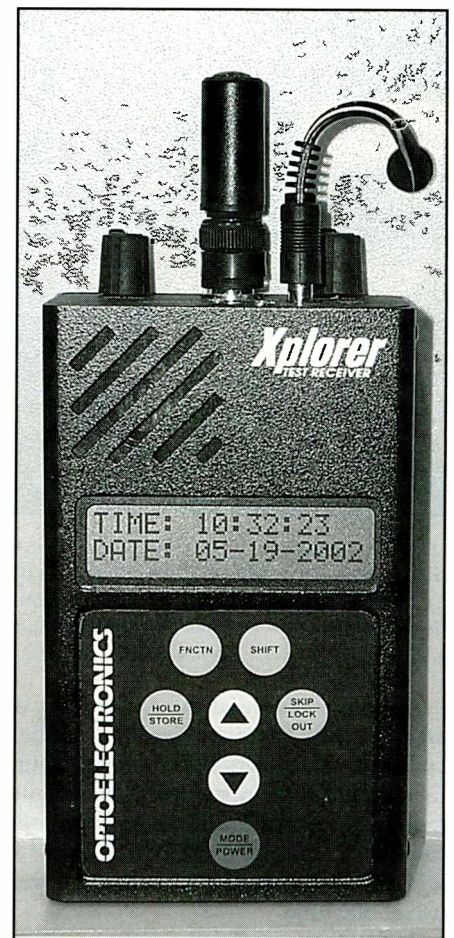
Once that conversation ends and a timer expires (you can also set this time), the frequency is dropped from the TacScan list, but is still left active in the regular scan list. If another conversation is encountered, the whole process starts over. All

of this is done without any user intervention once the options have been set to turn TacScan on and adjust the settings.

The net effect of all this is that you simply hear more of the conversation! Not only do you hear the initial call, but you also hear the replies. In a lengthy conversation you are much more likely to hear much more of the traffic than you would with a conventional scanner. I've run TacScan and a conventional scanner side by side and there is no question that you do hear more "continuity" on the TacScan unit. You may miss a few other things if the frequencies you're scanning are busy, but you can always turn TacScan back off!

Perry Joseph of Datafiles says that TacScan was originally developed as an aid in searching operations. By going back and listening to the frequency more often it was hoped that you'd be able to identify the channel more quickly and then either decide to keep it or get rid of it so you could concentrate on listening to other things. It didn't take long before the early testers of the software figured out that it also worked very well for normal scanning operations.

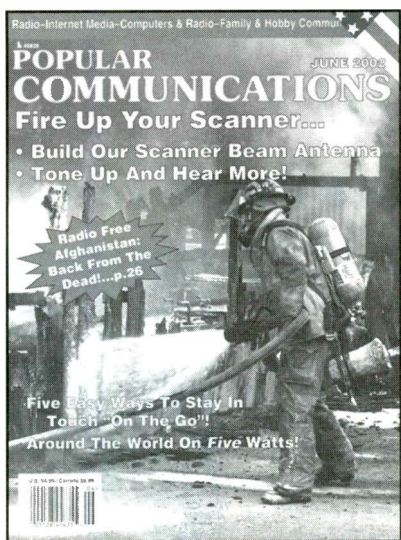
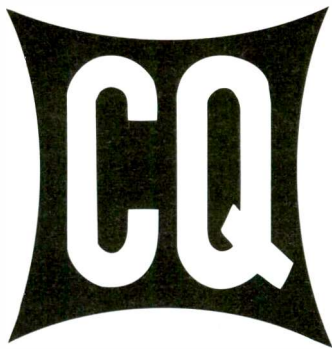
Probe's largest apparent Achilles heel is that it runs under DOS. Remember that stuff? With the widespread use of Windows computers, it would seem at first glance like a relic of a quickly passing era. I'm told this was done originally because the communications modules in Windows are not as efficient and the scanner operation and performance are compromised under Windows. Probe outperforms most competitors because of its emphasis on performance. Probe will run



The OptoElectronics Xplorer has received a facelift and a couple of new features. This is an excellent frequency hunting tool!

under a window on a Windows 95/98/ME computer, although somewhat slower. Even with the speed reduction the program is fully functional and faster than many Windows programs. Of course, programs like ScanStar and ScanCat have the Windows graphics interface and support many other radios, if that's what you're after.

You might want to have a second look, however. It quickly became apparent when I started using Probe some time back that I didn't really want to run my Optoscan equipped scanner without Probe. I certainly don't want my main computer tied up with scanner software. A 386 or 486 computer is enough to run Probe and DOS efficiently, and these machines are just about throwaways at this stage of the game. I found a 486 machine with plenty of hard disk space for \$20 and set it up to start Probe in the autoexec.bat file. It's a scanner computer and nothing else—I probably wouldn't want to do that with a more powerful machine. Apparently I'm not alone,



What's this? Why it's the CQ booth and Pop'Comm. Old weird Harold had escaped from his cage when this was taken, but security eventually brought him back.

according to Datafiles, and that's part of the reason this version is still in DOS.

You can get more information on their web site at <www.datafileinc.com>, or contact Datafile directly for pricing and availability for your particular configuration. They can be reached at <probe@datafileinc.com>. Users of prior versions should also contact them about upgrade pricing.

FM Transmitter

C. Crane Company has introduced an FM transmitter unlike any other in the market. This small and compact gizmo allows for retransmission of virtually any type of audio to any FM receiver. With the size of Walkmans, wrist watch receivers, and headphones with FM receivers built in, there's no place you can't listen to whatever you might care to hear.

Some suggested applications from C. Crane include retransmitting MP3 audio from your computer to your stereo, or using it in the car to transmit from a portable CD player to your car's FM receiver. I've used this method and it works quite well. Of course, there's no reason you can't plug in a scanner or shortwave receiver and listen to that anywhere in the house too! See a complete review of this excellent transmitter in next month's *Pop'Comm*!

September's Frequency Of The Month Winner!

Robert Cole from Cincinnati, Ohio, writes in to say that he heard absolutely

nothing on 118.9. Robert says, "Since this is an airport tower frequency, I didn't expect to hear anything.

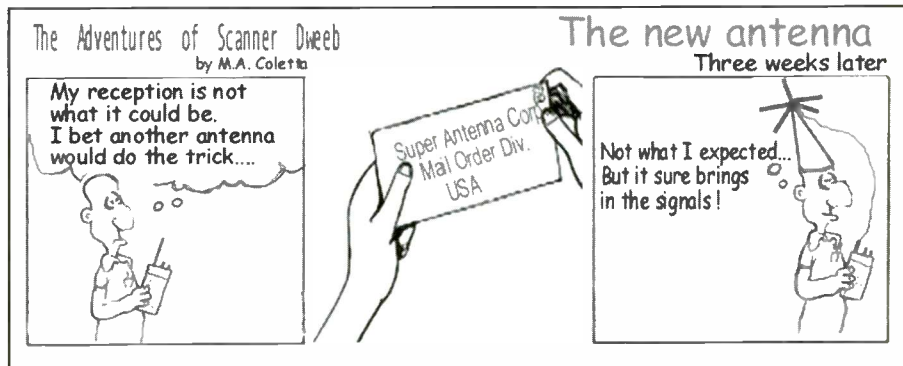
"Cincinnati Lunken Airport tower is on 118.7 and I can hear that because I am only 6 miles east of it...I suspect no one will hear anything on 118.9 unless they are fairly close to a large airport."

Well, Robert you're probably right. Unfortunately, ground distance isn't really a concern for aircraft transmissions, so the antennas are not really all that high off the ground. Remember, the receivers they're trying to talk to are at very high altitudes, so the line-of-sight principle works great! Thanks for having a listen anyway, Robert, and congratulations. Your subscription will be extended by a year!

I also wanted to apologize to the "non-air band" listeners we have. I wasn't paying attention and we've had two aircraft frequencies in a row. Of course, maybe you'll hear something and get hooked (he says with an evil smile).

This month's frequency is 154.160. Have a listen and let us know what you hear—or even what you don't. Either way, we'll enter your name in the drawing for a one-year subscription to your favorite radio magazine (as long as it's *Pop'Comm*, of course).

Send your results to <armadillo1@aol.com>, or via snail mail to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126. Be sure to put in the subject of the e-mail or on the outside of the envelope the frequency that you're entering so it can get to the right place. Until next month, good listening! ■



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The Vintage Service Bench: Variable AC Supplies

Things have changed in 40 years. In the '60s you still could find one or two mom-and-pop-style Radio/TV service shops on any Main Street, in any town. As vacuum tube technology faded away, so did the small independent service shops. Either the equipment was no longer worth fixing—part of our new throw-away society—or the high-end equipment worth repairing required sending things off to centralized authorized service centers. Besides, the solid-state equipment was inherently more reliable and less prone to breakdown.

Today, visiting any ham or electronic flea market, or Internet auction site, yields a plethora of quality radio and TV service equipment by Paco, Heath, Hickok, Knight, Leader, EICO, Sencore, B+K, and a litany of other respected manufacturers, often being sold for pennies on the dollar. This is buyer's market—a veritable equipment bonanza for the vintage repair enthusiast. Except for the high-end mutual conductance tube testers (coveted by the audio crowd), there is little competition for whatever test equipment you might be seeking.

I've been rather remiss in discussing what test gear is needed to align and service vintage receivers, as well as what would be nice to have but isn't a necessity. In past columns, we've hit on tube testers and their usefulness, but again most tube problems can be found by swapping a questionable tube with a known good one, or by troubleshooting.

A few columns back I reviewed the AADE digital capacitance and inductance meter, something of use for the more advanced experimenter or service person, but certainly not a necessity for the novice restorer. So, the question remains: What is the absolute minimum test equipment that a beginner needs to invest in? My list would include a good set of hand tools, at least one good VTVM (Vacuum Tube Voltmeter) or digital VOM (Volt Ohm Meter), and a decent vintage signal generator. A signal tracer is handy, but not necessary, as is a good scope. Both require some knowledge and practice to make them worthwhile investments.

Last month I briefly mentioned variable autotransformers and isolation transformers. There is a lot of confusion among newcomers regarding when, why, or how they should be used. Old-timers are about evenly divided on the issue: half have never used either device and don't see any need for owning either piece of equipment, while others swear by them. Whatever, they are valuable assets for the bench once their limitations are understood. Since this topic seems to come up weekly, with much debate on various Internet chat groups, it's a timely subject for us to cover. I'd put an isolation transformer at the top of the must-have list. Here's why.

Isolation Transformers

First, let's differentiate between what is a true isolation transformer and an autotransformer. A true isolation transformer has two fully separated and highly insulated windings to protect and fully isolate the AC line from the equipment being operated on the transformer output. One of the most common exam-



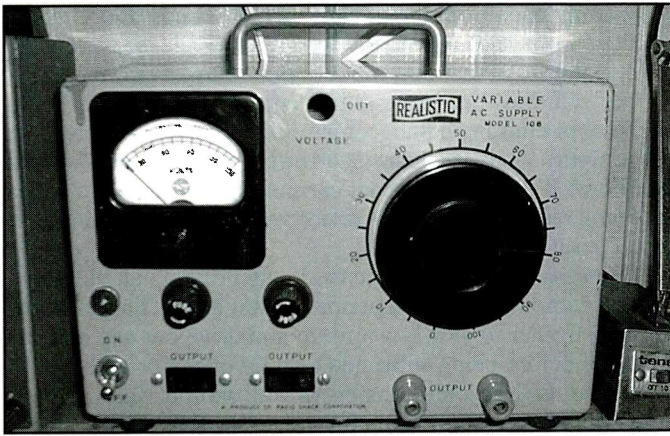
My RS-106 arrived with a damaged meter and meter toggle switch. I was fortunate to find a quality 0-150-Vac Simpson meter of the correct size in my junk box. The meter switch was eliminated, and the meter simply reads the output voltage.

ples is the old Heathkit IT-1 Isolation Transformer. Heath housed the transformer in a small test equipment enclosure, provided some simple metering and a 2-amp fuse for overload protection, along with a two-position switch to permit compensation for high or low line voltages. I've seen these units selling fairly cheaply on various Internet auction sites. You can expect to pay around \$15 for a Heath IT-1 in serviceable condition.

Other companies produced similar products, such as the B+K model TR-110. A few transformer companies also offer stand-alone isolation transformers that include a power cord entering one shell, and an AC receptacle on the other. The best quality ones (and most costly) are those rated for medical or hospital use.

The importance of owning and using an isolation transformer cannot be overemphasized. If you are going to work on hot chassis AC/DC sets, you'll need one to keep the chassis isolated from the AC line, which has the neutral side of the AC line grounded at the fuse box. Otherwise, you risk electrocution if you should happen to come between a hot chassis set and a nearby ground, which could be any piece of grounded test equipment on your bench! Also, many transformer sets use caps between the line and chassis. If these caps are leaky they can present serious shock hazards.

Now's a good time to advocate using a Ground Fault Interrupter (GFI) on the power outlet supplying AC to your bench! They're cheap and can save your life. They work by sensing current imbalances between the neutral and hot sides of line. Such a condition indicates that leakage current is flow-



A means to measure the AC voltage and current must be provided. The vintage wood-cased Weston 0-5-amp AC current meter is quite a time warp next to my Fluke 77 DVM, which can measure AC current up to 10 amps and AC voltages.



Heath's SP-5220 variable AC supply is the answer to workbench clutter! AC voltage and current metering, overload protection, isolation transformer, and a variable autotransformer are housed in a single compact enclosure. The meter scales on this Heath are large and easy to read.

ing to an external ground. If you happen to be part of that inadvertent leakage path, the device will trip before 5 mA of current is reached, protecting you from possible electrocution.

Now, what a GFI or isolation transformer cannot do is protect anyone who happens to place themselves between the hot and neutral leads! Old-timers advise to "always work with one hand behind your back" which is good advice as it keeps you from accidentally touching something with the other hand that could provide an current path through both arms and the heart!

Another use for autotransformers is to power 220-Vac devices from 110-Vac lines, or vice versa. Sooner or later you will run across a European set that requires 220 Vac. For this purpose you can use a 110/220-volt dual-primary transformer as an autotransformer in either step-up or step-down configuration.

Variacs: The Real Story!

The next item I advocate is a variable AC autotransformer on the workbench. The most recognizable trademark is Variac. You'll hear this trademarked name used as a generic reference to all brands of variable autotransformers without regard to manufacturer. Variac is a trademark of Staco; visit <[**FREE
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variatic.com> for more info. I suspect the name results from combining VARIABLE AC transformer into the abridged Variac moniker.

A variable autotransformer allows the AC voltage to be set over a range of voltages from 0 to upwards of 140 volts or so. The AC voltage is fed to a fixed tap on the autotransformer's lone primary winding, while a wiper arm taps the output voltage. Depending on whether the variable arm is below or above the fixed tap determines whether the transformer is working as a step-down or step-up transformer. Note that there is no isolation provided between the input and output sides of the AC line, thus there is no shock protection inherent in the design. Many beginners mistakenly assume that these also provide AC isolation, which is not correct. A variable autotransformer must be used in conjunction with an isolation transformer for maximum safety!

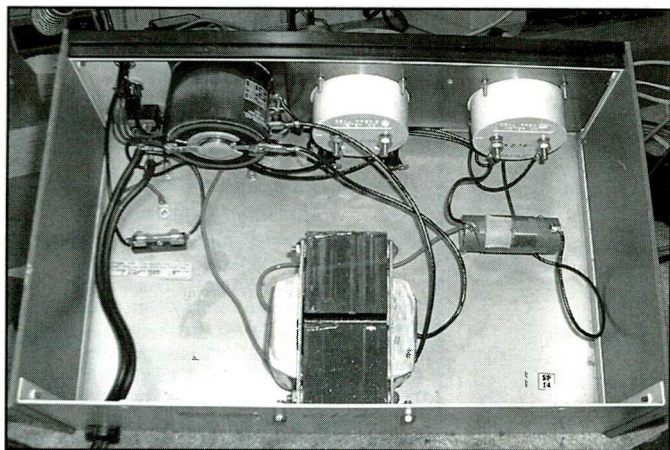
Variac In A Box!

Some years ago a fellow collector gave me a rather dated RadioShack Realistic model 106 variable AC power supply. Besides a hefty 5-amp variable autotransformer, it also includes metering for the input and output voltages, front-panel fuses for the input and output, and two isolated AC plugs and isolated AC output on binding posts, all enclosed in a convenient metal cabinet. Again, any number of TV/Radio test equipment vendors produced similar items; EICO's model 1078 comes to mind, for instance.

My Realistic 106 could be combined with a Heath IT-1 isolation transformer to provide an isolated and variable AC supply for my workbench. Whatever arrangement you choose to use, you will need to be able to measure the output voltage—a good VOM or DVM (Digital Volt Meter) will do here—and having some means to measure the AC current being supplied to the device under test is a must. Again, most modern digital meters have AC current positions, typically up to 10 amps, which can be used for this purpose. Also, remember that the variable autotransformer will have a maximum current rating (typically 1 to 4 amps for smaller units) and should be fused for that amount, or less. Isolation transformers have VA (VoltAmperes) ratings; for example an isolation transformer designed for 115 Vac at 3 amps would have a 345 VA rating.

The Ultimate Solution

Wouldn't it be nice if someone would combine everything in one package: a variable autotransformer, isolation trans-



Looking inside Heath's SP-5220 variable AC supply shows a relatively uncluttered and neat internal layout. Note the ample isolation transformer and the variable autotransformer (it looks like a large donut) on the front panel.

former, AC current and voltage metering, and fuses—all in one handy cabinet? Enter the Heathkit IP-5520 (SP-5220 factory wired) Isolated Variable AC Supply! This neat product was introduced by Heath in the 1980s and combines dual 1- and 3-amp AC current metering, AC voltage output metering, and an internal isolation transformer and variable autotransformer. The unit is dual-fused for either 1 or 3 amps (selected with the AC current meter range switch). Few radios will draw much more than 1 or 2 amps!

These units are frequently listed on eBay's Internet auction site at prices ranging from \$30 to over \$200. The wide price spread range depends on several things: who is looking at the time, how many are being auctioned within that time frame, and the condition of the instrument. Quite a few of these seem to be coming from technical schools. (Perhaps this is another omen that the electronic technician field is in decline?) My winning bid of \$61 on eBay a few months ago got me mine—quite a bargain considering its decent condition and desirability. It certainly makes my life easier having every important feature located in one convenient package!

The B+K 1655 variable/isolated AC supply is very similar in performance to the Heath unit, but B+K uses circuit breakers instead of fuses, and the instrument also includes a unique current leakage measurement capability that the Heath model lacks. I'm pretty sure I've seen similar units made by Leader and others.

First Time Power Up

There are several schools of thought on whether an as-found radio should be powered up for testing. Some folks claim they are quick enough to pull the AC plug at the first sign of trouble, while others relate how they like to slowly ramp up the AC voltage while keeping an eye out for signs of trouble. A few even claim slowly ramping up the AC line voltage is a good way to reform electrolytic caps. Ouch!

My opinion differs. There's little to debate regarding the condition of 60-year-old consumer-grade capacitors. They should be replaced. The only exception might be to test the set's power transformer for internal problems—a bad transformer might make or break a potential sale, or strongly influence the estimated cost of a restoration. The best way to do so is to remove all of the tubes from the radio, which will kill the B+, and also

remove all loads from the transformer secondary. Once this is done, the voltage can be slowly brought up while measuring the quiescent transformer current. If shorted turns exist, the transformer will draw excessive idling current, and probably begin smoking or emitting a pungent burning odor after a short time. Electrolytic caps—if you insist on trying to save them—should be reformed using an external current limited supply, a series dropping resistor (10k-ohms or so) will limit the forming current to a safe few mils or less.

It's probably good practice to slowly bring up an old transformer, without load, over a period of a few days. This will allow the transformer to slowly warm up and drive out any internal moisture before being subjected to full voltage or load conditions. I've also had some transformers fail without warning, days after a set was restored. Sometimes shorts will develop between adjacent turns because of poor enamel insulation. Unfortunately, there's little that can be done to save them.

Voltage-Sensitive Problems

The variable/isolated supply is a good means to diagnose potential problems in sets that have been restored; slowly ramping up the voltage while watching the current meter for abnormally high readings will help spot wiring errors, or (gasp!) signs of smoke. Intermittent conditions, especially common in battery tube sets, such as the Zenith Trans-Oceanics, often show up as the AC line voltage drops a few percent. This is usually indicative of a failing selenium rectifier, but there can be other causes. Checking a set's operation at slightly low and high AC line voltages can help diagnose problems that would otherwise go unnoticed.

Remember that the rectifier tube will only begin to conduct once the heater or filament reaches a certain temperature. In other words, the set will rapidly start developing B+ once a certain AC line voltage is reached. The B+ will not linearly follow the AC voltage from 0 up to 125 volts. One way around this is to build a few solid-state rectifier plug-ins to substitute for the vacuum rectifier while these tests are being performed. A four-pin base and two 1N4007 diodes will do for the popular 80, while two salvaged octal bases will do for a variety of directly and indirectly heated rectifiers, such as the 6X5 and 5Y3, respectively.

One caveat for directly heated rectifiers: If the set uses capacitive input filtering, and the diode cathodes are connected to the opposite filament pin, the set might produce a bit of hum since the rectifier filament AC voltage (5 volts) will be imposed on the DC rectified voltage. This won't make much difference for testing, but the hum will be noticeable.

Other problems, such as local oscillators that drift excessively with varying line voltages, or weak tubes with failing cathode emission at low filament voltages, can be spotted using a variable AC supply.

Hot Chassis Sets

A line isolation transformer is essential when servicing these radios. For example, a bench VTVM's probe ground is connected to the chassis for most voltage measurements. This means the VTVM's metal cabinet will be at the same potential as the radio chassis—possibly 120 Vac—without an isolation transformer inline! If the VTVM sports a modern three-conductor cord, sparks will fly.

Well, I've run out of my allocated space for this month, but will be back with more restoration tips and examples! See you then, and keep those soldering irons warm. ■

Pop'Comm Survey - September 2002

Circle Survey Card

If available and affordable, would you prefer to have a permanently installed true mobile phone in your car, truck, or SUV: (Check all that apply)

- Yes, if I could still have a portable wireless phone at little or no additional expense. 1
- Yes, a full-power mobile phone would be very nice. I don't really need a low-power portable phone. 2
- Yes, that way there is no danger of forgetting to take my wireless phone on the road with me. 3
- No, I find the portability of a handheld wireless phone to be very useful, and it works in the car as well. 4
- No, I don't have/don't want a wireless phone. 5

Is your own car, truck, or SUV equipped with any form of telematics: (Check all that apply)

- Yes, I have original equipment, factory installed telematics system such as OnStar, etc. 6
- Yes, I have recently added a telematics device such as a cell phone, two-way radio(s), GPS unit, aftermarket dashboard PC/stereo combination running Windows CE, etc. 7
- Yes, I have had two-way radios, a mobile phone, or other electronic communications and/or navigational gear in my vehicle for quite a while. 8
- No, I have no interest in vehicular communications or navigational equipment. 9
- What is "telematics"? 10

Have you learned anything either new or useful about telematics in Pop'Comm: (Check all that apply)

- Yes, I had never heard of "telematics" before. 11
- Yes, I had heard the term but never knew exactly what telematics was about. 12
- Yes, although I was already somewhat familiar with the telematics concept. 13
- Please tell us more about telematics developments in upcoming issues of Pop'Comm! 14
- Perhaps, but I am really interested in only one or two aspects of mobile electronics, such as mobile CB radio. 15
- No, I have no interest in telematics. 16

our readers speak out

Each month, we select representative reader letters for our "Pop'Comm P.O." 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 "Pop'Comm P.O." 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>.

Reflection Of Society?

Dear Editor:

I certainly agree with the comments of Mr. Perez concerning the current state of affairs on CB. I remember the thrill of discovering CB as a kid growing up on Long Island during the '60s. I got licensed, and happily my paper route could pay for my participation. I left CB behind during my years in the Army. In 1988, I went into trucking. My reintroduction to CB was quite a shock. Today it's almost intolerable.

Sadly many of my fellow drivers are responsible for the downfall along with many irresponsible operators of base stations. Channel 19 (17 on the west coast) are virtually useless to professional drivers in many areas now. CB has become an audio reflection of the sicknesses which infect our society. Who else is to blame except those behind the microphones?

Many times I've heard "Well driver if you don't like it you can turn it off." Indeed I can. More importantly the FCC can turn the band off permanently. The agency just might do it too.

Don LaRegina
Enterprise, AL

Grundig SW Review

Dear Editor:

I wanted to let you know that I read with great interest the review of the Grundig Mini 100 PE in the May issue of *Popular Communications*. I have been looking for an inexpensive shortwave radio for my young daughter to use so we will not fight over my "real" short-wave radio when I am listening. After reading the review, I thought the Grundig would be just right for her - small and not too hard to operate. I did not really believe that it would be capable of picking up much, but I thought it would keep her happy.

I was incorrect in my assumption of reception on the Grundig. I can easily pick up most of the major shortwave broadcasters. Its small size makes it perfect to carry around while doing yard work, and the fading is not too bad to make listening a bore. With digital keypad tuning and audio muting with the control knob on my regular shortwave radio, you do not know what might be just down the dial from your target. The analog tuning adds a little excitement when tuning around the bands since you can hear every station that you tune across. The review was certainly correct in that the Mini 100 PE is not well suited for a serious DX'er, but it is really a good radio for a casual short-wave listener. Unfortunately, I now must find another radio for my little girl.

73's,
Joe Kenneth Wood
Gray, Tennessee

Final MURS Rules Released

The FCC has issued a *Memorandum Opinion and Order* which includes final rules for the Multi-Use Radio Service (MURS). In the Order, the Commission clarified that MURS is intended to be a "two-way, short-distance, voice or data communication service intended for transmissions that do not typically require long duty cycles." As such, MURS will not be restricted to Part 90 Industrial/Business Pool users, but can be used by the general public for communications related to personal or business activities. The Commission also affirmed the decision to eliminate individual licensing for MURS and instead license-by-rule five VHF frequencies (154.570 MHz, 154.600 MHz, 151.820 MHz, 151.880 MHz, and 151.940 MHz) that were formerly licensed under Part 90 for low-power, industrial/business use, by placing these frequencies in MURS (Part 95 Citizen's Band Radio Service).

Technical considerations were also addressed. Under the revised MURS rules, transmitters are permitted to have: detachable antennas; external antennas up to 6.1 meters (20 feet) above a structure or 18.3 meters (60 feet) above the ground, whichever is higher; and total power output (TPO) of up to two watts. Units are not permitted to be used as cordless telephones, radiofacsimile (imaging), or for continuous carrier mode operations; and are not permitted to be used for repeater operations or as a signal booster.

Wiretap Legality Case Goes To Supreme Court

The U.S. Supreme Court is slated to hear oral arguments regarding the privacy of cellular telephone conversations. At stake is a decision about whether federal and state laws preventing people from using information obtained through illegal wiretaps violate the First Amendment. *Bartnicki v. Vopper* and *U.S. v. Vopper*, will go before the highest court in the nation on December 5. Pop'Comm first reported on these cases last year. Both cases involve a 1993 intercepted cell phone conversation between Gloria

Bartnicki and Anthony Kane, officials of the Pennsylvania teacher's union. The call was recorded, handed over to local radio personality Frederick Vopper, and played on the air. Bartnicki and Kane filed suit under state and federal statutes that mandate penalties for those who use wiretapped information when they suspect or know that the information was illegally obtained. The legality of Pennsylvania's wiretapping law, as well as portions of the Electronic Communications Privacy Act, both dealing with "penalties on those who use or disseminate information gathered through tapping into wireless, oral or electronic communication" will be determined by the Supreme Court. The actual legality of civil and criminal penalties imposed on those who take part in the wiretapping is not at issue.

Cell Phone Law Updates

The state of **Mississippi's** House and Senate both voted to override the governor's veto of legislation that would prohibit cities and counties from adopting ordinances restricting drivers' use of cell phones. Lawmakers will study the issue and consider statewide regulations. Meanwhile, **Connecticut** Station Representative Richard Roy (D-Milford) is again pushing for legislation that would restrict drivers' use of hand-held cell phones. And up in the frozen North, **Alaska's** House Judiciary Committee, citing lack of support, tabled a bill that would restrict the use of handheld cell phones by drivers.

VoiceStream Gets Priority Access Waiver

The FCC has approved a petition for waiver of priority access rules. The waiver, given to VoiceStream Wireless Corporation, will allow the company to begin giving priority access to its network for calls placed by U.S. national security and emergency personnel during emergencies.

Meanwhile, the U.S. National Communications System has announced

approval of a subcontract award to VoiceStream to provide Wireless Priority Access Service for the Washington, D.C. and New York City Metropolitan areas. Wireless Priority Service will allow certain emergency and national security officials access to wireless services in times of national emergency or crisis when network congestion may affect the ability to place cellular phone calls.

Amateur Asks For Mitigation Of Orbital Ham Satellite Debris

Amateur radio operator Nickolaus Leggett (N3NL) has filed a comment with the FCC regarding mitigation of orbital debris (IB Docket No. 02-54). In his document, Leggett encourages the Commission to "structure the debris mitigation rules so that they will encourage the design and construction of amateur radio satellites that reduce their own debris potential while at the same time demonstrating new satellite systems." According to Leggett, a way to do this is to allow amateur satellites operating in a storage or disposal orbit to avoid having to meet any other debris mitigation standards. "The Commission should exempt amateur radio satellites from any requirements for debris mitigation for a period of ten years. After that period of time has expired, amateur radio satellites would be subject to debris mitigation standards. Amateur radio satellites operating within storage orbits or other safe orbits should be permanently exempt from debris mitigation standards and requirements."

Ham Radio Buff Hoards Surplus Radio Gear

According to his defense attorney, **Steven C. Hayes** was a tech nerd who liked "any shiny little thing with a dial on it." Maybe this explains why Hayes, a Forest Service technician and ham radio operator, collected surplus government radio equipment. Not just a few radios, either, but \$9 million dollars worth of equipment that he obtained while working for the U.S. Forest

Service. Hayes, 42, was originally tasked with obtaining surplus equipment from the Fort Lewis Defense Reutilization and Marketing Office for use by the Forest Service. Unfortunately, he got a little carried away. In the end it took 16 one-ton truckloads to haul away what was stored at his home. No one knows just how much equipment Hayes had his hands on, or what he did with it all, but he has admitted to using some of the equipment for his hobby and selling another \$4,000 worth. In March, he was convicted of theft of government property and sentenced to 18 months in federal prison. (Thanks to Kito Kaneta for this story.)

APCO Asks For Interference Reports

The Association of Public Safety Communications Officers is collecting 800 MHz band interference incident reports. "Now that the FCC has issued its NPRM to address the interference to public safety, Project 39, and in particular the Technical subcommittee, has determined there is a dire need to promote the reporting and logging of both new problems and follow-up reports of problems that have been previously reported." APCO has created a questionnaire at www.apco911.org/afc/800intefere.htm. If you're an 800 MHz band user who has experienced interference, drop by the APCO website and let them know.

Florida Frequency Crunch

The State of Florida, citing frequency congestion, has asked the FCC for a waiver to use eight offset frequencies in the 800 MHz Public Safety band. The offset frequencies, located between regularly assignable channels, are 811.4500 MHz, 812.4750 MHz, 812.9750 MHz, 813.4750 MHz, 856.4500 MHz, 857.4750 MHz, 857.9750 MHz, and 858.4750 MHz at Fort Meade, Florida, and 811.9500 MHz, 812.9500 MHz, 813.9500 MHz, 814.9500 MHz, 856.9500 MHz, 857.9500 MHz, 858.9500 MHz, and 859.9500 MHz at Englewood, Florida. The frequencies would be used for Florida's 800 MHz trunked statewide law enforcement radio system.

Orbcomm Gets Satellite Modification OK

The FCC has authorized Orbital Communications Corporation (Orb-

comm) to modify its low-Earth orbit non-voice, non-geostationary mobile-satellite service system in order to meet customer requirements without increasing the potential for interference with other so-called "Little Leo" systems. Orbcomm has been given the okay to decrease the number of satellites in its two highly-inclined orbital planes, operating the fourth plane of satellites at 45° inclination, and increasing the altitude of the satellites in the equatorial plane of its system under certain conditions. Orbcomm shares its uplink spectrum in the 148-149.9 MHz frequency band with three other companies: Leo One, Final Analysis, and E-SAT, Inc. Downlink in the 137-138 MHz frequency band is shared with E-SAT.

"Automatic On" Radios For Emergency Warnings

The Partnership for Public Warning is asking radio and television broadcasters to consider technology that would enable government agencies to turn on consumers' televisions and radios in order to broadcast warnings in emergencies. Radio and TV broadcasters and cable companies have had equipment available since 1997 enabling them to send a signal to turn sets on, but currently, manufacturers aren't required to make sets that can respond to the signal.

Unlicensed FM Radio Operator Arrested

The Federal Communications Commission announced that an investigation by the Enforcement Bureau has led to the arrest of **Paul Dorleans** for operating an unlicensed FM radio station on 87.9 MHz in Brooklyn, NY. The United States Marshals Service, along with FCC agents and the Office of the United States Attorney for the Eastern District of New York made the arrest after enforcement actions failed to deter Dorleans. More than 20 unlicensed stations have been shut down so far this year.

Maritime Communications Change

The FCC has issued a Report and Order (FCC 02-102) adopting changes to **Part 80** of the Commission's Rules governing maritime communications. The request for changes were made by the National GMDSS Implementation Task Force and

Globe Wireless, Inc., in order to address new international maritime requirements, improve the operational ability of all users of marine radios and remove unnecessary or duplicative rule requirements. The Commission has extended the fishing vessel exemption from Global Maritime Distress and Safety System (GMDSS) requirements until one year after the United States Coast Guard establishes Sea Areas A1 and A2, established a Restricted GMDSS Radio Operator's License, and authorized the USCG or its designee to issue a Proof of Passing Certificate (PPC) that would allow operators to obtain an FCC GMDSS Radio Operator's License. Other changes include the modification of certain sections of the Rules to implement international standards, the imposition of a mandatory watch on Channel 70 for voluntary vessels, the allowance of J2B and J2D transmissions on frequencies currently reserved for Morse Code transmissions, the removal of certification for Class S emergency position indicating radio beacons (EPIRBs), and the elimination of Subpart Q and the streamlining of Subpart R of Part 80 of the Commission's Rules. ■

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Making Friends, Repeater Style

Earlier this year I got into a rather heated discussion about repeaters after I read a letter from a new ham who was complaining bitterly about the fact that nobody would answer his calls on local machines. Initially, I warned newcomers about relying too much on repeater contacts early in their ham radio careers and suggested weak signal VHF or traditional HF activities until they had more experience under their belts. Readers responded with stories of their own - some good, some bad. Well, after a couple of months and a couple of non-repeater topics, I'd like to pick up that thread again for a brief how-to on making friends and overcoming jitters for new ops destined to work through local or faraway machines.

Making your first repeater contact or even your tenth can be a bit unnerving, so let's start with the basics. Punch up the local repeater frequency and listen. Nothing. No QSOs in progress, no weather reports, no machine-spoken IDs can be heard. This is the moment you've been waiting for. It's D-day, and you're ready to hit the beach! You key the mic and, in a confident voice, announce, "This is NT0Z listening!"

The repeater works its magic. Somebody has to be reaching for a microphone, right? They'll respond any second now, won't they? The seconds stretch on. You repeat your call, perhaps sounding a bit less confident. Still there's nothing.

Just when you're about to give up and hit the big switch, the repeater comes to life!

"WD0BDA this is WX0ABC. You around, Fred?"

Anger flares, replacing your former feelings of isolation. You realize that at least one of those guys was probably on frequency and listening when you made your calls. Why didn't they answer you? Is it because you're a newbie? Do they hate you already? They don't even know you!

The latter, as you'll discover, may be the nature of the problem. (And that is exactly where the previously mentioned new ham - the one who wrote the letter that started this topic - found himself.)

Cat Got Your Tongue?

Ham radio is all about communicating - with one great contradiction: Most hams are painfully shy! Want proof? Go to any hamfest and watch how clusters of ham buddies talk up a storm *with other hams they know*. Outside their respective groups, most attendees walk around in relative silence. Some are even difficult to engage in conversation! When I'm working my hamfest table, I take secret pleasure in calling out the shy ones and making (encouraging, helping, forcing) them talk to me. Like a circus barker I get in their faces and start some friendly chatter. Most speak up but some actually turn around and run away! And these guys studied to pass difficult exams for a communications hobby?

A friend of mine thinks it has to do with the nature of Amateur Radio itself. I tend to agree. You see, when you're on the air talking up a storm to some other ham in Oregon, say, you're *invisible* (SSTV and ATV modes excepted). You don't have eye contact. You could be reclining in your boxer shorts or standing on your head - whatever. The world is at arm's length. Through ham radio, people who might be fearful of close, personal communications still get to communicate.

Breaking the shyness barrier is what's necessary to make those first repeater contacts. When you announced that you were listening, more than a dozen other ops probably heard you. They heard you, but they probably didn't *know* you. They were all waiting for someone else - and they knew there were others listening on frequency - to break the ice. If everyone waits, nobody responds!

This scenario is repeated (pun intended) on machines across the country many times a day. The problem isn't you, or that you're a new ham. It's that you're a stranger, an unknown quantity.

Breaking the Ice

If you keep announcing that "you're listening," someone will eventually reply, but it might take a while. An easier approach is to become part of an existing repeater conversation.

Monitor the repeater and listen for opportunities to join in, even if you're just asking a question.

"WD0BDA from WV0XYZ. I'm definitely gonna order that Northwest Off-Road header for my Toyota. I think it's the best way to get the extra horsepower for pulling my camper."

"I don't know, Fred, I think you should start with a carburetor and a cam tweaked for towing power."

Here's your golden opportunity to jump in and make friends. If you don't know anything about building hot-rod 4X4s, just ask a question! If you do, pop in and contribute your two cents worth. In a pause between transmissions, announce your call sign.

"NT0Z"

"Whoa, there's a new voice! Ah, NT0Z, this is WD0BDA. How can I help you?"

"Hi, my name is Kirk and I live in Little Falls. I couldn't help overhearing your discussion and I wanted to suggest the Performance Products header over the Northwest Off-Road. It's a lot easier to install and it provides more horsepower for towing. And if you change the cams, you'll wind up replacing the rockers and the valve springs. It's a lot of extra work."

At this point, you're no longer a stranger, at least to these guys and those who are lurking on frequency. Make enough conversations of this type and you'll gradually wear down the opposition. In time, your call sign will be familiar to everyone who regularly uses the machine, and when you say, "NT0Z listening," you'll get replies. After all, these people now know you!

Another way to get to know repeater-dwelling hams is to attend ham club meetings. Make friends there and you've made friends on the repeater!

Through that local club, volunteer for various public service activities. Helping out at public service events is rewarding in ways beyond the accumulation of ham radio friends. Try asking for a signal report instead of just announcing to the world that you're listening. When potential responders have a reason to reply, your chances improve.

Do something or go somewhere unusual. If you say, "This is NT0Z, overhead in the Goodyear blimp, listening," you're bound to get a reply.

Whatever you do, don't wait around for others to come to you. Get after them yourself - and don't take silence for an answer! If you're a newcomer, you may have to be persistent until you make a few friends and put yourself on the repeater map! ■

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

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

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

Monitor Morse code from hams, military, commercial, aeronautical, diplomatic, maritime

Super Active Antenna

"World Radio TV Handbook" says MFJ-1024 is a "first-rate easy-to-operate active antenna... quiet... excellent dynamic range... good gain... low noise... broad frequency coverage."

Mount it outdoors away from electrical noise for maximum signal, minimum noise. Covers 50 KHz-30 MHz.

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

Switch two receivers and auxiliary or active antenna. MFJ-1024 \$139⁹⁵ 6x3x5 inches. Remote has 54 inch whip, 50 feet coax. 3x2x4 inches. 12 VDC or 110 VAC with MFJ-1312, \$14.95.

Indoor Active Antenna

Rival outside long wires with this *tuned* indoor active antenna.

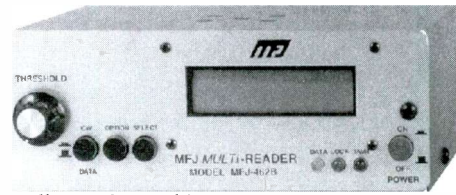
"World Radio TV Handbook" says MFJ-1020B is a "fine value... fair price... best offering to date... performs very well indeed."

Tuned circuitry minimizes intermod, improves selectivity, reduces noise outside tuned band. Use as a preselector with external antenna. Covers 0.3-30 MHz. Tune, Band, Gain, On/Off/Bypass Controls. Detachable telescoping whip. 5x2x6 in. Use 9 volt battery, 9-18 VDC or 110 VAC with MFJ-1312, \$14.95.

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-- all over the world -- Australia, Russia, Japan, etc. MFJ-462B **\$179⁹⁵**
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You can save several pages of text in an 8K of memory for re-reading or later review.

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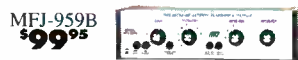
Eliminate power line noise!



MFJ-1026 \$179⁹⁵

New! 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.

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

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, \$14.95.

Dual Tunable Audio Filter



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High-Gain Preselector



High-gain, high-Q receiver preselector covers 1.8-54 MHz. Boost weak signals 10 times with low noise dual gate MOSFET. Reject out-of-band signals and images with high-Q tuned circuits. Push buttons let you select 2 antennas and 2 receivers. Dual coax and phono connectors. Use 9-18 VDC or 110 VAC with MFJ-1312, \$14.95.

CW, RTTY, ASCII Interface



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Super Passive Preselector



New! 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 loss. Air variable capacitor with vernier. 1.6-33 MHz.

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greatly improves copy on CW and other modes.

Easy to use, tune and read

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

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

It's easy to read -- the 2 line 16 character LCD display with contrast adjustment is mounted on a brushed aluminum front panel for easy reading.

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

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world band

tuning tips *your monthly international radio map*

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

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

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0000	17615	BBC relay, Thailand		0230	4781	Radio Oriental, Ecuador	SS
0000	17675	Radio New Zealand Int'l		0245	5010	HRMI, Honduras	SS
0000	17705	Radio Havana Cuba	SS	0300	6265	Zambia Broadcasting Service	
0000	21615	Radio Australia, via Northern Marianas	unid	0300	12005	RTT Tunisienne, Tunisia	AA
0000	17765	Voice of America relay, Philippines		0300	11655	Voice of Turkey	
0000	17550	China National Radio	CC	0300	7240	Trans World Radio, Swaziland	
0030	17860	Voice of Germany relay, Sri Lanka	GG	0300	9960	Norwegian domestic service	NN
0030	17790	BBC relay, Singapore		0300	7475	Voice of Greece	Greek
0030	4717	Radio Yura, Bolivia	SS	0300	9925	Voice of Croatia, via Germany	EE/Croat
0100	15295	Radio Free Europe/Radio Liberty, via Thailand	unid	0300	11925	Radio Bandeirantes, Brazil	PP
0100	13700	RDP Int'l, Portugal	PP	0300	11710	Adventist World Radio via Austria	unid
0100	6536	Radiodifusora Huancabamba, Peru	SS	0300	9970	RTBF, Belgium"	FF
0100	11955	BBC relay, Oman		0300	3360	La Voz de Nahuala, Guatemala	SS
0100	15315	Radio Netherlands relay, Bonaire		0300	4830	Radio Tachira, Venezuela	SS
0100	13580	Kol Israel	HH	0300	9885	Voice of America relay, Botswana	
0100	3310	Radio Mosoj Chaski, Bolivia	SS	0330	12040	Radio Ukraine Int'l	
0100	15330	Radio Marti, USA	SS	0330	13675	UAE Radio Dubai, United Arab Emirates	
0100	13670	Radio Canada Int'l		0330	7305	Vatican Radio	SS
0100	4995	Radio Brazil Central	PP	0330	9490	Radio Sweden	
0100	9440	Radio Slovakia Int'l, Slovak Republic		0330	3350	Radio Exterior de Espana relay, Costa Rica"	SS
0130	4980	Ecos del Torbes, Venezuela		0330	7290	Voice of America relay, Sao Tome	
0130	5637	Radio Peru, Lima	SS	0330	15420	BBC relay, Seychelles Islands	
0130	9870	Radio Austria Int'l		0330	7275	Voice of America relay, Morocco	
0130	11635	Radio Denmark, via Norway	DD	0330	15325	Radio Japan/NHK	JJ
0130	4915	Radio Anhanguera, Brazil	PP	0330	10320	Armed Forces Network, Hawaii	USB
0130	9737	Radio Nacional, Paraguay	SS	0330	3250	Radio Luz y Vida, Honduras	SS
0130	4832	Radio Litoral, Honduras	SS	0330	7310	Voice of the People, clandestine to Zimbabwe	
0130	5700	Radio Frecuencia San Ignacio, Peru	SS	0330	12035	BBC relay, Cyprus"	
0145	9605	Vatican Radio	SS	0330	4950	Radio Nacional, Angola	pp
0200	15425	Sri Lanka Broadcasting Corporation		0400	7120	BBC via South Africa	
0200	5010	Radio Pueblo, Dominican Republic	SS	0400	6185	Radio Educacion, Mexico	SS
0200	15495	Radio Kuwait	AA	0400	3300	Radio Cultural, Guatemala	SS/EE
0200	6973	Galei Zahal, Israel	HH	0400	11900	Radio Bulgaria	
0200	4819	La Voz Evangelica, Honduras		0400	4920	Radio Quito, Ecuador	SS
0200	4800	Radio Buenas Nuevas, Guatemala	SS	0500	7255	Voice of Nigeria	
0200	11710	Radiodifusora Argentina al Exterior		0500	15340	Radio New Zealand Int'l	
0200	6215	Radio Maranatha, Australia	SS	0530	6010	Radio Mil, Mexico	SS
0200	3290	Voice of Guyana		0600	15215	Channel Africa, South Africa	
0200	11787	Rep. of Iraq Radio	AA	0600	4915	Ghana Broadcasting Corp.	
0200	5010	Radio Cristal Int'l, Dominican Republic	SS	0600	4760	ELWA, Liberia	
0230	11940	Radio Romania Int'l		0630	6137.8	Radio Unamsil, Sierra Leone	
0230	12025	Radio Rossii, Russia	RR	0630	6100	Radio Liberia Int'l	
0230	11620	All India Radio					

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0630	9550	Radio Okapi, Congo		1500	9660	Radio Veritas Asia, Philippines	RR
0630	7120	Italian Radio Relay Service		1500	12010	Radio Marya, Russia	Polish
0630	7125	RTV Guineene, Guinea	FF	1500	17735	RTT Tunisienne, Tunisia	AA
0700	4835	RTV Malienne, Mali	FF	1530	13765	Vatican Radio	
0700	4975	Radio del Pacifico, Peru	SS	1530	15195	Adventist World Radio, Guam	Hindi
0700	5025	Radio Rebelde, Cuba	SS	1600	11570	Radio Pakistan	
0700	5975	Voice of Hope, via Germany		1600	11710	Voice of Korea, North Korea	FF
0700	5985	Radio Vlaanderen Int'l, Belgium, via Germany		1600	11735	Voice of Korea, North Korea	
0700	7460	Radio Nacional de la RASD, (clandestine)	AA	1600	17605	Radio France Int'l	
0700	11745	Voz Cristiana, Chile	SS	1600	11625	Far East Broadcasting Assn., Seychelles	
0730	15605	Radio France Int'l		1730	13580	Radio Sweden	
0800	5995	Radio Australia		1800	17615	RDP Int'l, Portugal	PP
0830	11565	KWHR, Hawaii		1800	15265	Radio Africa Int'l, via Germany	
0830	11765	KNLS, Alaska		1800	17830	BBC relay, Ascension Is.	
0900	6070	CFRX, Canada		1830	21590	Radio Netherlands relay, Bonaire	
0930	3290	Radio Centro, Ecuador	SS	1830	17780	RAI Int'l, Italy	II
1000	9840	Voice of Vietnam		1830	11734	Radio Tanzania, Zanzibar	Swahili
1000	13670	Radio Korea Int'l, South Korea		1900	15390	Deutsche Welle relay, Rwanda	
1000	5020	Solomon Islands Broadcasting Corp.		1900	15190	Radio Pilipinas, Philippines	
1000	11840	Voice of Russia via Sakhalin Is.		1900	15410	Voice of America relay, Morocco	
1000	12015	Voice of Mongolia		1900	12060	Voice of the Mediterranean, Malta, via Russia	
1000	11880	Radio Australia		1900	15640	Kol Israel	
1000	9645	TIFC, Costa Rica		1900	12125	Jakada Radio (to Nigeria)	
1015	4876	La Cruz del Sur, Bolivia	SS	1930	11690	Voice of Islamic Republic of Iran	
1030	5070	Emerald Radio via WWCR		1930	13690	Radio Vlaanderen Int'l, via England	
1030	6160	CKZU, Canada		2000	12085	Radio Damascus, Syria	
1100	3481	Voice of Ntl Salvation, (Korean clandestine)	KK	2000	15120	Voice of Nigeria	
1100	4890	NBC, Papua New Guinea		2000	15150	Voice of Indonesia	
1100	2310	ABC Northern Territory Service, Australia"		2000	12015	Radio Canada Int'l via UAE	
1100	3260	Radio Madang, Papua New Guinea		2030	11905	Radio Tashkent, Uzbekistan	
1100	3325	Radio Maya, Guatemala	SS	2030	15510	Radio Free Asia, via Northern Marianas	unid
1130	12130	Adventist World Radio, Guam		2100	13610	Radio Damascus, Syria	
1130	7385	Xinjiang Peoples BC Station, China	CC	2100	17660	HCJB, Ecuador	
1130	4925	Radio Republik Indonesia, Jambi	II	2130	17825	Radio Japan/NHK	
1200	10330	All India Radio		2130	9990	Radio Cairo, Egypt	
1200	11770	Radio Mexico Int'l	SS	2200	12000	Voice of Turkey	
1200	11580	KFBS, Saipan, Northern Marianas	CC	2200	15600	Radio Taipei Int'l, via WYFR	
1200	15585	Voice of Islamic Republic of Iran	AA	2200	9550	Broadcasting Svc of Kingdom of Saudi Arabia	AA
1200	11675	Radio New Zealand Int'l		2200	11905	Swiss Radio Int'l, via French Guiana	FF
1200	17670	YLE Radio Finland	Finnish	2200	9590	Radio Canada Int'l	
1200	6937	Yunan Peoples BC Station, China	CC	2230	15175	Radio Free Asia, via Sri Lanka	unid
1230	13765	Radio Sweden	Swedish	2230	11800	RAI Int'l, Italy	SS
1230	9525	Voice of Indonesia		2230	9875	Radio Vilnius, Lithuania	unid
1230	13775	Christian Voice, Australia		2230	15455	Radio Budapest, Hungary	SS
1230	7280	Trans World Radio, Monaco		2230	15345	Radio Nacional, Argentina	SS
1300	6150	Radio Singapore Int'l		2230	11600	Radio Prague, Czech Republic	
1330	15295	Voice of Russia		2300	9570	Radio Romania Int'l	
1330	15110	Radio Kuwait	AA	2300	11975	China Radio Int'l, via Mali	CC
1330	6130	Lao National Radio, Laos		2300	9900	Radio Cairo, Egypt	
1400	17895	Broadcasting Svc of Kingdom of Saudi Arabia	AA	2300	17815	Radio Cultura, Brazil	PP
1400	15345	RTV Marocaine, Morocco	AA	2300	9400	Radio Bulgaria	
1430	17730	Deutsche Welle, Germany via Antigu	GG	2300	6010	Radio Inconfidencia, Brazil	PP
1430	15210	China Radio Int'l		2300	9630	Radio Aparecida, Brazil	PP
1500	17770	Channel Africa, South Africa		2330	21790	Voice of Germany, via Russia	
1500	15145	BBC relay, Cyprus	RR	2330	17810	Radio Japan/NHK	SS
1500	7295	Radio Four/Radio Malaysia		2330	12110	Voice of Greece	Greek
1500	11690	Radio Jordan		2330	5030	RTV Burkina, Burkina Faso	FF
				2330	21740	Radio Australia	
				2330	9435	Radio Prague, Czech Republic	

radios & high-tech gear

review of new, interesting and useful products

New World Radio TV Handbook

We've received the brand new 2002 edition of the WRTH and it's certainly new and improved. Publisher Nicholas Hardyman said he has "responded to the justified criticism of the last few editions by taking over responsibility of the National Radio section of the book." With dedicated country contributors and a more timely updating process, we'd say the new edition is certainly an improvement! Included is hourly broadcast guides and much more — cover-to-cover it's 675+ pages of everything radio, including maps and receiver reviews!

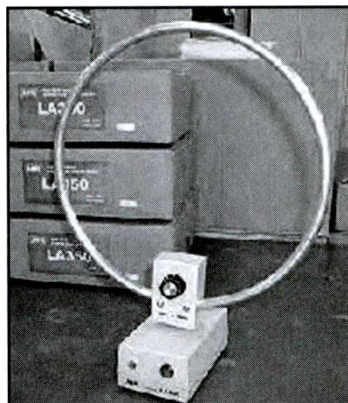
While the new 2002 WRTH to be a vast improvement and very up to date.

Hardyman is aware of the missing SW domestic frequencies in the SW frequency list in the new 2002 book and will be making that information available as soon as possible. In response to criticism as to why the domestic and international broadcasts in the WRTH are separated he said, "In order to get the book out in December (so that you get it while the information is current), we have to get as many pages as we can ready in advance so that they can be printed before the international SW information is ready. We then get the SW information as quickly as we can and the rest of the book is printed, and the whole thing is bound, boxed and distributed in two weeks. It would not be possible to get copies around the world in time if we put the two sections together." He continued, "... we produce the SW section on a database. We have to do this to produce the frequency and language listings. It would be a very long job to re-integrate the SW country information from the database output into the National listing and we would not get the book out until January or February, by which time there is only a short time to run on the winter schedules."

The World Radio TV Handbook is available from your favorite radio dealer. It's something every serious hobbyist should have near the shortwave receiver as a quick desk reference.

LA350 Active Loop Antenna From AOR

The LA350 is a new shortwave desktop active loop antenna. It's supplied with two interchangeable antenna elements as standard covering 3.0 to 9.0 MHz and 9.0 to 30 MHz loop (12 inch diameter). The LA350 has a tuning control to peak performance and elements may be rotated to enhance reception and null unwanted interference. It has a built-in high gain (13.5 dB) signal amplifier and has a high



The LA350 Loop from AOR has a suggested retail price of \$317.

IP3 (+30 dBm). The LA350 is ideal for traveling. Two additional bar antenna elements are available as options to further extend the operational frequency range.

Under development is an optional element covering 200 to 540 kHz, and 540 to 1600 kHz. Standard accessories include the 350S element, 350H element, AC adaptor, instruction manual, and 20 inches of coax with BNC connector. Suggested retail of the new LA350 is \$317. For more information contact AOR USA, Inc. at 20655 S. Western Avenue, Suite 112, Torrance, CA 90511 or phone 310-787-8615 or visit them on the web at www.aorusa.com.

MFJ's New DX Beacon Monitor - For Hams And SWLs!

Innovation and quality products that radio enthusiasts the world over have come to know and trust is the hallmark of MFJ Enterprises. Their innovation shines once again with the release of the MFJ DX Beacon. This unique station accessory gives you up-to-the-minute worldwide DX band conditions in just minutes on the 14, 18, 21, 24 and 28 MHz bands using the International Beacon Network of 18 beacons throughout the world.

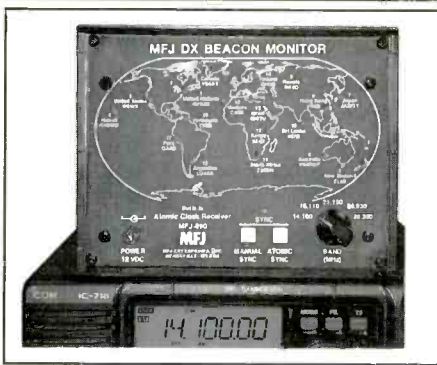
You'll instantly see which beacon you're hearing on your transceiver; an LED lights up on the DX Beacon world map to show you the beacon location and where to point your antenna. It's fascinating to hear and watch each beacon location light up as they become active across the world. It's great for DXers, contesters and SWLs!

The International Beacon Network provides a reliable source of signals for determining HF propagation 24-hours-a-day. Each one transmits on 14.1, 18.11, 21.150, 24.93 and 28.2 MHz. The transmit sequence moves westward from New York across North America, Asia, the Pacific to Africa, Europe and South America.

On each frequency, each beacon transmits for 10 seconds; its callsign at 22 wpm CW and a one-second dash at 100 watts and three one-second dashes at 10, 1, 0.1 watts. When each beacon completes a transmission it goes silent on that band and switches to the next higher band.

Tune to a beacon frequency. If band conditions are good, you'll hear each beacon identifying in Morse Code and four dashes each at a lower power level. The more beacons you hear, the more open the band is to different parts of the world. The more dashes you hear per beacon, the better the quality of propagation and the more robust the band is at that time. If you hear the 100 milliwatt dashes from many beacons you know the band is wide open! In just three minutes you'll know how band conditions are worldwide.

By storing the beacon frequencies in your radio's memory you can quickly check all five bands to see which one has the best propagation to a particular part of the world. You don't have to copy CW at 22 WPM to ID a beacon. When you hear it, an LED instantly lights up on a world map to show you its location. You can positively ID each beacon, even if the signal is weak, and the CW is fluttery or distorted.



The transmit sequence of the beacons are precision timed using GPS (Global Positioning Satellites). The MFJ DX Beacon Monitor duplicates this precision timing sequence. A microprocessor and a built-in WWVB atomic clock receiver maintains ultra precise timing. It's a self-contained standalone unit and requires no connection to your radio. It measures (HWD) 5.25" x 6.75" x 3" and uses 12 Vdc or 110 Vac with the optional MFJ-1315, \$14.95.

The MFJ DX Beacon sells for \$99.95 and is available from MFJ Enterprises, Inc., 300 Industrial Park Road, Starkville, MS 39759, phone (orders) 800-647-1800 or visit them on the web at www.mfjenterprises.com. Be sure to tell MFJ

Enterprises you read about the DX Beacon in *Popular Communications*.

B+K Precision Introduces Convenient, Economical Power Supply Accessory Kit

B+K Precision Corporation, one of the industry's leading suppliers of test and measurement products announces Model TLPS Power Supply Accessory Kit. The new kit, priced at \$39.95, combines safety and functionality with convenience and economy. It provides an initial selection



of accessories commonly used with most popular power supplies, eliminating the need to shop around for needed accessories when getting started.

"We assembled this kit with the user's safety in mind," said Bill Hansen, Director of Engineering for B+K Precision Corporation. "All materials meet or exceed the latest international safety standards. Every component was carefully selected for quality, reliability and longevity."

The new kit incorporates highly flexible silicone-jacketed test leads that utilize a retractile sheathed banana plug to connect to the power supply and a fixed sheath banana plug to protect the user. A majority of the items contained in the new kit meet international safety specs to 1,000 volts. The kit includes a complete selection of accessories including large, fully-insulated alligator clips, standard alligator clips, spade lug and banana plug adapters, and a ready-made lead set for power supplies with remote sensing capabilities.

For more information, contact B+K Precision at 22820 Savi Ranch Parkway, Yorba Linda, California 92887, phone 714-237-9220 or on the web at www.bkprecision.com.

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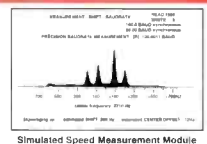
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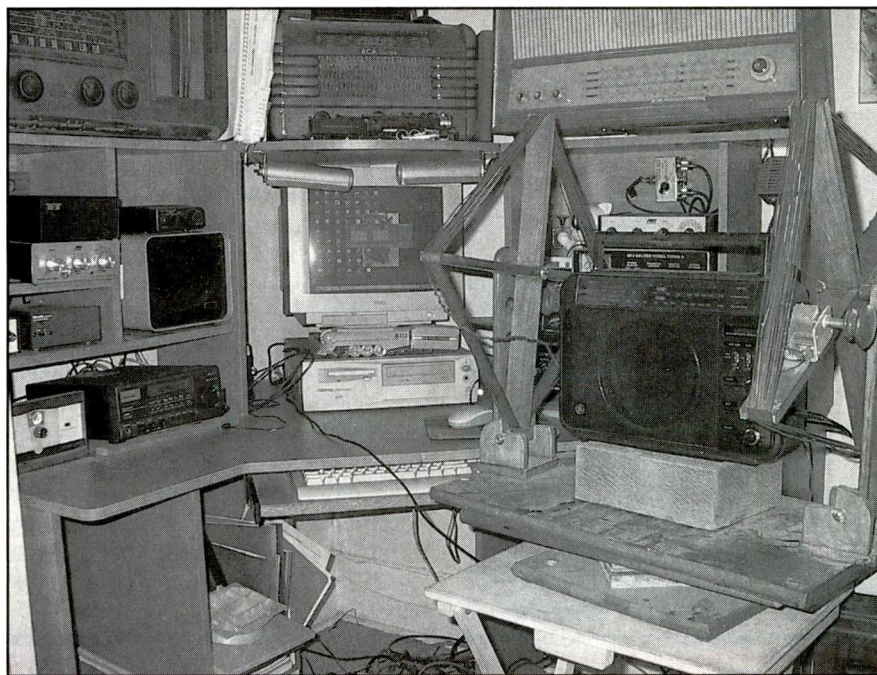
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computer assisted radio monitoring

by Joe Cooper <joe@provcomm.net>

DSP Applications – Part I



Here is the project. This is the GE Super Radio III on a Lazy Susan for easy turning so you can point it toward the station you want to monitor, plus a pair of passive loops for peaking the ferrite rod antenna in the radio. In the background you have the DSP software running on the computer. The processed sound will come out of the computer's speakers (not shown in the picture). You don't need to have the fancy open loops, but the Lazy Susan is a must for good BCB DXing.

vide you with every last bit of information, you will need to know in the space provided here, I'm going to be pointing you toward a number of good sources of information to help you continue on your own.

So starting this month, I am going to begin a two-part column looking at PC based digital signal processing (DSP). I will do this by showing you how to digitally reduce noise and interference in the audio output of Broadcast Band (BCB) radio with inexpensive or free software that controls a SoundBlaster compatible sound card to process the sound. The benefit of this application of DSP technology is to allow you to hear distant stations with greater ease.

The same techniques that I will be outlining for Broadcast Band radio DXing can also be applied to other types of radio monitoring, such as longwave, shortwave or scanning. However, because each of these types of radio monitoring has their own particular noise and interference problems, I will look at them separately in future columns.

So let's get started on this project by looking at how to start it up properly so that it will have a successful conclusion. As with anything, that is accomplished by good planning and design, and by having a clear goal towards which you are working.

Now that I've covered all of the very necessary background information that you need in order to understand how serial ports and soundcards operate, it's time to start applying our knowledge to practical use. Beginning with this column, and continuing for five more after this, I'm going to be looking at three major topics that are of concern to all those who wish to use their personal computers for effective radio monitoring.

The topics that are going to be covered will be (in order of appearance);

- Digital Signal Processing (DSP) using a SoundBlaster® compatible soundcard
- Direct software control of compatible monitoring radios
- Software based radio-monitoring logs

It is my hope that by the end of the six columns you will be able to make some good decisions about setting up your own computer assisted radio monitoring station based on your particular monitoring needs. The examples that I will be providing will serve as good starting models. As it is impossible to pro-

Background To The DSP Project

The starting point of any successful technology-based project is with a clearly defined goal or mission statement. President John F. Kennedy made one of the most famous examples of such a mission statement in 1961, when he said:

"I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to Earth."

That simple, but clear statement became the foundation for the \$25 billion dollar Apollo moon-landing program. While the words themselves are deceptively simple, they actually provided such a clear guideline that it ensured the success of the program by keeping the goal clear and manageable. Again, the real genius of what was said lays in its simplicity, and that should be remembered whenever you undertake your own project – keep it simple and achievable, even if it is something as complex as a moon landing.

Your own radio-monitoring project will not be as complicat-

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ed as a moon landing, but if you allow it to get out of control you may find yourself facing unnecessary problems and frustrations. Worse, you may end up with something that simply does not work due to the fact that some aspect was overlooked or improperly installed.

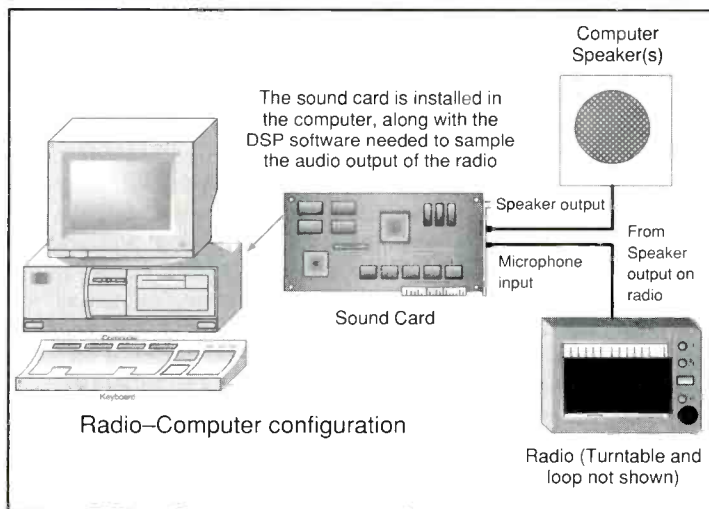
Good planning and design not only help you to prevent problems from happening, but when something does go wrong you can re-trace your steps so that you can fix it. So let's get down to the actual steps that are involved in the project plan in order to see what is involved.

Starting The Design

The starting point for any technology is to understand what specific problem we hope to solve by using it. For example, radio was designed to help people communicate without having to use wires. Personal computers were designed to run inexpensive and easy to operate software programs. Computer sound cards were designed to sample audio signals so that people could either store the results to a computer file for later use or to process the sound signal in a way specified by the computer user.

We know that there are many different technological components that are available for our use, and that we could spend many hours simply "playing" with them. The problem with that approach is that we would get various results, but none of them are predictable. The way to gain control over our project is to set a goal or mission for us to accomplish and then look for the right tools to help us achieve our aims.

In order to keep the technical issues in this project simple, monitoring the AM Broadcast Band was chosen. This is due to the fact that only one mode of transmission (Amplitude



Modulation) is being monitored in a well defined range of frequencies (530 to 1710 KHz). Likewise, the radio itself that is to be used is also straightforward, having only tuning, sound volume and tone controls to be concerned about.

Despite this simplicity, Broadcast Band DX listening is far from easy. This is due to the fact that the mediumwave band where AM radio is broadcast, is crowded with many stations, is prone to noise, and has some unique signal propagation characteristics that make the monitoring of distant or low power stations challenging.

The radio that has been chosen for the project also follows the ideal of keeping things simple. That radio is the GE Super Radio III, which provides an excellent design for listening to

distant stations, and has an affordable price. As a result, this particular radio has been the choice of many BCB DXers since its introduction in 1993.

The overall aim in using this particular radio is to tune in low and medium powered AM radio stations by picking up "skip" signals - those are signals that are "skipped" like a stone off of the E layer of the ionosphere during the nighttime when radio propagation permits this phenomenon. The problem with such skipped signals is that many other stations that are normally not heard on one frequency may be heard at the same time.

Another reception problem that is common with BCB DXing is the radio noise created by power equipment: florescent lights power lines, medical equipment, and so on. This noise can be on specific frequencies or it can blanket the entire band if it is strong enough. Whatever the cause, it can often be a major impediment to hearing weak or distant stations, particularly in urban areas where many sources of electrical noise can be found.

In the past, the primary way that the problems of selectivity (separating stations near to each other) and noise reduction were undertaken was through mechanical or electrical filters working dedicated circuits. While that approach was useful (and necessary) for decades, there were some limitations - the primary one being the high cost of producing a quality filter or circuit.

With the advent of inexpensive solid-state processors and computing devices that came about during the 1980s and '90s a revolution in Digital Signal Processing took place. Stand-alone devices, which contained a small computer and built-in software, were used to process the audio signals that came out of a receiver. These were initially expensive, but they provided a wide range of filter and processing settings making the investment worthwhile.

It was with the advent of the inexpensive high-speed Pentium-based computers during the mid to late 1990's in conjunction with the availability of the SoundBlaster compatible sound card that things really began to take off for the use of DSP technology with radio monitoring. Radio hobbyists with computer programming skills began to explore the possibilities of using their home computers to process audio signals from their receivers and found that it was a relatively easy thing to do.

From those efforts a number of software programs that would turn a SoundBlaster card into an affordable DSP processor for radio monitoring applications became available. Many of these programs are available for downloading from the Internet, and most of them are free of charge. Each program has its own special characteristics and features, which are designed around a particular way in which an audio signal can be processed.

So the question then is which DSP software program is the best one to overcome the problems of noise and interference that are encountered when doing BCB DXing?

Reviewing DSP Software

There are many different DSP software packages available on the Internet and commercially, but after having tested several, I have chosen to review two here. These will be the ones that will be used in our BCB monitoring station (after all, there is nothing saying that you cannot use more than one) and which will be used to illustrate how to process an audio signal.

The reason I have chosen these two is because they are easy to use, work properly and are free of charge. They are:

- DSPFIL by Michael Keller, DL6IAK (<http://www.qsl.net/dl6iak/projects/dspfilter.htm>)

- DSP SWL by Bernhard Reiser (<http://www.wh2.tu-dresden.de/~bernd109/amateurfunk/amateur.html>)

Each of the programs is designed specifically for radio monitoring use. They have effective frequency range coverage of between 0-4000 Hz and support "on-the-fly" changes to the amount of filtering available at any given time. This approach is superior to other types of DSP software that lock into one pre-defined filtering characteristic or require that you build a series of pre-defined filters types that you select and hope will work.

For the effective use of DSP in radio monitoring you need to be able to adapt to the signal and atmospheric/noise conditions you find. Again, the two software programs chosen here allow you to change the filtering/noise reduction characteristics of the DSP device (e.g. your soundcard) to produce the audio output that meets your radio monitoring needs.

While the two software programs share the same flexibility, they are significantly different in their design and application. DSPFIL is the simpler of the two, but allows the greatest flexibility as you listen to a particular frequency. DSP SWL requires that you set up pre-defined filters, but it also contains noise filtering and an on-the-screen view of input/output audio signals.

Simply then, you can use DSPFIL for casual listening where you simply want to zero in on station that may be located near another stronger station or noise. DSP SWL is better suited for "digging" a weak signal out of the background noise, or where there is a greater amount of electrical interference in the local area.

The key point to remember in either case is that DSP software is only good at processing what the radio has already received. If reception conditions are poor, if the monitoring radio has poor sensitivity/selectivity characteristics, and if there is too much electrical interference, then the DSP software cannot perform a miracle and bring in distant stations clear as a bell. On the other hand, if a signal is present then the proper application of DSP technology can make the difference between hearing and not hearing a distant station.

In the next column I will go over the actual set up and operation of each of the software packages in more detail, looking at their application in the "real-world" monitoring of BCB DX stations. What will be important to understand is that once you introduce DSP technology into your monitoring system, the techniques that you use to monitor change significantly.

If you do not adjust to this change, then you will find that DSP technology works against you, rather than assisting you. Strategies for this change will be outlined at that time.

Designing The Monitoring System

The main design strategy for our DSP based BCB monitoring station is to take the audio output from the radio receiver and pass it through the sound card in the personal computer you are using. Once the sound card, through the use of the DSP software, has processed the sound, you will hear the results through either the computer speakers or headphones attached to the sound card.

While this set up is relatively simple, there are several things that you will need to consider in order to have a successful monitoring station. For example, the proximity of the radio to the computer could result in radio hash from either the computer monitor or the CPU being picked up by the radio, resulting in a lot of unnecessary background noise. The position of

the computer speakers must also be comfortable and useful for hearing weak or distant stations.

The key point here is to look carefully at the way in which you have your equipment set up in order to be able to reach each component comfortably. Nothing ruins the pleasure of radio monitoring more quickly than frustration and aggravation, so don't inadvertently build these unnecessary things into your design.

The starting point for the basic BCB monitoring station being put together here came from an article that I did for Popular Communications in the April 1998 issue called "Tuning Up Your Broadcast Band Monitoring Station". (Note: you can see this article on my personal web page at <http://www.prov-comm.net/pages/joe>, or by purchasing the back issue at \$4 each (postpaid) from Pop'Comm at 25 Newbridge Road, Hicksville, NY 11801.

The basis for the station was the GE Super Radio III mentioned before, which was placed onto a Lazy Susan to allow it to be pointed in a particular direction in order to monitor stations found there. In order to increase the efficiency of the internal loop antenna built into the radio, a passive loop tuner is used to peak the Q of the ferrite coil. By pointing the radio at a weak station, then peaking the internal antennas performance, extremely good DX monitoring can be achieved.

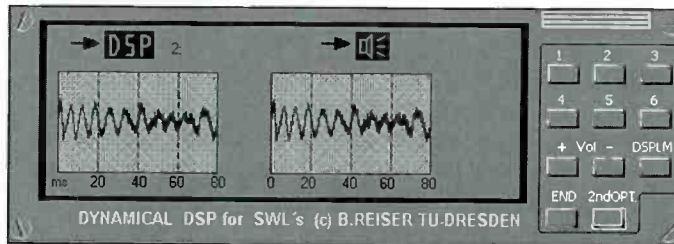
However, the GE Super Radio III only provides a wide/narrow signal filtering system. Likewise the analog tuning is not very sensitive or accurate when trying to dig out a weak signal. Here is where the DSP technology comes into use, for once you are able to find a particular frequency that has some significant signal activity you can then use the DSP software to isolate a particular portion of the signal heard through the use of programmable filters and noise reduction.

Remember that the radio suggested here is not the only one that you can use. Any good portable radio that receives BCB frequencies, contains a built-in ferrite loop antenna and has an audio output jack can be used in this project. The most critical part of those three features of the radio is the audio output jack, which I'll talk about next.

Setting Up The Station

The only part of this BCB DSP project (other than the radio, the Lazy Susan and the passive loop) that is important is to have a radio with an audio output jack.

Here is the DSP SWL software package. The screen allows you to view the input audio signal and the results after it has been processed. The keypad to the right allows you to select pre-defined filters for different monitoring situations. Likewise, you have access to the set-up and options of the programs through the 2ndOP button.



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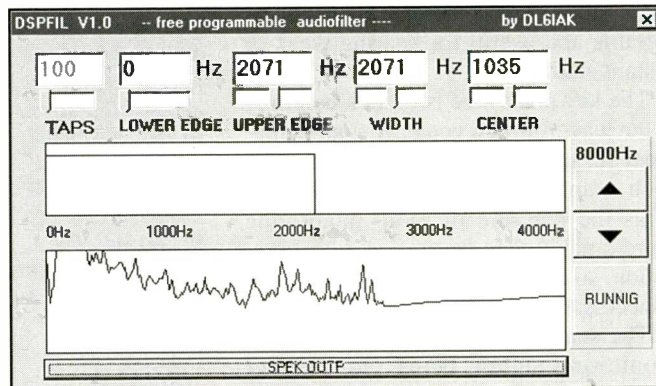
This is needed in order to connect the radio to the sound card in the computer. This connection is made with an audio cable of the appropriate length. The cable that you need is something in the order of 20 feet in length, having male mono jacks on each end. These cables can be purchased at most electronic supply stores for a reasonable price (however, don't waste your money on ones with fancy gold plated connections which are all the rage among audio fanatics).

First, after having downloaded the DSPFIL and DSP SWL software from the Internet, install them according to the instructions provided with them (be certain to read all of the operating instructions provided with them as well). Try operating the software, and learn how the controls work on each of them.

The reason why it is important to have a good understanding of your software is that once you begin using DSP technology it is going significantly change the way you use your monitoring radio. You will need to not only know how to operate your radio properly, but you will now have an additional set of tasks to perform when you are controlling the digital processing of your signals. I will provide detailed information on how to do this in the next column.

The actual hooking up of the monitoring radio to the sound card is fairly simple. However, it is strongly advised that even with a project such as this one that you make a list of steps that you are going to be doing and check each off as they are accomplished. This will come in handy later on if you have any problems and want to troubleshoot them.

Plug one of the audio cable jacks into the microphone jack of the sound card (not the line in) and the other into the earphone jack (or audio output) of the monitoring radio. Make certain that the computer speakers are plugged into the speaker output of the sound card and are operating (you can check



This is the DSPFIL (or DSP Filter) program in action. You can see how the processing cuts off the upper frequencies almost completely as shown by the flat line above a well defined point. You can adjust the characteristics of the filter on the fly by using your mouse pointer to change the frequency values with the sliders. Very narrow bandwidths in a very precise frequency range can be achieved.

this by performing one of the many functions in the computer that have a sound associated with it).

Before doing anything else, check to see if the DSP software is working properly. Start by turning on the DSP SWL software and going to the settings (click on the button labeled 2ndOPT on the software). Go to the options tab and make certain that the input method is Microphone. Turn on the radio and the computer speakers, and see if you hear any output from those speakers (you should hear no sound from the radio's speakers if the cable has been plugged in properly). If you can hear sound from the computer speakers you should also see the graphic display of the audio input and output on the software's display.

Once you are satisfied that everything is working properly, turn off the radio and the software and proceed to test DSP-FIL. Turn on that software, and then turn on the radio. Make certain that the software settings are set to "running" so that the program is actually processing sound. Try changing the display to show audio input and output to see the differences.

If things are not working as expected simply turn everything off and trace back your steps as if you were installing everything the first time. In general, if you have made a checklist, go back over it starting at the beginning and work your way through. Most often the problem will become apparent very quickly and you will be able to fix it with no problem.

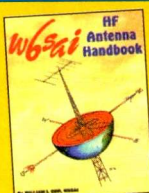
If it appears that everything is working properly then proceed to set up the radio in a place where you can reach it and the controls of the computer comfortably. You should be able to rotate the radio on the Lazy Susan and tune both the radio and the passive loop with out difficulty. Likewise when you hear a station that you want to use the DSP technology to process, you should be able to turn to the computer with ease.

The important task at this point is to gain confidence in using the software so that you understand its purpose in helping you to monitor difficult-to-hear radio stations. Again, DSP technology cannot process something that is not found in the audio signal; you still have to tune it in. What is important is how you use the programmable filters and noise reducers in order to dig those difficult to hear signals out of the noise and interference.

Next Month

Next month I will take you through the procedures required

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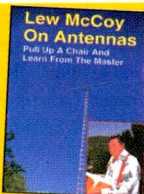
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by Lew McCoy, W1ICP

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by Jerry Sevick, W2FMI

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to properly use your DSP technology for BCB radio monitoring. What I will outline is the proper setup of the filters that are available through the software packages introduced here and the techniques required while monitoring in order to get the most use out of them.

What you will find out is that the use of a computer in radio monitoring is not transparent. It is another tool that must be learned and operated properly in order to get the most benefit from the technology. However, once you have achieved some measure of skill with the

computer it can make a significant difference between hearing and not hearing a DX station.

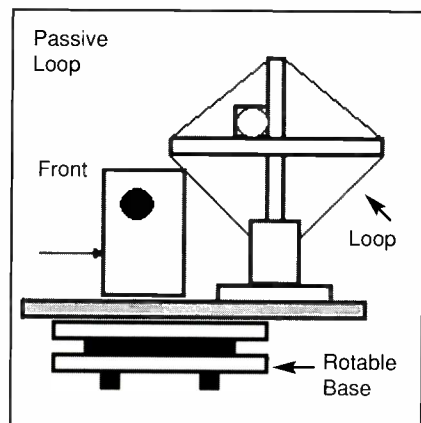
I will also discuss the application of the DSP software introduced here for use with shortwave, longwave and other monitoring tasks. The techniques used in those situations are different only in terms of the wider range of signals to be monitored.

Please continue to see along questions and comments to my email address, which is joe@provcomm.net. Likewise I would be very interested in hearing from people who have been

using their personal computers in ways that I have been describing here – particularly the many Mac users who indicated that they are out there.

Later on I am going to be looking at a wide range of software that can be used to demodulate a wide range of digital modes, such as CW, RTTY and FAX. Believe me, we are only just beginning this rather fascinating journey into the use of computer assisted radio monitoring. So until next month, enjoy experimenting with this new computer technology and have many successful radio monitoring sessions. ■

Making A Passive Loop Antenna For An AM Radio



This shows you the general configuration of the AM radio, the passive loop antenna that you will be building, and the Lazy Susan that it sits upon. The overall construction shown here is relative, so don't worry about size or dimensions. Work out what does the best job for your particular AM radio based on where it will be used.

The external loop is operated by placing it beside an AM radio that has a built-in ferrite antenna. You tune the radio to a particular frequency, then peak the signal that you hear by tuning the 365 pf tuning capacitor attached to the external loop.

When the capacitor is tuned it will create a magnetic field that is coupled to the ferrite loop. The amplification occurs due to the increase in the effectiveness that takes place in the radio's own antenna circuit when the loop is properly tuned.

Pointing the radio directly at the weak station increases the signal strength received by the AM radio's loop antenna. Using a Lazy Susan to rotate your radio makes the whole tuning process easier to manage. By having both the radio and the external loop placed on the Lazy Susan you will make your tuning process much easier when you are hunting for distant stations.

The loop antenna design uses a basic radio circuit made up of a capacitor and a loop of wire that is attached to it. These are held together with a form made out of two cross arms of wood. Approximately 65 feet of 22-gauge wire (roughly 16 turns) are wound around the cross arms, and then the two free ends of the wire are attached across a 365 pf tuning capacitor. This is done by soldering one end of the wire to the metal frame of the capacitor, and the other to the lug attached to one half of the tuning vanes.

The center tuning frequency of the loop is roughly 940 kHz, and will tune the entire broadcast band from top to bottom. An advantage of the design is that it is able to capture the groundwave of a broadcaster at an optimal angle for a maximum signal. The loop also has surprisingly good nulling capability, and can help reduce the signal of an interfering station. The loop design also works very well without a ground attached, and no particular advantage has been found when it has been used.

The parts for the loop antenna are as follows:

- 65 Feet (approx.) 22 Gauge Stranded Hookup wire
- 1 tuning knob*
- 1 360 pf variable capacitor
- 1 18" x 1.75" x .5"
- 2 8.5" x 1.75" x .5"
- 1 bottle of wood glue or epoxy

* Some people have found that wooden toy wheels that are available in many hobby and hardware stores make very inexpensive tuning knobs that perform just as well as the store bought kind.

To make the loop, simply glue the wooden parts into the form of a cross. You will want to glue the two shorter pieces onto the longer to do this. Remember that you want

to have a wide surface on each end of the cross so that you can wrap the wire 16 times around it. After giving the wood about 24 hours to dry, glue the 360 pf variable capacitor to one of the arms. You can hold the capacitor to the arm using rubber bands so that it will not fall off as the glue dries. After another 24 hours to ensure that the capacitor will stay on, wrap 16 turns of the wire around the arms of the crosspiece. You can use some glue on the ends of each crosspiece to secure the wire. Solder the ends of the wire to the capacitor, placing one on the base lug, and the other on the vane lug. Finally, place the tuning knob on the capacitor and then test.

To test the loop, place it beside your broadcast band radio that has a built-in ferrite antenna (not a telescoping type). Simply turn on the radio and tune in a station at the "low end" of the dial (around 550 kHz) and turn the capacitor rotator until you hear a change in the signal strength of the station heard. This will indicate that the loop is working at that frequency. You should then tune to a broadcast station in the "high" end of the band (above 1500 kHz) and tune the loop's capacitor again. You should have the same results.

If you do not find that any effect is taking place, check the wire, capacitor and solder joints to see if any problems can be found, then fix. Likewise use a different radio if one is available in order to see if the problem lies there.

The loop can be placed either beside or behind the radio when being used. Remember to give yourself enough room to be able to reach the tuning knob on the loops, capacitor as well as the controls on the radio itself. When you have tuned in a station on your radio try improving the signal by tuning the loop itself. You should hear an improvement in the signal, particularly if there is a strong station next to the frequency or some additional interference nearby.

New Mediumwave Antenna Tuner From Palstar

It's always exciting to learn about new products dedicated to AM broadcast DXing. The Palstar R30 communications receiver has become a favorite among mediumwave DXers, especially when outfitted with a Collins narrow filter, rated by many as providing the most bang for the buck among mid-priced receivers. Now Palstar has introduced a new antenna tuner specifically designed for mediumwave reception. The Palstar MW550P Mediumwave Tuner features high-Q tuning 518 - 1750 kHz and a low noise preamp. According to published data, the 3 dB bandwidth is adjustable to a narrow 2 kHz, important for separating DX signals from adjacent frequency interference. This might be just the tool for DXers in urban areas where strong local AM signals may interfere with DXing, or when a long wire antenna overloads a receiver and produces shortwave spurs. The MW550P will even handle input from a Beverage antenna, a good indication of bullet-proof signal handling capability. For more information visit the Palstar web site at www.palstarinc.com or visit our friends at Universal Radio via www.dxing.com.



The Palstar MW550P Mediumwave Antenna Tuner.

Broadcast DX Gatherings

Most broadcast DX clubs hold annual conventions to provide DXers an opportunity to meet and share experiences. Conventions often include tours of radio station studios and transmitter sites arranged by the convention hosts, along with technical presentations, a formal banquet and tourist activities. Here are two worth checking out.

The 2002 International Radio Club of America (IRCA) Convention will be held near Seattle, Washington on August 16-18, 2002. Bruce Portzer and Phil Bytheway will be your hosts. The site is the Towne and Country Suites, 14800 Interurban Ave S, Tukwila WA 98168. Reservations can be made by calling 800-545-2323 (please mention IRCA discount). Their web site is www.towneandcountrysuites.com. Room rates: \$69/night (single), \$83/night (double-triple). Registration will be \$30 (\$15 without banquet). Phil Bytheway, 9705 Mary Ave NW, Seattle, WA 98117-2334 will handle reservations (please make checks out to Phil Bytheway). Ship auction items to: Bruce Portzer, 6546 19th Ave NE, Seattle WA 98115. Questions, etc., contact Phil Bytheway (e-mail phil_tekno@yahoo.com). We look forward to seeing you here.

The 2002 National Radio Club and DX Audio Service (NRC/DXAS) Convention will take place Labor Day weekend August 30 through September 2 at the Hampton Inn of Lima, Ohio, hosted by Fred Vobbe, chief engineer of WLIO TV and managing editor of the DXAS. The hotel hospitality room will open at 12 noon August 30 for registration and serve as the focal point for all convention activities. The banquet will be held at The Old Barn Out Back, famous for their "Grandma's cookin'" buffet. Bus transportation between the convention

hotel and restaurant will be provided. Visit www.nrcdxas.org for more information.

QSL Information

Congratulations to John Bryant for an outstanding catch from the Grayland, Washington DXpedition! John reports, "Today the post office box had this lovely letter in it from RRI Sorong (909 kHz). The letter is so interesting that I thought you might enjoy it. Here is the text:

Dear Sir,

We say thank you very much for your letter, Mr. Professor John H. Bryant. We are very happy and glad to receive your letter in Sorong. You wrote in your letter that "none of these experiences was as thrilling as listening to RRI Sorong on 909 kHz mediumwave from the Pacific Coast of the state of Washington." I also reply your letter on the air. I called your name and read your letter.

About your reception report, that was right, because you are pleased to hear RRI Station Sorong and to catch my wave, I am going to tell you [about] the station of Radio Republic Indonesia Stasiun Sorong (RRI Station Sorong).

Transmitter: SW Harris BC 10 HT
Wave: 61,53 metres
Power: 10 kilowatt
Frequency: 4785 kHz
Antenna: Broadband Dipole - 18 metres

Transmitter: NEC.MET, 4080E, MW
Wave: 330 metres
Power: 10 kilowatt

Frequency: 909 kHz
Antenna: 80 metres

Transmitter: NEC FM 100 WIT
Power: 100 watt
Frequency: 96.7 MHz
Antenna: 40 metres

Well, that's all for now, Greetings from Station Manager and Staffs of RRI Station Sorong to all of you and I hope you send me some other reports in the future.

Yours Sincerely,
Station Manager
Umar Solle

"Very interesting letter. First, it appears to have been typed by Mr. Solle himself on a typewriter (not a printer) that needed cleaning. Secondly, Mr. Solle's English might be a bit rusty, but it is very good, under the circumstances. So, as long as he is station manager, there appears to be no need to send reports in Bahasa Indonesian. The postage on the letter was 9,500 Rupiyah, a huge amount (more than double the cost from a few years ago. The correct station address is: Radio Republic Indonesia Stasiun Sorong, Jl. Jend. A. Yani No. 44, Sorong 98414, Indonesia.

I sent an English-language report with \$2, an Indonesian-language report, an audio CD and several postcards of the Washington Coast. I also included copies of my QSL card and letter from RRI Sorong on shortwave which I received in the mid-1980s.

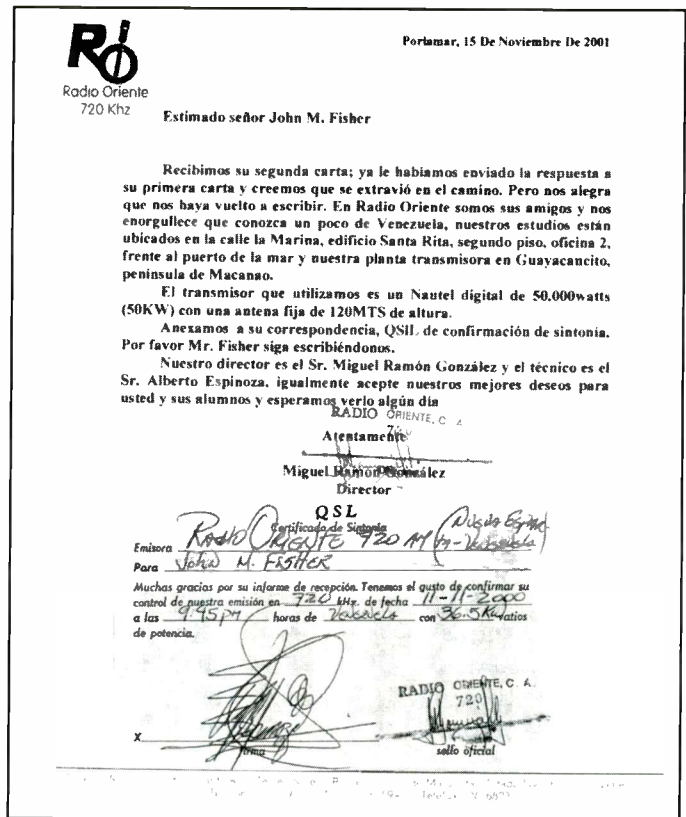
I'm really overjoyed with this QSL, to put it mildly. I specialized in Indonesian shortwave broadcasting for many years and even wrote two small books about it. This Spring 2002 reception of Sorong on 909 kHz from Grayland, WA was a real team effort between three or four of us on that DXpedition and was my first-ever reception of Indonesia on medium wave, after trying for a goodly number of years. I'll be sending Mr. Solle a very nice "thank you" letter and a small gift. It's things like this that keep me sending out reception reports, despite the declining response rates and escalating costs." (Bryant, WA)

QSL Information

650 CKOM Saskatoon, Saskatchewan, verification written on back of a scenic Saskatchewan postcard mailed in a Rawlco Radio Ltd envelope, in 140 days with apology for delay since station was moving, signed David M. Senft, VP Engineering. Address: 2401 Sask Drive, Suite #210, Regina, SK S4P 4H8. (Griffith, CO)

690 KTSM El Paso, Texas, letter on Clear Channel stationary plus sticker, station history one-sheet, program schedule, coverage map, and "Talk Guide" brochure with program highlights received in 15 days, signed Carol Perez-Vitier. \$1 sent with report was returned. Address: 4045 N Mesa St, El Paso TX 79902. (Griffith, CO)

1170 KFAQ Tulsa, Oklahoma, QSL letter on nice letterhead with a picture of the globe in 6 days, signed Michael DelGiorno-PD and Afternoon Host. Address: 4590 East 29th, Tulsa OK 74114. (Martin, OR)



John Fisher received this rare verification letter and QSL card from Radio Oriente 720 AM Venezuela.

1190 KPHN Kansas City, Missouri, received QSL, business card, and bumper stickers in 7 days, signed Andrew "Drew" Kloeppel, Controller/CFO. Address: 1212 Baltimore, Kansas City, MO 64105. (Martin, OR)

1220 KFSB Palo Alto, California, information letter and party cards in 96 days, signed "Bridge Staff." Address: 39138 Fremont Bl, 3rd Fl, Fremont, CA 94538. (Martin, OR)

1270 CHAT Medicine Hat, Alberta, a friendly QSL letter in 12 days, returned my \$1 stating the report was thanks enough, signed Dwaine Dietrich, GM. Address: 1111 Kingsway Ave SE, Box 1270, Medicine Hat, AB T1A 7H5. (Griffith, CO)

1610 KALT Atlanta, Texas, veri. letter on Dominion Media Corp stationary from attorney who previously represented KALT, for reception on December 9, 2000, received in 10 days after follow-up letter, signed S. Tyler Swain, Attorney. Address: 12200 NW Freeway, Ste 675, Houston, TX 77092. Thanks to Greg Myers (NRC) and Michael Procop (DX-midAmerica) for the address tip. (Griffith, CO)

1710 Chabad-Lubavitch Radio, Brooklyn, New York, verification letter and introduction to the Chabad-Lubavitch movement, in 197 days for report in NRC's DX News magazine. Address: Lubavitch World Headquarters, 770 Eastern Parkway, Brooklyn, NY 11213. (Conti, NH)

WTTM is interested in reception reports, here are the details from the CE; "I am Neal Newman the new Chief Engineer for

PENDING

New Call	Location	Freq.	Old Call
WYDE-FM	Cullman, AL	101.1	WRRS
WWLS-FM	Kingfisher, OK	105.3	KLGH
KWRC	Corpus Christi, TX	88.7	KFGG

New Call	Location	Freq.	Old Call
KFDN	Lakewood, CO	88.1	New
WKVH	Monticello, FL	91.9	New
WAPB	Madison, FL	91.7	New
WSGA	Hinesville, GA	104.7	WHVL
WAYT	Thomasville, GA	88.1	New
KTHI	Caldwell, ID	107.1	KCID-FM
KCHQ	Driggs, ID	102.1	New
WIBL	Shelbyville, KY	101.7	WTHQ
KBBX-FM	Nebraska City, NE	97.7	KQCH
KQCH	Omaha, NE	94.1	KMXM
WCOF	Arcade, NY	89.5	New
WHTR-FM	Corinth, NY	93.5	WHTR
WVOA-FM	Mexico, NY	103.9	WVOA
WUUF	Sodus, NY	103.5	WNNR-FM
KKBX	Fargo, ND	101.9	KFGO-FM
KFAB-FM	Kindred, ND	92.7	KULW
WRAU	South Webster, OH	94.9	WZIO
KOOZ	Myrtle Point, OR	94.1	KTBR-FM
WCWQ	Dallas, PA	93.7	WBSX
WOWQ	Du Bois, PA	102.1	WMOU-FM
WBSX	Hazleton, PA	97.9	WAOZ
WWLY	Huntingdon, PA	106.3	WWZB
WZET	Hormigueros, PR	92.1	WSMA
WSKO-FM	Wakefield-Peacedale, RI	99.7	WZRA
KFMH	Belle Fourche, SD	102.1	New
KRBE	Houston, TX	104.1	KRBE-FM
KHCJ	Jefferson, TX	91.9	New
KTEZ	Mount Enterprise, TX	99.9	KGRI
KJR-FM	Seattle, WA	95.7	KBTB
WPWV	Princeton, WV	90.1	New
KLWV	Chugwater, WY	90.9	New

CHANGES

New Call	Location	Freq.	Old Call
WKEN	Dover, DE	1600	WNRK
WPNN	Pensacola, FL	790	WSWL
KKHK	Kansas City, KS	1250	KWSJ
KHLP	Omaha, NE	1420	KBBX
WHTR	Albany, NY	1400	WABY
WVOA	DeWitt, NY	720	New
WLKR	Norwalk, OH	1510	WVAC
KPGM	Pawhuska, OK	1500	KOMH
KFAQ	Tulsa, OK	1170	KVOO
WMQM	Milan, TN	1600	WKBJ
KITT	Parowan, UT	1400	KZEZ
CKJH	Melfort, SK	750	CJVR
KDBZ	Anchorage, AK	102.1	KKRO
KLFS	Van Buren, AR	90.3	New
KPTI	Alameda, CA	92.7	KXJO
KEKL	East Sonora, CA	89.5	New
KPRI	Encinitas, CA	102.1	KXST
KKDV	San Francisco, CA	95.7	KZQZ
KJAT	Yermo, CA	105.3	KYHT
KQMT	Denver, CO	99.5	KKHK

WTTM 1680 AM in Princeton, NJ. I am also Amateur Radio Station KA2CAF. I have always enjoyed QSLing and DX listening since I was a kid. Now I have the opportunity to QSL from a really nice station. My friend Mick, who works for Nassau Broadcasting, was the Chief Engineer for WTTM until the company I work for bought the station. Mick had shown me his collection of cards and letters from avid DX listeners. For QSL info send to the following: Multi-Cultural Broadcasting, EBC Radio, 456 Middlesex Avenue, Metuchen, NJ 08840. Thanks in advance."

Broadcast Loggings

Paul Walker checks in with a fantastic FM opening in Connecticut to Minnesota and South Dakota. Paul writes, "I was not the only person in my area to pick up these South Dakota and Minnesota stations, a friend of mine in Chicopee, Massachusetts was also able to receive them. I picked them up on a digital Aiwa boom box with 40 feet of speaker wire as an antenna. My friend used a Walkman in school." Let's hope the teacher wasn't too upset that your friend's attention was focused on DXing! All times are UTC.

650 WSM Nashville, Tennessee at 0310 a weak signal, good modulation, with The Whites performing "Swing Low Sweet Chariot," and Ricky Scaggs introducing The Kingstons performing their Celtic version of "Wabash Cannonball," then a final song and farewell from Scaggs. (Bauer, MD)

700 WLW Cincinnati, Ohio confirmation letter in 19 days, signed Gary Barnett, Engineer. Address: 1111 St Gregory Street, Cincinnati, OH 45202. (Bauer, MD)

700 WWTL Walkersville, Maryland at 1539 "When the Going Gets Tuff" by Billy Ocean, "Hungry Like the Wolf" by Duran Duran, and a song from the soundtrack City of Angels. (Bauer, MD)

740 CHWO Toronto, Ontario, after not hearing this station in 20 years when they were CBL, heard at 0600 with nostalgia format and lots of "Primetime Radio" IDs and 740 jingles. New under this call. (Martin, OR)

1590 WKHZ Ocean City, Maryland at 2207 Top 40 music, Nickleback "You Remind Me," then "All music KHZ" station ID followed by Sugar Ray "I Just Wanna Fly." (Bauer, MD)

96.5 KNWC-FM Sioux Falls, South Dakota at 1708, the DJ was giving the weather forecast followed by Christian music, "I Love You Lord." The surprising thing about this one is we have a 50 kW station at 96.5 only 30 miles away from here. (Walker, CT)

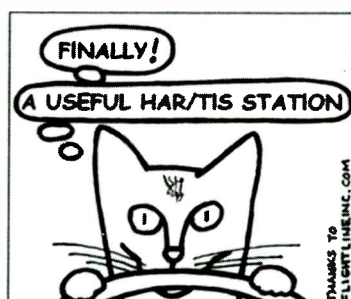
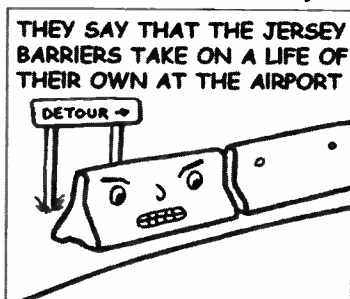
97.3 KMXC Sioux Falls, South Dakota at 1710, heard some adult contemporary music, sounded almost automated, but a DJ did come on, and in between songs there were mentions of "listen at work" and a song by Cheryl Crow. (Walker, CT)

97.3 KRZY-FM Starbuck, Minnesota at 1735 coming out of a song, I heard the DJ mention "The River," then a few minutes later I heard a jingle for "Central Minnesota Weather." (Walker, CT)

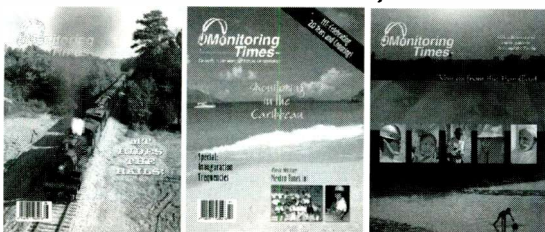
Feedback from Don Latham, Six Mile Systems / Lightning Forensics, Huson, Montana, regarding the purr-fect ground reinforced with Bentonite clumping clay cat litter (Pop'Comm, July 2002); "Read your ground description with interest. We used to use 1 by 1-foot lead squares about 1/4 inch thick with the corner pounded over a copper wire, some electrical tape or RTV to "seal" the pounded joint, buried at about 2 to 3-foot depth with Bentonite wetted below and above the plate. This will last a long time. By the way, if you put two of these about 1000 feet apart, fed with coax, and look at the resulting voltage between the electrodes, earth currents from the ionosphere will be apparent, and close thunderstorms will be fun lookin'."

Thanks to Norman Bauer, John Bryant, Phil Bytheway, Patrick Griffith, Patrick Martin, Neal Newman, and Paul Walker for their contributions this month. 73 and Good DX!

LOCO THE DX CAT by Bruce Conti



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Uncle Sam's New Middle East Radio Voice

The U.S. government has a new radio voice in operation. It's a special service for the Arab world called **Radio Sawa** also known as **MERN** – the **Middle East Radio Network**. The new service is active from 0400 – 0600 on **5965** (via Kavala), **7255** (via Morocco), **9680** (Kavala), **11670** (Kavala) and **15380** (Sri Lanka). Also 0730 – 0830 on **9660** (Wooferton), **9715** (Kavala), **9765** (Wooferton), **11820** (Wooferton), **11910**, **11995**, **15205** and **15355** (all Kavala). And from 1700 to 2100 on **6040** and **7105** (Kavala), 1800-2100 on **9505**, **11825** (Kavala), **15545** (Sri Lanka) and 2000-2100 on **6120**, **9620** and **11895** (all Kavala). Apparently there have been some cutbacks in the Radio Free Iraq service (and perhaps others) in order to accommodate the new Arab language service.

Another new broadcaster is **Jakada Radio International** whose broadcasts favor mostly an African audience. Initial transmissions, believed to be from a site in Russia, are happening on **12125** at 1900-1930 on Mondays, Wednesdays and Fridays. The station says it is a commercial venture, free of any political stance. Originally, the station tried to get a license to broadcast from Nigeria but was turned down. (The owner is a former Nigerian ambassador). Jakada Radio's studios are believed to be in Spain.

Peru sports another new station in **Radio Manantial** in Otuzco. It's operating on slightly **variable 5388** and running to 0100 quitting time. It airs religious programming in Spanish. Another new Peruvian is **Radio San Lorenzo on 5545**. The schedule is unclear so far, but chances are pretty good it calls it a night sometime around 0100 or 0200.

If you check **6070** you may find its well-known inhabitant CFRX is sometimes not at home these days. The transmitter has been down for a while (but, more recently was noted back on). All of the private Canadian shortwave broadcasters seen to be treading on thin ice – not exactly ranking as a high priority with ownership. So we suggest it might be a good thing if CFRX and its sisters were to get a whole lot of listener appreciation mail over the coming months.

An old Ecuadorian standby, **La Voz del Napo (3280)** has been sold. The new name is **Radio Maria Ecuador**. The name more or less gives away the fact that this is a Catholic religious broadcaster. It's quite often heard fairly well with its 2500 watts.

Argentina has a new one on the air – though it may not be entirely legitimate. **Radio Maranatha**, a relay of 1610 mediumwave, operating on **6215**. Based in Puerto Iguazu, it airs Christian programming in Spanish, Portuguese (when it goes by the name of Radio Baluarte), as well as Guarani. The schedule runs from 2300 to 0100 weekdays and 0000 to 0100 on weekends, however there may be occasions when it continues on past 0100. The station is owned by the Centro Evangelizacion Camino Nuevo and can be reached at: Radio Maranatha, Hipolito Yrigoyen esquina Andresito, 3370-Puerto Iguazu, Misiones, Argentina.

The new **Radio Okapi** in Congo-Kinshasha continues to be more widely heard than many expected would be the case. (No

Union of Myanmar
Ministry of Information
Myanma Radio & Television (M.R.TV)
Pyay Road, Yangon
(Fax: 951-525428 - Phone: 951-532814)

Date : 14th May 2002


To:
ROBERT BROSSELL
PERU
PERU
USA

Dear Sir,

It was a great pleasure to receive your letter and thank you for your reception report. We are pleased to verify your reception of Radio Myanmar.

We attach herewith our Programme Schedule and Media Index and hope that it would interest you. I'm very much regret for my late reply. It is owing to me by unexpected pressure of work in these days.

Best regards,


Ko Ko Htway
Director (Broadcasting)

Robert Brossell finally got Radio Myanmar to confirm his reception but it took some doing!

luck at GIG HQ, though!) Several people are noting it often in the plus 0300 period, despite QRM from co-channel Havana. When we checked after 0400 the other evening all we heard was English from Radio France International – and not all that well!

A similar situation exists with the Sierra Leone station **Radio UNAMSIL**, which is showing up in a few shacks after 0400 on its variable **6137** spot (**almost 6138**).

It now looks like the ham operators will be given a slice of the 5 MHz band (5.25 to 5.4) to play with one of these days. While this won't be a major detriment to SWBC DX'ing, it will make it more difficult to nab some of those out-of-band Latins, which hid out in the area.

Back in "ancient times" the venerable *World Radio (TV) Handbook* used to publish a Summer Supplement, which updated the main annual edition including the summer schedules of international broadcasters. But, by the mid-1950s the summer edition was history. Now, lo and behold, a sort of summer supplement is back, carrying the title "The Shortwave Guide." The new mid-year edition includes summer schedules, including domestic broadcasters, the usual contact information and color maps showing transmitter sites, plus various articles on short-

RTE

26 October 2001

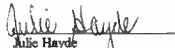
Mr Richard A. D'Angelo
 Wyomissing
 PA 19610
 U S A

Dear Mr D'Angelo

Thank you for your reception reports of 17 and 18 October 2001 of our transmissions on 13640 kHz and 6155 kHz at 1850 and 0130 respectively. I am enclosing our overseas brochure.

Best wishes for your future listening.

Yours sincerely


 Ailie Hayde
 Broadcasting Developments

Broadcasting Developments

Radio Telefís Éireann

Baile Átha Cliath 4 Éire
 Telefón 01 208 2350
 Facsimhír 01 208 3031

Dublin 4, Ireland
 Telephone 01 208 2350
 Telefax 01 208 3031

Abbreviations Used In This Month's Column

//	—	Parallel frequency
ABC	—	Australian Broadcasting Corporation
AFRTS	—	Armed Forces Radio Television Service
AFN	—	Armed Forces Network
AIR	—	All India Radio
anncr	—	announcer
anmt(s)	—	announcement(s)
BSKSA	—	Broadcasting Service of the Kingdom of Saudi Arabia
CNR	—	China National Radio
GOS	—	General Overseas Service
ID	—	identification
Int'l	—	international
IS	—	interval signal
Lang	—	language
LSB	—	lower sideband mode
NBC	—	National Broadcasting Corporation
OA	—	Peru, Peruvian
PBS	—	People's Broadcasting Station
Pgm	—	program
RRI	—	Radio Republik Indonesia
sked	—	schedule
SIBC	—	Solomon Islands Broadcasting Corporation
TOH	—	Top of the Hour
unid.	—	unidentified
USB	—	upper sideband mode
vern	—	vernacular (any local dialect or language)
VOA	—	Voice of America
VOIRI	—	Voice of the Islamic Republic of Iran

RTE (Ireland) confirmed Rich D'Angelo's reception with this letter.

wave listening. Taking a cue from *Passport to World Band Radio*, the schedules are presented in bar chart form. The book isn't quite off the press as this is written but based on pre-release information, it sounds as though it's going to be a valuable addition to any listening library. It's priced at around \$15 and should be available from the usual SWL suppliers.

Rick Barton - This Month's Book Winner!

Rick Barton of Phoenix, Arizona is our book winner this month. Rick has received a copy of the Helms *Shortwave Listening Guidebook* courtesy of Universal Radio in Ohio. Universal's catalog of wondrous radio stuff will absorb you for hours - that is, if you have a copy on hand to browse through! You can get a copy by calling Universal at (614) 866-4267, or you can drop them a line at 6830 Americana Parkway, Reynoldsburg, OH 43068.

Remember, your shortwave broadcast logs are always welcome. Just remember to list your catches by country, double or triple space between them and add your last name and state abbreviation after each. We're also looking for spare QSL cards we can use as illustrations. Also station schedules, station photos, shack photos, pennants, schedules - anything and everything you'd care to lay on us! As always, deepest thanks for your continued interest and support!

Here are this month's logs. All times are in UTC, which is five hours ahead of EST, i.e. 0000 UTC equals 7 p.m. EST, 6 p.m. CST, 5 p.m. MST and 4 p.m. PST. Double capital letters are language abbreviations (FF = French, AA = Arabic, SS = Spanish, etc.). If no language abbreviation is included the broadcast is assumed to have been in English.

ANTIGUA - Deutsche Welle relay, **15410** at 2355 in GG. **Parallel 15275** via Rwanda and 13780 Rwanda. (MacKenzie, CA)

ARGENTINA - Radio Maranatha, **6215** at 0015 with SS religious music, anmts, ads, jingles, sermon. Also a week later at 0030. (Alexander, PA) Tentative at 0230 with SS talk and group vocals. Weak and eventually faded completely. (D'Angelo, PA)

RAE, **11710** in EE at 0200 with request for reception reports. (Clapshaw, WA)

Radio Nacional, **15345** with music and talks in SS heard at 2240. (Brossell, WI)

ASCENSION ISLAND - BBC relay, **7160** at 0355 with African items, ID, news. (MacKenzie, CA) **15105** in FF at 1806. (Jeffery, NY) **17830** at 1822. (Brossell, WI)

AUSTRALIA - ABC Northern Territory Service, Alice Springs, **2310** at 1106. (Strawman, IA)

Voice International, **13635** with rock and talk at 1400. (Barton, AZ) **13685** at 1031 with review of "Scorpion King," IDs, Queensland address, religious tunes and features. (D'Angelo, PA) **13775** at 1250 with hymns and religious features. (Brossell, WI)

Radio Australia, **5995** with sports and ID from 0755. (Becker, WA) **6020** at 1230 and **9575** at 1220. (Northrup, MO) 11880 with "Asia Pacific" at 1014. (Jeffery, NY) **15515** at 0405 with news items. (Moser, IL) **21740** at 2334, //17795 and 17850. (MacKenzie, CA)

AUSTRIA - Adventist World Radio via Austria, **11710** in an African dialect at 0305. (Brossell, WI)

Radio Austria Int'l, **9870** with "Report From Austria" at 0150. (Limbach, PA)

BELGIUM - RTBF Int'l, **9970** opening at 0257 with national anthem, FF ID and 5 time pips and into news. (D'Angelo, PA)

BOLIVIA - Radio Mosoj Chaski, **3310** with SS Andean vocals heard at 0109. (Strawman, IA)

BOTSWANA - VOA relay, **9885** at 0300 with "Daybreak Africa." (Clapshaw, WA)

BRAZIL - Radio Bandeirantes, **9645** with PP and pop ballads at 0045. (Strawman, IA) **11925** in PP at 0300. (Clapshaw, WA)

Radio Cultura, **17815** at 2320 with PP talk, variety of romantic Brazilian ballads, light jazz. ID at 0001 and off with national anthem. //9615, both fair to good. (Alexander, PA)

BULGARIA - Radio Bulgaria, **9400** at 0030. (Clapshaw, WA) 2300 with IS, ID, schedule, news. (Burrow, WA) **11900** at 0400 opening with trumpet IS, ID and news. Not parallel to 9400. (Barton, AZ)



BURKINA FASO – RTV Burkina, **5030** at 2339 with high-life music, FF anmts. (Brossell, WI)

CANADA – Radio Canada Int'l, **13670** at 0115 mentioning a labor dispute affecting RCI broadcasts; "domestic CBC programming will be carried until the dispute is over." (Linonis, PA)

CHILE – Voz Cristiana, **11935** with Latin pops at 1220. Contact in Grand Rapids, MI given. (Barton, AZ)

CHINA – Xinjiang Peoples Broadcasting Station, Urumqi, **7385** monitored at 1154 with classical piano, YL with ID in CC at 1200. (Foss, Philippines) **9500** in CC at 0155. (Linonis, PA)

Yunnan Peoples Broadcasting Station, Kunming, **6037** in CC at 1226 with flute and male vocal. (Foss, Philippines)

Xizang PBS, **11695**, Lingshi, at 1230 with ID and CC talks. (Brossell, WI)

Central Peoples Broadcasting Station/China National Radio, **11980** in CC at 1200. (Barton, AZ) **17565** in CC at 0025. IS and anthem at 0030, talk by man. Also **17625** at 0020 in CC. Off by 0025. (MacKenzie, CA) **17550/17565** at 0005 in CC with talks by man and woman. (Jeffery, NY)

China Radio International, **9440** at 1225. (Northrup, MO) 11685 in Russian at 1946. (Foss, Philippines) **11975** in CC via Mali at 2317. (Brossell, WI) **15210** to SE Asia. Off at 1500. (Barton, AZ) **17710** at 0002 with comments and interview. QRM from RFI via Japan. (MacKenzie, CA)

Chinese Music Jammer, apparently against Radio Free Asia, **17640** at 1815. Also on 11990 at 1240.

CONGO – Radio Okapi, presumed, **9550** at 2130 with mostly continuous African vocals. Poor, with lots of co-channel QRM and splatter. (Alexander, PA)

CROATIA – Voice of Croatia, **9925** via Germany, at 0317: "And that brings us to the end of the news from the Voice of Croatia. Do join us tomorrow." Then in to SS at 0318. (Brossell, WI)

CUBA – Radio Rebelde, **5025** in SS at 0750. (Becker, WA)
Radio Havana Cuba, **11760** at 1405 with anthem, march and talk in SS. (Barton, AZ) **17705** in SS at 0010. (MacKenzie, CA)

CYPRUS – BBC relay, **12035** with news at 0030. (Brossell, WI) **15145** in RR at 1500. (Barton, AZ)

CZECH REPUBLIC – Radio Prague, **17345** (? gld) at 2245 with feature on women's fashions, ID in SS at 2300. (Wood, TN) (NOTE: Joe says he heard this one on an inexpensive Grundig Mini 100 PE portable over the strong electrical noise generated by the lawn mower he was riding!)

DENMARK – Radio Denmark, **11635** via Norway at 0130 in DD. (Linonis, PA)

DOMINICAN REPUBLIC – Radio Pueblo, **5010** (varying to 5020) at 0200 with ballad-type music. (Linonis, PA)

Radio Cristal Int'l, **5009.8** at 0220 with lively LA music, SS anmts, IDs. Sign off with national anthem at 0240. (Alexander, PA)

ECUADOR – Radio Centro, tentative, **3290** at 0935 with lively vocals and man with SS talk. (D'Angelo, PA)

Radio Quito, **9420** at 0744 with SS talk. (Becker, WA)
HCJB, **15140** at 0215 in SS. (Linonis, PA) **17660** in EE at 2116. (Jeffery, NY)

EGYPT – Radio Cairo, **9900** at 2300 with IS, ID, music. (Burrow, WA) 2356 with music, ID, "Let's Learn Arabic." (Limbach, PA) 0315 in AA. Also **12050** in AA at 1620. (Brossell, WI)

ENGLAND – BBC, **7325** in SS at 0035. (MacKenzie, CA) **9740** (via Singapore, gld) at 1345 with news, ID. (Northrup, MO) **15225** in RR at 1813. (Jeffery, NY)

FINLAND – YLE/Radio Finland, **17670** heard at 1220 in FF. (Brossell, WI)

FRANCE – Radio France Int'l, **15605** at 0735. (Barton, AZ) **17605** at 1600 with news. (Jeffery, NY)

FRENCH GUIANA – Swiss Radio Int'l relay, **11905** in FF at 2205. (Brossell, WI) **17735** at 1941 with "Sounds Good." (Jeffery, NY)

GERMANY – Deutsche Welle, **17730** in GG at 1435. (Via Antigua, gld) **17845** in GG with classical music at 1430. (Northrup, MO)

Radio Africa Int'l, **15265** with EE talk show at 1819, ID, music, "Time Out" program and transmitter site info. (Jeffery, NY)

GREECE – Voice of Greece, **7475** in Greek at 0315, // **9420** and **15630**. (MacKenzie, CA) **12110** in Greek at 2325. Also 1830 on **15630** with EE music dedication program; then into a Slavic language program for Europe. (Brossell, WI)

GUAM – Trans World Radio/KTWR on **12130** at 1215 in CC. (Brossell, WI)

Adventist World Radio/KSDA, **12130** with opera heard at 1150. (Barton, AZ)

GUATEMALA – Radio Buenas Nuevas, **4800** with SS songs at 0223. (Brossell, WI)

Radio Cultural, **3300** with man and woman in SS heard at 0748. (Becker, WA)

GUYANA – Voice of Guyana, **3291.3** heard at 0210 with woman hosting listener phone calls and occasional music segments in between. ID at 0238 and into a program called "Straight From the Heart." (D'Angelo, PA)

HAWAII – KWHR, **11565** at 0845 with woman and religious program. (Barton, AZ) 1240 with a sermon. (Brossell, WI)

AFRS/AFN, **10320** heard at 0200. (Clapshaw, WA) 0355 with "Parent's Journal" program on teaching kids manners and integrity. (Brossell, WI)

HONDURAS – HRMI (presumed) **5010** at 0240. Heard only during this 14 minute window after Dominican Republic signs off until covered by a strong Madagascar at 0254 sign on. (Alexander, PA)

La Voz Evangelica, **4819** at 1125 with religious programming. (Barton, AZ)

Radio Luz y Vida, **3250** heard at 0333 with SS talks and music. (Brossell, WI)

HUNGARY – Radio Budapest, **15455** in SS at 2245. (Brossell, WI)



This QSL from the then Radio Roma, Italy, is for reception on 9575 back in 1957! (Thanks Mike Clapshaw, WA)

INDIA – All India Radio, **10330** with vocal music at 1223. (Barton, AZ) 1428 with folk song-type music. (Foss, Philippines) **11620** at 1800. **13620** Bangalore at 0230. (Clapshaw, WA) **11710** at 1230 with vocals in presumed Hindi. (Brossell, WI)

INDONESIA – Voice of Indonesia, **9525** with anthem, closing EE at 1258. (Barton, AZ) **15150** at 2000 with ID, program preview, news. (Burrow, WA)

IRAN – Voice of the Islamic Republic of Iran, **11690** at 1930 with ID, schedule, Koran, ID and into news. (Burrow, WA) **13605** in AA at 0020. (Clapshaw, WA) **13710** in presumed Farsi at 0353. Also **13730** in SS at 0304 and **11935** at 0235 in AA. (Brossell, WI) **15084** at 0200, into news in presumed Farsi. (Linonis, PA) **15585** in AA at 1209. (Foss, Philippines)

ISRAEL – Kol Israel, **13580** with news in HH at 0100. (Linonis, PA) **15640** at 1911 with news, IDs, IS from 1925 to ID at 1930 and into FF. (Burrow, WA) **15760** with the Reshet Bet network in HH at 2340. (MacKenzie, CA)

Galei Zahal, **6973** in HH at 0215. Off at 0257 and switching to **15785** which signed on at 0257. Both good. (Alexander, PA)

ITALY – RAI Int'l, **11800** in SS at 1240. (Brossell, WI) **17780** in II at 1855. (Barton, AZ)

JAPAN – Radio Japan/NHK, **13630** with music at 0810. (Barton, AZ) **15325** in JJ at 0347. (Brossell, WI) **17810** in SS at 2350. (MacKenzie, CA) **17825//21670** with news at 2145. (Barton, AZ) **21670** at 2149 with cherry blossom traditions in Japan. (Foss, Philippines)

JORDAN – Radio Jordan, **11690** at 1500 with EE news, ID as "Radio Jordan, 96.3 FM." (Burrow, WA)

KUWAIT – Radio Kuwait, **11675** in AA at 0315. Also **11990** at 1620 and **15505** at 1830, all in AA. (Brossell, WI) **11990** in EE at 1903. (Burrow, WA) **15495** in AA at 2345. (MacKenzie, CA) 0220 with Holy Koran. (Linonis, PA) **15110** in AA at 1330. (Northrup, MO)

LIBERIA – Radio Liberia Int'l, **6100** at 0640 with continuous Christian music till EE ID. Then they must have changed antennas as signal and audio dropped below the noise floor. (Montgomery, PA)

LITHUANIA – Radio Vilnius, **9875** in unid. language with IS, ID at 2250. (Burrow, WA)

MADAGASCAR – RT Madagascar, **5010** at 0254 sign on with IS, anthem, short anmt in vernacular and into church service with local religious music, sermon in local language. (Alexander, PA)

MALAYSIA – Radio Malaysia, Sarawak, **4895** at 1452 with local folk music. (Foss, Philippines) 1533 with music, "Radio 4 – RTM" ID, public service anmts, more music. (Burrow, WA)

MALI – RT V Malienne, **4835** in FF at 2345. (Jeffery, NY)

MALTA – Voice of the Mediterranean, **12060**, via Russia, at 1919 with interview, report on Maltese farmhouse restorations, ID and addresses. (Burrow, WA)

MEXICO – Radio Mexico Int'l, **11770** at 1234 with "Esta es Radio Mexico Internacional," frequencies and music. (Brossell, WI)

Radio Educacion, **6185** in SS at 0405 with classical music. (MacKenzie, CA)

MONGOLIA – Voice of Mongolia, **12015** at 0959 sign on with ID, woman with "Welcome to the Voice of Mongolia in English." Discussion and mailbag program. (D'Angelo, PA)

MOROCCO – Voice of America relay, **7275** at 0337. (Brossell, WI) **15410** with "Border Crossings" at 1916. (Jeffery, NY)

NETHERLANDS ANTILLES – Radio Netherlands Bonaire relay, **9790** with current events at 1000. (Barton, AZ) **15315** in SS at 0118. (MacKenzie, CA) **21590** at 1827 with frequency info, ID and "Newslines." (Jeffery, NY)

NEW ZEALAND – Radio New Zealand Int'l, **11675** at 1225 with "Sports World," promo for coverage of the National Rugby League and commercial for a hotel chain. (Brossell, WI) **15340** at 0505 with news, NZ weather and "Outlook." **17675** with music program at 0214. (Jeffery, NY) "Sunday Supplement" program at 2255. (Foss, Philippines) 0017 with news. (MacKenzie, CA)

NIGERIA – Voice of Nigeria, **7255** with news at 0500. (Jeffery, NY) **15120** with mailbag program at 0650. (Barton, AZ)

NORTH KOREA – Voice of Korea, **9335//11710** at 1445 with



TURKMEN RADIO

National Television & Radio
Broadcasting Company of
Turkmenistan



Dear Richard H. D'Angelo

Q Thank you for your reception report. We are pleased to verify your
S reception of Turkmen Radio:
L

Date of Reception: 06.08.2002
Time: 02:08-23:00 (308-7:10) UTC
Frequency: 5015 kHz
Transmitter Power: 20 kilowatts

Signature

Official Seal

Turkmen Radio confirmed Rich D'Angelo's reception with this card.

usual fare. (Barton, AZ) **9975//11735** at 1614 with report on birthday celebrations for Kim Il Sung. (Burrow, WA) **11710** in FF with presumed news at 1605. (Brossell, WI)

NORTHERN MARIANAS – Radio Australia relay, **21615** in unid. language at 006 with IS, and possible news. (Jeffery, NY)

Far East Broadcasting Co./KFBS, **11580** with music and talks in CC at 1205. (Brossell, WI)

NORWAY – Norwegian domestic radio, **9960** in NN at 0319. Also **13800** at 0307. (Brossell, WI)

OMAN – BBC relay, **11955** heard at 0056 sign on. Multiple IDs prior to 0059 time pips, World Service ID, TC for one o'clock GMT and "World Today" program. Uncertain if this is the old site or the new. (D'Angelo, PA)

PAKISTAN – Radio Pakistan, **11570//15100** at 1553 in unid. language. ID at 1605, anthem and off without going into EE service. (Burrow, WA) **17520** at 1000 with 3 time pips, woman with EE ID and news. Into non-EE at 1605. (Montgomery, PA)

PAPUA NEW GUINEA – NBC Port Moresby, **4890** at 0805 with local island music. (Becker, WA)

PERU – Radio Peru, **5637.2** at 0150 with SS anmts, OA folk, ID. Abrupt sign off at 0205. (Alexander, PA)

Radio Huancabamba, **6536** at 0130 with long SS talks, IDs, TCs and OA vocals. Off at 0212 with long orchestral national anthem. (D'Angelo, PA) 0140 with OA folk music, SS anmts, ID, SS ballads, phone talk, off with anthem at 0212. (Alexander, PA)

Radio Illucan, **5678** at 0150 with SS talk, OA folk music, ID. Off abruptly at 0206. (Alexander, PA)

Ondas del Rio Mayo, **6797.5** at 0135 with SS pops, ballads, OA folk, SS anmts, ID and sign off with anthem at 0200. (Alexander, PA)

Radio del Pacifico, tentative, **4975** heard at 0735 with SS talks. (Becker, WA)

PHILIPPINES – Voice of America relay, **11760** at 2307 with news reports. (Brossell, WI) **15190** at 1900. (Burrow, WA) **17765** in CC at 0016. (Jeffery, NY)

FEBC, **11640** at 0300 in possible Indonesian. (Linonis, PA)

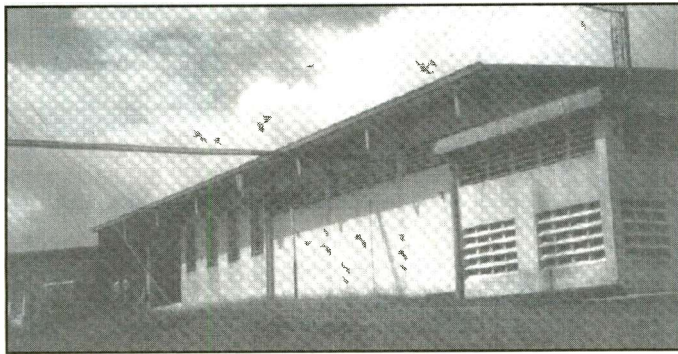
RDP Int'l, **13700** at 0115 in PP with "Portugal Desportiva" sports program. (Linonis, PA) **17615** at 1830 with live soccer match in PP. The screaming anner would go ballistic when they made a goal. (Brossell, WI)

ROMANIA – Radio Romania Int'l, **9570** at 2308 with news, ID, commentary. (Burrow, WA) **11775** at 2315. (Limbach, PA) **11940** at 0251 with talk on US Mideast policy. At 0256: "Our broadcast to North America has come to an end. Please tune in again tomorrow." (Brossell, WI) **15180** at 0210 with talk in EE. (Linonis, PA)

RUSSIA – Radio Rossii, **11840** via Sakhalin, at 1005 with various RR talk features, numerous IDs and music fills. (D'Angelo, PA) **12025** in RR. (Brossell, WI)

Voice of Russia, 11750 at 0420 answering listener questions. (Moser, IL) **15295** at 1335 on Russian enterprise. (Northrup, MO)

Deutsche Welle relay **9900** in GG at 1600. (Barton, AZ) **21790** via Petropavlovsk at 2330. (MacKenzie, CA)



Here's the home of Ecos del Torbes (4980), perched on a hill overlooking San Cristobal. (Thanks to Don Moore, IA)

RWANDA – Deutsche Welle relay, **11785** in GG at 2310. (Brossell, WI) **11805** at 1931. (Foss, Philippines) **15390** with news in EE at 1903. (Jeffery, NY) **17860** in GG at 2345. (MacKenzie, CA)

SAO TOME – Voice of America relay, **7290** at 0345 with “Nightline” program and ham operator QRM. (MacKenzie, CA)

SAUDI ARABIA – BSKSA **9550** at 2153 with vocals, AA ID on the hour, discussion program. Closes at 2300. (D’Angelo, PA) **17895** at 1420 with call to prayer. (Barton, AZ)

SEYCHELLES – BBC relay, **15420** at 0350 with program on Uganda since Idi Amin. (Brossell, WI)

SIERRA LEONE – Radio Unamsil, **6137.8** at 0639 with ID as “Radio National,” then talks about Nigeria, mentions of Sierra Leone and brief music segments. (Montgomery, PA)

SINGAPORE – Radio Singapore, **6150** with news at 1330. (Barton, AZ) **1500** with music and ID as “Perfect Ten – 97 FM.” (Burrow, WA) BBC relay, **17790** at 0030. (Jeffery, NY)

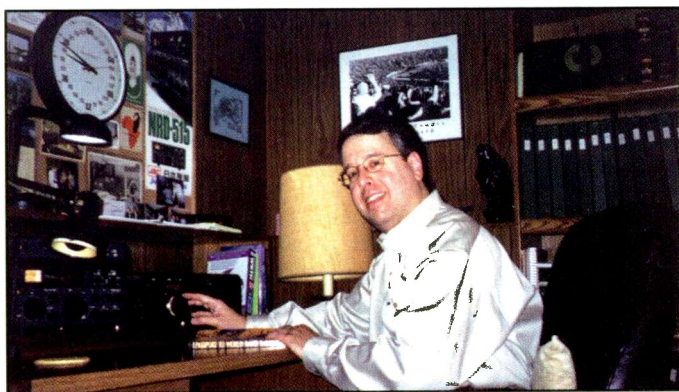
SOLOMON ISLANDS – SIBC, **5020** at 0949 with nice ID at 0958 “This is the National Service of the Solomon Islands Broadcasting Corporation – Radio Happy Isles coming to you from our studios in Honiara. Radio Happy Isles keeping you informed of news from around the world.” Then news in EE. (D’Angelo, PA) 0745 with news, talk, old pops. Can’t quite tell if it’s Pidgin or English, but I think Pidgin. (Becker, WA) 1006 with news by woman with a heavy accent. This was not the usual BBC programming. (Montgomery, PA)

SOUTH AFRICA – Channel Africa, **15215** at 0600 with woman and news after 5 time pips at top of the hour. ID at 0625 and language change at 0630. (Montgomery, PA) **17770** at 1519 with news and economic reports, ID at 1527. (Burrow, WA)

BBC via Meyerton, **7120** at 0301. (Jeffery, PA) 0400 with ID “Broadcasting around the world 24 hours a day, this is the BBC.” (Brossell, WI)

SOUTH KOREA – Radio Korea Int’l, **13670** to Asia at 1010. (Barton, AZ)

SPAIN – Radio Exterior de Espana, via Costa Rica, **3350** at 0330, //6125. (Brossell, WI) **15170** in SS at 1335. (Northrup, MO)



Another visitor to GIG HQ was old friend (and new subscriber) Tom Gavaras (MN). Tom uses a computer-based Ten-Tec 320. He lives just off the edge of the Twin Cities metro map.

SRI LANKA – Sri Lanka Broadcasting Corp., **15425** at 0200 with US pops. (Linonis, PA) 1507 with news, frequencies, ID, music. (Burrow, WA)

Deutsche Welle relay, **17860** in GG at 0035. (Jeffery, NY)

SWEDEN – Radio Sweden, **9490** at 0345 with feature on Peru. (Moser, IL) **13765** at 1247 in presumed Swedish. (Brossell, WI)

SWAZILAND – Trans World Radio, **7240** at 0258 with man and EE ID, chime-like IS several times. Into Swahili. (Montgomery, PA)

SYRIA – Radio Damascus, **12085//13610** at 2004 with music, ID, into EE service at 2008, ID again and into news at 2010. (Burrow, WA) 2219 in AA. Also in SS at 2322 on both frequencies. (Brossell, WI) **13610** at 2110. (Clapshaw, WA)

TAIWAN – Radio Taipei Int’l, **9680** via WYFR at 0340 with “Asia-Pacific Report.” Also **11565** via WYFR at 2250 with EE/CC lesson. (Limbach, PA) **15600** via WYFR at 2225. (Barton, AZ)

THAILAND – BBC relay, **17615** with news at 0015. (Jeffery, NY) 0022. (MacKenzie, CA)

TUNISIA – RTV Tunisienne, **12005** with AA music at 0240. (Brossell, WI) 0315. (Clapshaw, WA)

TURKEY – Voice of Turkey, **11655** at 0300 with ID, schedule, news in EE. (Burrow, WA) 0310 with news. Also **12000//11960** at 2213. (Brossell, WI)

UKRAINE – Radio Ukraine Int’l, **12040** at 0001 with regional news, “Ukraine Today.” (Limbach, PA) 0335 on cultural differences of Ukrainians who’ve relocated to Moscow. (Brossell, WI)

UNITED ARAB EMIRATES – UAE Radio, Dubai, **13675** with Arab-Muslim institutions and other features. (Moser, IL)

UNITED STATES – Emerald Radio, **5070**, over WWCR at 1038 with features, many IDs, “Celtic Shadows” program. Cut at 1059 with man giving WWCR frequency sked. Good here but very poor on //15825. (D’Angelo, PA)

UZBEKISTAN – Radio Tashkent, **11905** at 2030 with IS, ID, frequencies, ID and into news. (Burrow, WA)

VATICAN STATE – Vatican Radio, **5890** at 0233 with various Eastern European language segments, presumably direct from the Vatican Gardens site. //4005 covered by utes. (D’Angelo, PA) **7305//9605** in SS at 0340. (MacKenzie, CA) **9605** in SS at 0145. (Linonis, PA) **13765//15235** at 1550 with IS, “Vatican Radio to Southeast Asia,” schedule and into “New Millennium” program. (Burrow, WA)

VENEZUELA – Ecos del Torbes, **4980** in SS at 0132. Man with classical selections. (Jeffery, NY)

Radio Tachira, **4830** at 0200 in SS with lively music and “CODAR” QRM. (Linonis, PA)

VIETNAM – Voice of Vietnam, Son Tay, **9840** from 1000 sign on with music, woman with opening ID “You are listening to the Voice of Vietnam. Now the news.” Fair, with //12020 slightly stronger. (D’Angelo, PA) **11640** at 1608 with news, ID. (Burrow, WA) 2050 with external service in EE. (Strawman, IA)

ZAMBIA – Zambia Broadcasting Service, **6265** at 0256 with multilingual ID including “This is the Zambia Broadcasting Service, ZB1”. Drums, vocal groups and ID in unid African dialect. (Brossell, WI)

ZANZIBAR – Radio Tanzania, **11734** at 1830 to 1930 or so fade out. (Clapshaw, WA) (Presume this was in Swahili? Gld)

And that does it! Thanks in the extreme to the following folks who checked in this month:

Rick Barton, Phoenix, AZ; Jack Linonis, Hermitage, PA; Bruce R. Burrow, Snoqualmie, WA; Dave Jeffery, Niagara Falls, NY; Brian Alexander, Mechanicsburg, OH; Pete Becker, Clarkson, WA; Robert Montgomery, Levittown, PA; Brian Limbach, Pittsburgh, PA; Rich D’Angelo, Wyomissing, PA; Mark Northrup, Gladstone, MO; Howard Moser, Lincolnshire, IL; Marty Foss, Guinayangan, Philippines; Mike Clapshaw, Port Angeles, WA; Robert Brossell, Pewaukee, WI; Jerry Strawman, Des Moines, IA; and Stewart MacKenzie, Huntington Beach, CA. Thanks to each one of you!

Next month we celebrate 20 years of The Listening Post/Global Information Guide! Until then – good listening!

Going The Distance: Monitoring Aircraft On Shortwave

Sometimes it's difficult to write columns. Sometimes it may be a mental block, at other times it may be due to constraints placed by regulation or conscience. I'm trying to give as much information as possible without sacrificing security. After all, it's been just 12 months since the attack on our soil. This is where I have problems. Granted there is nothing that I place in this column that can be considered "classified," but at the same time it may be considered "of a sensitive nature." Yet I try to get accurate information to you while considering national security. I trust I'm doing this properly.

Up to now all frequencies, with few exceptions, are classic civilian and military aviation VHF and UHF frequencies normally used for relatively short range communications to approach controls, towers, centers, and flight service stations. However, many military and air carrier aircraft travel great distances overseas, well out of reach of normal VHF/UHF frequencies. So, this month I'm going to give you HF frequencies used by military aircraft worldwide for their long-distance communications plus information on how you can get them updated for free on the Internet.

The Flight Information Handbook (FIH) in book-form is the size of a small paperback novel, roughly 6 x 9 inches and about 230 pages. Much of the information is dry and unusable for most aviation scanning. There are very few frequencies in many of the sections except for mid-section-B "National/International Flight Data/Procedures." In the current book, which is effective from March 21 to October 31 of this year, pages B-39 to B-64 contain a major selection of HF frequencies with a brief background and history of the USAF GLOBAL COMMUNICATIONS SYSTEM which is a consolidation of the old USAF Global Command and Control System (GCCS), the old Strategic Air Command's Giant Talk System, and the old Navy's Ship-to-Shore (HICOM) network.

Fortunately you can access all this information online by going to <<http://164.214.2.62/products/digitalaero/index.html>>. This will take you to the main page of the Digital Aeronautical Flight Information File. But to go to where the downloads are go to <http://164.214.2.62/products/digitalaero/dafifindex.cfm#flip>. The biggest problem is these are extremely large files: the FIH is 10.9 MB alone with other downloads running from 2.41 to 29.5 MB. Needless to say, slow computers with low memory and 56 k modems would have a heck of a long time downloading. But for those truly interested in HF aviation monitoring, I believe it would be worth it.

Surprisingly on page B-45 of the current FIH there is a list of recommended frequency bands to use when contacting various stations, based on time of day at the ground station and distance from the ground station. Can we say *propagation*?

There are a handful of frequencies that are available on virtually all of the Global HF Systems. They include 3137, 4721, 5708, 6721, 9025, 11226, 13215, 15043, 18003, and 23337. I believe all transmissions are in AM. Keep me informed as to what you hear.

Golden Knights Frequencies

Richard Ericksberg was kind enough to send me some Golden Knights frequencies. They are 32.3, 42.35, and 123.4. He also sent additional frequencies for the Thunderbirds and the Blue Angels. I'm including them here in their entirety.

114.9500	TBIRDS (UNKNOWN DESIGNATION)
120.4500	TBIRDS (Operations)
124.9300	TBIRDS (UNKNOWN DESIGNATION)
138.8750	TBIRDS (Parachutists)
140.0000	TBIRDS (UNKNOWN DESIGNATION)
140.4000	TBIRDS (Air to Air Tactical)
141.4000	TBIRDS (4 Plane Formation)
141.8500	TBIRDS (AIR TO AIR LEADER 1)
142.0000	TBIRDS (UNKNOWN DESIGNATION)
143.8500	TBIRDS (AIR TO AIR LEADER 2)
148.1750	TBIRDS (Ground Support)
148.5500	TBIRDS (Maintenance)
235.2500	TBIRDS (GROUND SHOW START)
236.5500	TBIRDS (AIR TO AIR)
236.6000	TBIRDS (Air to Air)
250.8500	TBIRDS (Team Leader)
241.4000	TBIRDS (Solo)
273.5000	TBIRDS (Solo F-2)
283.5000	TBIRDS (Solo F-3)
294.7000	TBIRDS (Air to Air)
295.7000	TBIRDS (Air to Air F-1)
322.3000	TBIRDS (Air to Air F-4)
322.6000	TBIRDS (Air to Air F-5)
322.9500	TBIRDS (AIR TO AIR 2ND TEAM)
382.9000	TBIRDS (Air to Air F-6)
394.0000	TBIRDS (Air to Air F-7)
413.0000	TBIRDS (GROUND CREW)
413.0250	TBIRDS (GROUND CREW)
413.1000	TBIRDS (GROUND CREW)
121.9000	Blue Angels (GROUND SUPPORT)
123.4000	Blue Angels (COMMON AIRSHOW)
134.1000	Blue Angels (GCA COMMON)
141.5600	Blue Angels (MAINT CHARLIE)
142.0000	Blue Angels (MAINT ALFA)
142.0250	Blue Angels (MAINT DELTA)
142.2625	Blue Angels (GROUND SUPPORT)
142.6250	Blue Angels (MAINT CHARLIE)
143.0000	Blue Angels (MAINT BRAVO)
143.6000	Blue Angels (MAINT ECHO)
241.4000	Blue Angels (Air to Air)
250.8000	Blue Angels (Air to Air)
251.6000	Blue Angels (Air to Air 5-6)
263.3500	Blue Angels (FLIGHT LINE)
263.5000	Blue Angels (Air to Air)
275.3500	Blue Angels (COMM 1 LEAD)
302.1000	Blue Angels (COMM 2 TALKBACK)

NEW/CHANGED/DELETED AIRPORT IDs AND ABANDONED AIRPORTS

NEW

AL
 Fort Rucker/Dothan, Toth Stagefield AHP Heliport 24AL
 Fort Rucker/Elba, Runkle Stagefield AHP Heliport 20AL
 Fort Rucker/Hartford, Highbluff Stagefield AHP Heliport 14AL
 Fort Rucker/Hartford, Highfalls Stagefield AHP Heliport 15AL
 Fort Rucker/Hartford, Louisville Stagefield AHP Heliport 18AL
 Fort Rucker/Kirklands Crossroads, Goldberg Stagefield AHP Heliport 12AL
 Fort Rucker/New Brockton, Stinson Stagefield AHP Heliport 22AL
 Fort Rucker/Newton, Hunt Stagefield AHP Heliport 17AL
 Fort Rucker/Opp, Skelly Stagefield AHP Heliport 21AL
 Fort Rucker/Ozark, Ech Stagefield AHP Heliport 11AL
 Fort Rucker/Ozark, Hatch Stagefield AHP Heliport 13AL
 Fort Rucker/Ozark, Hooper Stagefield AHP Heliport 16AL
 Fort Rucker/Ozark, Molinelli Stagefield AHP Heliport 19AL
 Fort Rucker/Ozark, Tabernacle Stagefield AHP Heliport 23AL

AK
 Levelock Airport 9Z8
 Wasilla, Cottonwood Lake Seaplane Base 3H3

CA
 Twentynine Palms, Bauer Airport 61CA

CT
 Mashantucket, MPTN Heliport 14CT
 Wallingford, Hummingbird Heliport 4C3
 Winsted, Seavair's Landing Seaplane Base 08CT

FL
 Cross Creek, Rimes Lakecrest Airport 35FA
 Fort Lauderdale, Downtown Heliport DT1
 Kissimmee, Magic Air Adventure Heliport 36FA
 Rockledge, Gezik Seaplane Base 34FA

IA
 Bloomfield, Davis County Hospital Heliport 63IA

KS
 Wamego, Miller Aeroplane Field Airport 83KS

ME
 Searsmont, Ridgeview Airport 12ME

MA
 Belchertown, Norm's Field Airport 31MA

MS
 Woodville, Green Acres Airport 12MS

MT
 Sand Coulee, Prill Field Airport 1MT7
 Trout Creek, Craik Airport 29MT

NH
 North Conway, Memorial Hospital Heliport 08NH

PR
 Vega Baja, Cuylers Airport 02PR

TX
 Alpine, Big Bend Regional Medical Center Heliport 17TS
 Argyle, Furst Ranch Heliport 24XS
 Austin, MGM Heliport TS23
 Bonham, Reward Ranch Airport TA22
 Childress, Regional Medical Center Heliport TA91
 Columbus, Reimers Field Airport TS27
 Dimmitt, Ott Farms Airport 7TS8
 Harris, McGill Ranch Heliport 8TE9
 Howe, Kahuna Bay Airport 1TE8
 Hubbard, Bar 16 Airport 1TS2
 Jersey Village, State Police Heliport 4TS6
 Lubbock, Reese Airpark Airport 8XS8
 Pflugerville, Aero Heliport 9TA0
 Scurry, Twin Acres Airport 9TE0
 Sherman, Beaver Creek Airport 9XS2
 Thrall, Camelot Airport 54TE
 Waxahachie, Air Ranch Estates Airport 60TA
 Whitney, Rocking A Airport 78TE

CHANGED

WI
 Cornell Municipal Airport was 4T5, now 2WN8

ABANDONED

FL
 Key West, Gulf of Mexico Seaplane Base 6FL5
 Kissimmee, Walker Ranch 64FL
 Orlando, Falcon Heliport FA25

IA
 Alburnett, Pete's Patch Airport IA20

NC
 Hendersonville, Ritter Airpark Airport NC33

PA
 Benezett, Elk View Heliport PA00
 Mount Joy, Walnut Grove Airport 40PN
 Shaner, Sugar-Bob Airport PN98

TN
 Nashville, Evans Enterprises Airport TN23

WA
 Tacoma, Clover Park Technical College Airport 6WA8

NEW/CHANGED/DELETED FREQUENCIES

NEW

AK

Anchorage ARTCC (ZAN)
 Bethel RCAG 127.5/351.85
 Kodiak RCAG 132.65/273.55
 Middleton Island RCAG 124.05/279.55
 Levelock Airport (9Z8)
 CTAF 122.9
 Wasilla, Cottonwood Lake Seaplane Base (3H3)
 CTAF 122.9

CT

Wallingford, Hummingbird Heliport (4C3)
 CTAF 122.9
 Unicom 123.05

FL

Fort Lauderdale, Downtown Heliport (DT1)
 CTAF 123.05

GU

Agana, Guam CERAP (ZUA)
 CERAP 269.0

IN

Rochester, Fulton County (RCR)
 AWOS-3 118.775

NC

Oxford, Henderson-Oxford (HNZ)
 ASOS 118.625

NM

Belen, Alexander Municipal (E80)
 CTAF 122.9

OH

Hillsboro, Highland County (HOC)
 AWOS-3 118.175

SC

Hartsville Regional (HVS)
 AWOS-3 118.225
 Winnsboro, Fairfield County (FDW)
 AWOS-3 119.075

TX

Alpine, Big Bend Regional Medical Center Heliport (17TS)
 Unicom 122.8
 Waxahachie, Air Ranch Estates Airport (60TA)
 Unicom 122.975

CHANGED

AZ

Tucson, Davis-Monthan AFB (DMA)
 Apch was 118.5, now 119.4

CA

Bakersfield, Meadows Field (BFL)
 Apch was 362.3, now 284.625

CT

Madison (MAD)
 RCO was 122.1, now 122.15

GU

Agana, Guam International (GUM)
 Apch was 119.8/269.0/269.5/270.8, now 118.7/279.5

DELETED

HI

Honolulu International (HNL)
 GC 121.8

IN

Knox, Wheeler Airport (3C5)
 CTAF 122.9

NM

Belen, Alexander Municipal (E80)
 UNICOM 122.8

302.1500 Blue Angels (COMM 3 SOLOS)
 307.7000 Blue Angels (Air to Air)
 319.8000 Blue Angels
 345.9000 Blue Angels (AIR TO AIR)
 360.4000 Blue Angels (Solos)
 362.6000 Blue Angels (AIR SHOW CTRL)
 384.4000 Blue Angels (Air to Air)
 391.9000 Blue Angels (Air to Air)
 395.0000 Blue Angels (Air to Air)
 395.9000 Blue Angels
 408.4000 Blue Angels (GROUND SUPPORT)
 418.0500 Blue Angels (GROUND SUPPORT)

Dear Bill,

Your caption under the photo of the Ryan Navion on page 70 of the July *Pop'Comm* says "...I don't believe it was ever used by the Air Force."

It was, in fact, used by the Air Force under the designation L-17. Many of them found their way into the CAP inventory after the Air Force phased them out. That's where I got my first ride in one.

I've been a constant subscriber to *Pop'Comm* since Volume 1, Issue 2. It's a great magazine.

Regards,

Don Osterhaus, KØTUY, Council Bluffs, Iowa

Thanks, Don. I appreciate all information I can get.

I trust you can use this month's information. Keep me informed as to what you hear. And keep monitoring, praying, and giving blood.

See you next month for Halloween. ■

I enjoy hearing from various readers and even being corrected. In the June issue the caption for the Navion aircraft stated that I didn't believe it had been in use by the Air Force. Well, I was incorrect. Don Osterhaus wrote:

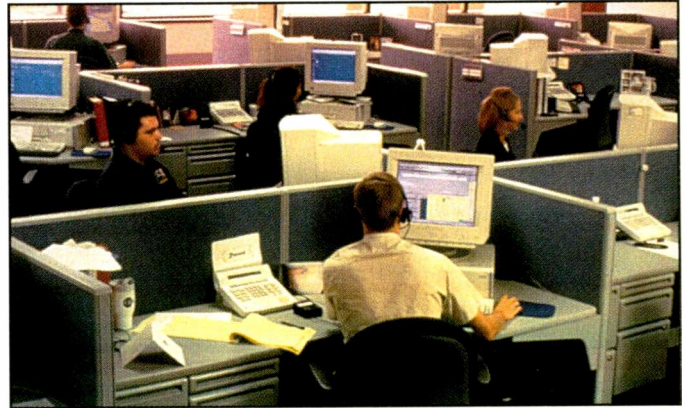
Telematics—It's Not Just For Batman!

Will this summer heat ever end? Sometimes September just can't seem to come soon enough. And although this is the September issue of *Pop'Comm*, this issue will be in the mail and on the stands by about August 1. The point is that many of us still have summer travel plans just ahead. And "On-The-Go Radio" still has quite a bit of information on telematics and on equipping your mobile shack for both distant travel and everyday around-town use. I will also be starting to include more news on CB clubs and their activities. Have you found our mini-product reviews and "honorable mentions" of certain products or services interesting? A number of you have written that you have. I've got several more for you this month, right here!

In the last year or so, the television airwaves have been alive with commercial advertisements featuring Batman in his Batmobile, equipped with the General Motors OnStar telematics system. If you have been following this column for the past several months, then you have a good general concept as to just what this admittedly nebulous term, "telematics" is about. OnStar, however, is a specific product and service line from a specific provider: Detroit's own General Motors Corporation. GM manufactures everything from Chevrolets to Saturns and beyond, of course. So it comes as no surprise that GM did not hesitate to jump into telematics technology right about the point in history when this term was just coming into common use.

Each purveyor of telematics products and services has its own ideas about which particular service or product should be the greater aspect; that is, the more important and useful component of a telematics system. In the case of the OnStar package, the present system consists of an embedded cellular mobile phone transceiver in selected General Motors vehicles (and possibly now a few other makes). It also includes a Global Positioning System (GPS) receiver, GPS data modem, and a three-button miniature control head placed at differing locations within the cockpits of differing vehicles. A CPU and firmware to coordinate the actions of the three control buttons and their respective functions obviously reside somewhere within the vehicle system. These components are neatly wrapped up in a single conceptual package. You can spot many OnStar-equipped automobile models in new vehicle inventory at some GM dealerships. Look for the black stylized spike/sharkfin hybrid antenna often sprouting from the passenger compartment roof or truck cab, just forward of where the driver's head would be. Other models may use stealthier antennas. It is important to bear in mind that factory-installed telematics packages are not transferable from one vehicle to another, such as at trade-in time. If you really like what you find in the OnStar system, and really desire to experience for yourself what Batman has known for some time now, then you will have to buy a vehicle already equipped with OnStar.

The clever television and print ads for OnStar do point out a few of the system's features. Still, they do little to give an understanding of how the system works, everything it can do, and what it costs to subscribe. Consumers or anyone else who would



An OnStar call center, with OnStar Advisors. (Photo courtesy of OnStar)

like to learn the basics of the telematics system should visit the OnStar Web site at <www.onstar.com>. Let's take a look at what the OnStar system does, basically, for its subscribers. Although this is a complex technology, think simple: just three buttons, remember! The main functional button is the one with the OnStar logo. Pressing this connects the vehicle's driver to the OnStar Advisor at a customer service center. A GPS "shot"—an instantaneous latitude and longitude fix—is also transmitted digitally on the same cellular circuit as your call, along with vehicle and engine operational data. Users have a hands-free, or speakerphone, setup with which to speak to the advisor.

What Can OnStar Advisors Do For Their Subscribers?

That depends on which of the three service plans a subscriber has chosen. The basic "Safe & Sound" plan provides for emergency services, roadside assistance, stolen vehicle tracking, remote door unlock, remote diagnostics, online concierge, and other useful services. The mid-level "Directions & Connections" plan adds route support guidance, ride assist ("call me a cab"), and information and convenience services, such as where to find a gas station. Get the top-level "Luxury & Leisure" service plan and subscribers will also receive personal concierge service to "plan entire trips, make reservations, even get tickets to sold-out events," according to OnStar. Hmmm, this top-of-the-line service could really be worth something! Notice that I refer to OnStar users as "subscribers." That's because there is a recurring monthly charge for any of these fascinating service plans. The good news is that they start out fairly modestly. At press time, the basic service plan is listed at \$16.95 per month. Not bad! The mid-level plan lists at \$34.95 per month, and the top-level services list at \$69.95 per month. (All prices as indicated on the OnStar Web site.) Sold-out event tickets are not included in pricing, I dare to presume.

I haven't yet mentioned cellular calling plan terms available



Graphic of the three OnStar control buttons. (Photo courtesy of OnStar)



Close-up of the OnStar control head mounted in a ceiling console. (Photo courtesy of OnStar)

through OnStar. Calling plans are sold on an *à la carte* subscription basis. OnStar customers press the button with the white dot to connect to or to order cellular service. Many OnStar subscribers may elect not to have a calling plan if they already have a handheld portable phone to carry with them. The odd thing, however, is that OnStar's cellular calling capability is solely speakerphone-based. Some of the earlier models had cellular handsets, but a number of subscribers today would undoubtedly prefer the clarity and privacy of a real telephone handset. Ever tried to use a speakerphone-type device in a convertible? I have. Both of my automobiles are convertibles: one is a sports car, the other a soft-top SUV. Both have full power, hardwired cellular phones, and both have speakerphone hands-free capability. Both speakerphones are inadequate in the open environment. I'm not even referring to zipping along the freeway at 75 mph. I can't even hear or be heard while stopped in traffic at a red light. Public streets are noisy places, you will have to admit. Apparently, OnStar does not offer a handset even as an accessory or option—not even in convertibles. Go figure.

Now here's a really interesting point. You might think with all the data telemetry streaming from any OnStar equipped car to the advisors' service center that OnStar must be using a network of sophisticated digital wireless service carriers. Nope. Not at all. The fine folks at OnStar have had both the technical and the operational good sense to shun digital wireless in favor of standard AMPS cellular service. According to OnStar, "The benefits of new digital cellular technology are great, but the downside is even greater." How true! One very good reason cited is that over 90 percent of the U.S. is covered by the analog (AMPS) network, while digital coverage is less than 30 percent. They go on to cite other reasons, and I could give you several more. (For more information on the shortcomings of digital wireless technology, see this month's "Homeland Security" column.)

Since original-equipment telematic installations have to date been offered on a limited number of vehicles, and only in the last few years, most of us do not have this option available to us, even if we have a current production model car or truck. Does this mean no telematics for us? Certainly not, as regular

"O-T-G Radio" readers have already discovered. Obviously you can get a wireless phone, and many have had one for some time already. And there are a number of other products and devices that can be assembled. But let's start with the very basics. Whether or not you have a wireless phone in your vehicle or clipped to your belt, you still need CB radio. For those not into CB big time, consider something small, inexpensive, and simple. If nothing else, CB is especially good for reports of the highway conditions ahead. You may rarely lift the mic to speak, but you will find yourself listening whenever traffic slows to a crawl, or an obvious weather situation is brewing just ahead.

If you are really deep into mobile CB operating, you can go ahead and skip the next couple of paragraphs if you wish. You may not need anything small, and you sure don't want anything too simple for your operating habits. Go for a big-bucks rig! But if your primary need is highway guidance and warnings, in an unobtrusive package, I could be showing you just what you need.

Adding A RadioShack CB To Your System

The RadioShack TRC-511 Compact Mobile CB Radio provides good reception and still has full legal transmitting RF power. It fits well under many dashboards, at about 4 inches wide by 1-1/2 inches high. The body of the TRC-511 is about 6 inches deep, which makes for a really small unit, overall. This CB includes a built-in mic amplifier circuit and is controlled by a well-known industry standard CPU chip, the Sanyo 8760 series IC.

The controls are very straightforward: The TRC-511 has an on-off rotary volume control switch and a rotary squelch knob. The unit has, in addition to its up-down 40-channel rocker switch, a three-position slider switch, used to choose from among the operating frequency you enter, or channels 9 or 19. You can easily step back and forth between the three, and the present operating channel is displayed on a decent-sized, easy-to-read LED display. There's a green RX LED and a red TX LED. Other than the requisite push-to-talk switch on the mic, that's it!

The FCC Does Something Goofy...Again!

I found a wealth of information at the FCC Certification Web site by simply entering the CB set's FCC number, which is AAO 2101705 on my evaluation unit. I retrieved an explanation of the theory of operation, alignment procedure instructions, block diagrams, schematics, and a detailed photo of the well-labeled component side of the main circuit board. There's more. I also found in this literature fairly explicit instructions on how to **increase the RF power output level**, as well as and good clues to increasing the modulation level. That's right, I got all this from the FCC's own Web site! Don't ask. I only work here at *Pop'Comm*, remember? Suffice it to say that one reason I don't write fiction is that my imagination could never top the bizarre tales I regularly uncover in the real world. 'Nuff said.

There's no need to look "under the hood" of the TRC-511. It's a basic unit designed to do basic CB operations without compromise. I feel. You need a unit like this in your car, truck, or SUV regardless of whether or not you have cellular, PCS, SMR service, amateur radio, GMRS, scanners, etc. Nothing else does what a CB radio does. When you are out of range of a wireless comms network, or when all local cells' channels or landline backhaul circuits are busy, your CB will work, and on Channel

19, there will nearly always be someone to speak to if you are anywhere within a few miles of an Interstate highway.

Hams, Please Note

Here is another great idea for acquiring a TRC-511 for your base station. If you have a CB base station at all, you likely have a fairly sophisticated CB rig, to say the least. Consider adding a TRC-511 dedicated to monitoring only Channel 9 or possibly Channel 19. Remember, the TRC-511's three-position slider switch makes it easy to choose from among your own operating frequency and channels 9 or 19. If you operate a ham shack without an 11-meter radio, you ought to consider having a CB rig like this simply to monitor and respond to Channel 9 calls. Don't cry to me that CB operators don't know proper operating procedure. Get on the band and show 'em how!

Again, why spend a bundle for basic functionality? The current TRC-511 RadioShack catalog price is \$49.99. I actually purchased my evaluation unit at an advertised special price of \$24.99, and opted for a service plan agreement for only \$14.95, based on the sale price of the TRC-511. Can you top that, anywhere? My own personal experience has shown me that if RadioShack puts an item on sale fairly early in the product's life cycle, then they just might (no promises!) place it on sale again. Watch those RadioShack sales flyers whenever they come out. You may also want to check several local stores for the possibility of overstock conditions or varied sales terms. As I so often point out, you will never know what your best deal on anything is until you either look around or ask around. And please let me know what you find, if you would.

Two Neat NOAA Weather Receivers

It's also nice to get a weather report or a weather emergency alert before you hit the road. I want to tell you about two really nice and very functional NOAA weather alert desktop receivers. Both of these units come from competing manufacturers, but are quite similar in appearance and, as it turns out, in functionality and features as well. And since I'm already on a "keep it simple" bent this month, we will be looking at two low-cost receivers without NOAA's SAME geographic digital signaling mode. I truly like the SAME functionality concept for desktop and fixed base station receivers. (It's not so useful in mobile or portable operation if you stop to consider, but that's another story.) However, in keeping with the "simple" theme, I am also thinking "inexpensive." And that's always good!

I first looked at Midland Consumer Radio's Model 74-109 Weather Max Plus weather and "all-hazard" radio. This receiver picks up the seven U.S. NOAA weather channels, and its reception is crystal-controlled by a single XTAL set to WX Channel 1. The other channels are derived from separate tuning circuits connected to the XTAL circuit.

This is a handsome white light-grayish box with a top-firing speaker that sits "flat" on the desktop. It measures about 6.25 inches wide by 4.25 inches deep, and is only about 1.5 inches high. The user can select a 90-dB siren alarm, NOAA voice alert, or a visual red flashing LED. The 74-109 has an output jack for an external relay to activate auxiliary equipment during an alert. It also has an external antenna jack as well as a built-in telescoping whip antenna. It runs from 12 Vdc and includes a wall-wart adapter. It also accommodates a 9-volt backup battery for power outages. Both are very impressive features.

The top panel has large buttons for activating and resetting

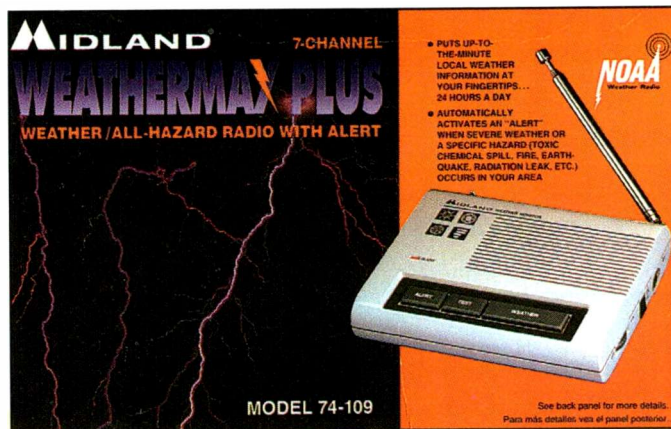
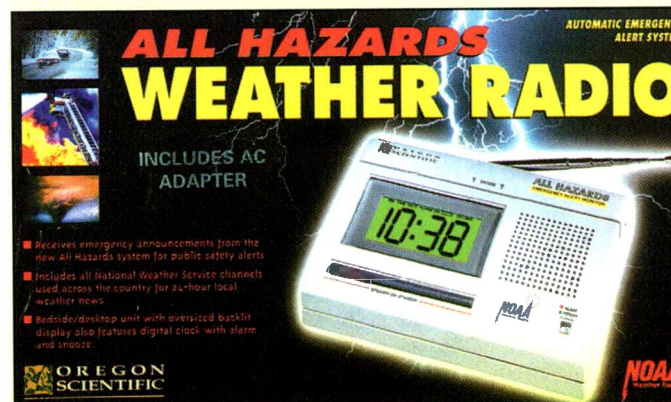


Photo of the Midland 74-109 packaged for sale. (Photo by N3HOE)



The front of the Oregon Scientific WR-3000 package. (Photo by N3HOE)

the alert function, testing the alert function, and simply monitoring NOAA Weather Radio audio at any time. The volume control is out of the way, but readily accessible on the right side of the radio. The alarm mode selection slider switch and the channel selector slide switch are on the bottom of the box, which keeps idle fingers from inadvertently changing these vital settings.

The Midland 74-109 is a nice unit that performed flawlessly in casual testing during a busy storm season. At the time of my research, the 74-109 listed at Amazon.com for \$29.95. I purchased my evaluation unit there for only \$26.99, plus shipping.

Another weather alert receiver to consider is the Oregon Scientific WR-3000. It measures about 6 inches wide by 4.5 inches deep and is housed in a light gray case. Users can select NOAA voice alert or a visual red flashing LED as alerting functions. The WR-3000 uses a telescoping whip antenna but has no jacks for an external antenna or for auxiliary alert devices. This is fine if you are in an area of adequate signal strength, as most of us are, and intend to use this receiver as a desktop-type unit only (as opposed to using a desktop WX receiver to switch on a school's PA system to transmit the warning to all in a large facility, for example).

Both this WR-3000 and the Midland 74-109 have mounting holes on the back to secure the units to any flat surface. The WR-3000 has its volume control also located on the right-hand side of the unit, but its front panel is uncluttered of controls. There is a single large "Speaker On/Standby" bar, the only obvious control. During a voice alert, a double-press of this bar resets the receiver. During a visual-only (if selected) alert, or anytime



Here is the RadioShack TRC-511 in use in the shack, left center. We told you it's small! Notice the vintage Johnson Messenger 130A, still in active service, lower right. (Photo by N3HOE)

a user wants to hear the NOAA Weather Radio broadcast, a single press of the bar opens the audio to the speaker. An additional press of the bar silences the speaker and resets the alert function. There is a top-firing speaker and a large always-on (except when running on internal battery power) backlit LCD display on the WR-3000. The LCD can be set to function as a month-date calendar or as a clock with optional alarm and snooze options. Well then, looks like the WR-3000 makes an excellent radio for the nightstand in your bedroom, too!

This Oregon Scientific receiver operates from 4.5 Vdc, and includes its own wall-wart AC adapter. It uses three C batteries as power backup. The controls for WX alarm mode, time and date settings, and WX frequency are all located not on the bottom of the radio, but are instead under a lift-up lid about a 1/2 inch deep, running the entire width of the front (upper) panel, along the back. Tuning among the seven NOAA weather channels is done by means of an analog thumb-wheel, with a tiny, good old-fashioned sliding needle indicator window. But there are no channel markings other than the upper and lower band limits, so when the receiver is put into service at any given location it must be manually tuned.

Closing the lift-up lid activates an AFC (Automatic Frequency Control) circuit to "lock in" the FM signal. Anybody remember the AFC control on old FM broadcast band receivers? If you tuned in your favorite station and didn't lock it in, it was only a matter of time before the frequency drifted off-center and your music quietly faded away. I really wasn't crazy about this antiquated and inaccurate tuning section, but throughout months of casual testing through various extended periods of storms and endless biweekly NOAA tests the WR-3000 performed flawlessly, and indeed never drifted off frequency.

I hasten to add one small qualifier though. My test location is only about three miles from the NOAA transmitter on flat terrain. Then again, the test location is in a concrete hurricane-rated structure, and the heavy steel storm shutters were closed during some of my testing.

Bottom line on WX receive and alert functionality: Both the Midland and Oregon Scientific weather alert receivers discussed here performed very well. Neither exhibited, for me, any missed alerts confirmed by simultaneous open audio signal monitoring by means of a second on-site receiver nor any false positive alerts.

I purchased my WR-3000 evaluation unit from the Cleveland, Ohio, AES (Amateur Electronic Supply) store. I paid their advertised closeout price of \$19.95, plus tax and shipping. At that time, the Oregon Scientific Web site listed the WR-3000 at \$49.95, with a discount price set at \$29.99. You know the drill: Shop around! If certain dealers or distributors are discontinuing a particular product, then prices may well be driven down, as appears to have been the case with the WR-3000. What similar products and prices can you find? If you are shopping for any of the products seen here in "O-T-G Radio," we would really like to know what you find, where you find it, and how much the vendor is asking. Please write!

Catching Up With You

"O-T-G Radio" wants to hear more from CB radio clubs, Web sites, and E-mail lists. In fact, any questions and comments regarding this column are always welcome. And *Pop'Comm* is especially interested in hearing from manufacturers and equipment distributors. You can reach me electronically at <n3hoe@juno.com>. In just the last month or so I've been

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inundated by both E-mail messages and hard-copy snail mail from our readers.

First, let me thank you, our readers, profusely for your support and suggestions for the ever-evolving "O-T-G Radio." Second, kindly allow me to confess that I am definitely a bit behind on reading and responding to all of this correspondence. Actually, much of the hard-copy mail had been received over the past couple of months at *Pop'Comm* headquarters before I took over this column. Anyway, please rest assured that I do have that mail in hand and none of it will be ignored. Unfortunately, I received the bulk of these cards and letters too late for this month's deadline, but we will jump right into selected messages to be published in "O-T-G Radio" next month. We do have some really great requests and information submitted!

There is so much more on telematics and what you might want to include in your mobile shack to be covered here at "O-T-G Radio." It seems we just can't publish it and get it out to you fast enough. Granted, it does take time, planning, and even some level of budgeting to gather up and put together information on the equipment you want, just the way you want it. So, even if armed with the nitty-gritty from this column and from your own fact-finding, you don't happen to have things together quite in time for summer travel, don't feel left out. As "O-T-G Radio" rolls out the coming months' articles, keep reading and planning. Before you know it, the fall and winter holiday travel seasons will arrive. I am convinced more folks travel more miles during the holiday period than during summer vacation trips. But that's another story for another couple of issues. We'll start right away on that next month. See you then! ■

Inside The Canadian Military Communications and Electronics Museum



The main entrance to the Military Communications and Electronics Museum in Kingston, Ontario Canada. This 10,000 sq.ft. facility was opened in 1996 and contains one of the finest collections of military and commercial radio equipment in North America.

This month's column answers that perennial asked question: What did you do during your summer vacation? In my case I visited what I believe to be one of the best military communications museums in North America. This is the Military Communications and Electronic Museum located in Kingston Ontario. While it is certainly a little out of the way, the museum contains equipment and artifacts that date back to the earliest periods of radio communications.

Not only does the museum contain a good collection of radio and electronics equipment, it is a true military museum. You will find displayed along side the hardware many excellent examples of Canadian uniforms, procedures and enlisted life. This is a very mature and professionally managed institution, having its beginnings in 1961 and having received considerable support from the military establishment, federal government and the community.

The display, archives and administrative office are located in a modern building that was open to the public in 1996. I am going to provide you with an overview of what you will find at

the museum when you go there and show you a few pictures of some of the displays that are provided.

With the cooperation of the museum staff I plan on providing a special article in 2003 on the history of the Canadian military communications to help celebrate the service's 100th anniversary. There will be several special events during that year which I will keep you apprised of, which will include a special exhibit at the museum.

In addition to this month's topic we also have reader's logs. The logs are very good as usual, with some special catches that I will point out to you. So enough of the housekeeping, let's get on to the main course.

The Military C and E Museum



A small sampling of the many fine pieces of equipment that are on display. This is the Teletype display, which is only one of many.

The city of Kingston had always been strategically important during the early days of Canada's history. It was the capital of the English speaking part of the country before Confederation in 1867 and was the center of commerce and transportation for many decades.

After the War of 1812 the area became the focus of a great deal of military activity. A large fort was built to protect an important canal system and a large militia was kept there due to the close proximity of the town to the American border.

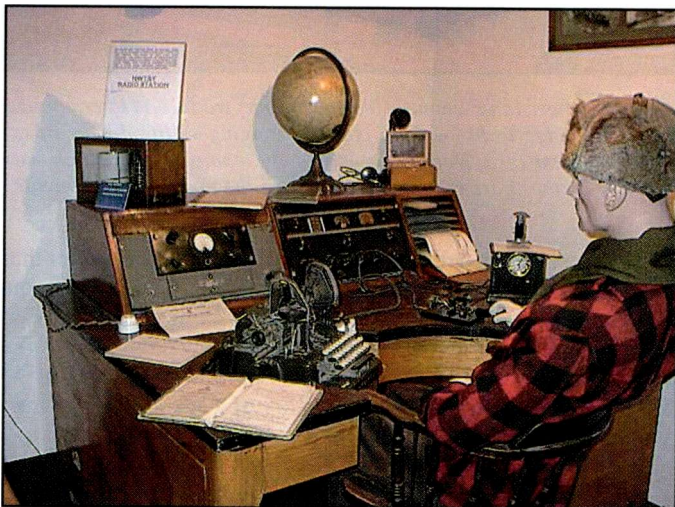
Over time the city came to be one of the important centers for training and command for the Canadian armed forces. In part due to the sense of history that the present city imparts upon the community and thanks to the strong belief in tradition found in the military, a great deal of important historic military artifacts of all types can be found in the city. This sense of history and preservation was very much part of the branches of mili-

tary service connected to communications. Many people had begun individual collections of equipment and documents from the very beginnings of radio communications and earlier. The first informal attempts to place these collections into displays took place at Royal Canadian School of Signals in 1937.

In 1961 authorization was granted to establish the Royal Canadian Corps of Signals Museum where the informal collections could be turned into a permanent public display. This museum was later changed to reflect the integrated character of the modern armed forces, so by 1976 the current name of Military Communications and Electronics Museum was established.

The current museum building was completed after two years of work and opened to the public in 1996. The funding for the building came from many sources, with much of the work in raising it having been undertaken by Colonel Arthur Child. While his efforts helped raise over \$5 million dollars, he passed away before seeing the museum open. The building is now named in his honor.

Inside The Museum



This is an example of one of the many displays showing how people would use communications equipment during different time periods. This is a display showing the radio service provided in northern Canada during the 1930's. The radio operator is not over dressed. Given the temperatures in winter, he would probably have appreciated having a radio that glows, giving off some much need heat.

The museum houses a gallery of 10,000 sq. ft. of display area, contains achieves of many documents relating to Canadian communication history, and provides office space for staff and curators. The displays contain military communications equipment and memorabilia that dates from the mid 1800 to the present.

The displays are designed to take the visitor through different time periods, explaining the events, people and technology to be found there. While all of the armed conflicts that Canada was involved in are displayed, there are many other contributions made by the military to Canadian society that are documented.

For example, during the 1920's the Royal Canadian Corps of Signals set up a signalling service using both telegraph and radio through out the northern part of the country. This is presented

in a series of interactive displays using actual equipment from the time period.

As the museum is intended to honor those who served in the many wars that Canada has been involved in during the 20th Century, there is a memorial room with an honor roll. Included there are a series of model statues that were used for the final versions now located at the Vimy Ridge memorial located at the site of that important World War I battle in France.

The displays are designed to be of interest to all age groups and a full tour takes a minimum of one hour. The building is air-conditioned and wheelchair accessible. Admission is by voluntary donation.

What You Will See



The museum covers military life in the Canadian army during many different time periods. Here is a display showing an enlisted man's kit and bed. Other displays show officer's dress uniforms, women's uniforms, and the dress used by work crews.

The displays in the museum have been organized into three main themes—the Troops, the Times, and the Technology. The intention of this approach is to help the audience understand the reasons why a particular technology was used and who was using it. This helps overcome the static nature of those displays that feature only equipment.

In order to achieve their aim the museum staff has laid out the displays by decade, starting in the mid 1800's. Written communications, semaphores, and telegraphs are featured in this area.

As the displays enter into the 20th Century some of the earliest radio equipment such as spark gap transmitters are featured. However, in times of war communications was often undertaken by any means possible. For example, in 1915 the Signal Corps was responsible for 20,000 carrier pigeons that were used in the front lines of war. Special trucks with pigeon lofts were used to ensure that the 100 plus messages a day carried by these birds were properly sent and received.

Likewise, direct wire, foot courier, and motorcycle also were undertaken as means of battlefield communications. By 1916

the first effective uses of radio began in the field, and from those early experiences the post-war radio industry was born not only in Canada, but also around the world. However, it would not be until the 1920's and '30s that radio technology would come into its own, slowly replacing many of the traditional methods of communication in use.

One of the great contributions made by the Canadian military to the country was through the application of the skills learned through research and practice to practical situations. One place that needed it the most was in the northern territories.

Given the sheer size of the land, and the great distances between settlements, telegraph systems were expensive to put up and maintain. Radio was a logical solution, and Signal Corps was called upon to set up a reliable working service.

Though a series of interactive displays you can see reproductions of the radio shacks used to maintain the North West Territories and Yukon Radio System. The actual equipment that was used is shown, along with detailed explanations as to what you are seeing and how it was used. It is interesting to note that this system was in continuous use up to 1957, when it was taken over by the Federal Government, who maintained it until 1965.

Other displays in the "Times" section show Canadian Military life and communications methods during the 1930's, World War II and well into the Cold War period. Each display shows the uniforms, activities and actual equipment in use for each of those periods.

Spies And Espionage



This display has one of the ENIGMA cipher machines used by the German military during WWII. Other examples of ciphering and deciphering equipment are displayed here.

One of the most important parts of any successful military campaign is intelligence gathering and counter espionage. This is particularly true in military communications, where secrecy and reliability is extremely important for the protection of a mission's success.

One of the most interesting displays in the museum is their cryptology section. On display here is a complete ENIGMA cipher machine, along with its history. Used by all German military forces during World War II, the early capture and breaking of the code used by the machine by the British enabled the Allies to intercept most enemy message traffic.

There is also a fascinating display on "Camp X"; the famous World War II spy school that was attended by Ian Flemming, who would use his experiences there as the foundation for his "James Bond" character and books. While nothing exists today at the site of the school, a number of artifacts from that time are on display, including the picture of a building used in the training of spying and sabotage techniques.



Camp X, where Ian Flemming learned the spy trade, and later applied that knowledge to his writing career, bringing to life James Bond, Special Agent 007. Nothing is left of the camp today, which was located on the shore of Lake Ontario near the town of Bowmanville.

Of interest is an actual example of a suitcase transceiver that would be used by a spy to transmit information back to the home base or country. Other artefacts of the spy game are also on display, such as a miniature camera and operations dagger. As the display states clearly, the motto of Camp X was "Kill or be killed", underscoring the brutal reality of a spy's life once they were behind enemy lines.

What Else Is On Display

In addition to the interactive historic displays, there are also many pieces of technology on view. The museum has an

Looking into the interior of a truck - based mobile radio unit. There was everything but air conditioning in the module. The only ventilation was the holes above the operator's head (which were covered to keep the rain out). It must have been very hot and noisy in there, especially when the mechanical teletype machines were working full blast.



impressive number of communications trucks, Teletype machines, and military radios on view. These displays also include over 100 years of telephone equipment, historic radar and computers, as well as demonstrations of modern technology such as the Internet.

For those who are interested in military history, there are numerous displays of period uniforms and insignias from many different branches of service. The role of women in both direct service and support roles is also covered in the displays.

If you're an amateur radio operator, and remember to bring a copy of your current station license with you, you may use the facilities of ARS VE3RCS. The station features both modern and military radio equipment, with the latter being a complete field unit that has been fully restored to its original operating condition.

If you come to the museum during the week, and have made prior arrangements, there is an archive and reading room containing an extensive collection of material on military communications in Canada. If you are either an amateur or professional historian, the staff and curator of the museum will be more than happy to help you research relevant topics for articles or academic work.

Likewise, the museum also has an excellent souvenir and gift shop that contains a wide variety of useful items to choose from. This includes a number of memorabilia items as well as a good selection of books on a wide range of historic and contemporary topics on Canadian military subjects.

How To Get There

The Military Communications and Electronics Museum is located roughly five miles east of the city of Kingston Ontario on HWY 2, opposite the Vimy Barracks of the Canadian Armed Forces. They are open 8 am to 4 pm Monday to Friday year round. During weekends and holidays during the summer months they are open 11 am to 5 pm. Other times can be arranged by appointment. Parking is free, the admission is by donation, and the building is wheelchair accessible.

While close to the American border, the city of Kingston does not have an international airport, with the closest being the city of Ottawa, roughly two hours away by car or bus. Those driving to the city from the United States can use route 81 that travels north from Syracuse New York.

Kingston is a modern city with an historic past. There is a large tourist industry in the city, with the downtown area having many excellent restaurants and hotels. The city is located on the banks of the St. Lawrence River, and there are many water-based attractions, such as tours of the Thousand Islands. Expenses are reasonable, particularly due to the high exchange rate of the American dollar. You may also want to consider a side trip to Ottawa, Canada's capital city, which also contains many excellent military and aviation museums.

For more information about the museum you can call them at 613-541-5395. Their email is staff@c-and-e-museum.org, and their website is www.c-and-e-museum.org.

I would like to thank Doug R. Hildebrand, the curator of the museum and his staff for the assistance and cooperation that they provided in putting together the material for this column.

Reader's Logs

We have the usual (but always appreciated) collection of logs this month. I'd like to welcome new contributor Robert C.

Williams, Sr. who is with the U.S. military working out of Yokota AB at Tokyo Japan. Likewise contributor Richard Monjour is providing us with a group of logs that he made while on vacation in Europe.

There is still a lot of action on the air, with some exciting coast guard search and rescue activity-taking place in the Gulf of Mexico and Caribbean. Also check on **8443.5 KHz** and you will see an interesting log for the British Naval signal school 100th anniversary special event broadcast.

Far from being strictly routine, the traffic being sent and received through ute services are still very active and interesting, to say the least.

Remember that all frequencies are in Kilohertz and times are Universal (Z).

0000: STATION, Anytown, USA, summary of traffic heard in MODE at 0000 Z (Z), personal comments here (JC)

68: GBY20, UKSUBCAMS RTTY//50/N/85 Marker "NAWS POF001" every two minutes thru 1050z. 1252z Welcome svc to HSWMS Halland (rptd) until 1258z (goes idle). 1314z returns to 2-minute marker. (DW)

122.3: UNID, DN AARHUS, RTTY//50/N/85, Tfc for HSWMS Vaestergotland in respect Exercise Sorbet Royal 2002. (DW)

141.4: UNID, DN AARHUS RTTY//50/N/85 Tfc for HSWMS Vaestergotland in respect Exercise Sorbet Royal 2002. Broadcast D32. Poor copy. (DW)

514.5: IPB, Bari Radio, Italy. Sending WX, NTM, TTT, etc continuously, all day long. (RM)

980.0: RFFXC, Paris, France 20.55 ARQ-E 184.6/400 5-Ig tfc to RFFXCKO, Kumanovo (or Kosovo, it has been used for both) on RTC cct. (PT)

2187.5: UNID, GMDSS ALERT CHANNEL, DSC//100/E/170, 73 pkts in 3 hrs. No Distress/urgency. 46 Safety/test/announcement safety bcast. 27 illegals. C/stns logged - Ijmuiden Bilbao Lyngby Aberdeen Clyde Corunna Stockholm Shetland. (DW)

2461.5: 0a, Irish Navy Haulbowline, SITOR/A//100/E/170, Wx fest. Fading/occ dropout. (DW)

2461.5: 86, Irish w/ship, SITOR/A//100/E/170, Selcals CVVD. "76 de 86 int qrv." 1938 selcals XSFC "oa de 86" and opchat re relay wx to 76. (DW)

3850: Berlin, German Fed Police Berlin, MIL.STD 188-141A, ALE on USB. Sounding. (DW)

3850: Muenche, German Fed Police Berlin MIL.STD 188-141A ALE on USB. Sounding. Also 2232. (DW)

4207.5: UNID, GMDSS ALERT CHANNEL, DSC//100/E/170, 5 pkts in 2 hrs. All Safety/TEST. Cstns logged - Lyngby. (DW)

4391: Unid Strange station sends a series of numbers every 45 seconds and seems to be counting up. "992200 ??8?????" then "992201 ??8?????" (actual question marks sent). This went on for hours. (RM)

4537.5: Berlin, German Fed Police Berlin, MIL.STD 188-141A, ALE on USB. Sounding. Also 2104 2204. (DW)

4537.5: Muenche, German Federal Police Munich, MIL.STD 188-141A, ALE on USB. Sounding. Also 2232. (DW)

4601.5: 0A, Irish Navy Haulbowline, SITOR/A//100/E/170, Opchat then tfc in offline encrypt. s/off. Selcals CVVD, "de 0a have 1 for u". Tfc in offline encrypt. (DW)

4879.5: Berlin, German Fed Police Berlin, MIL.STD 188-141A, ALE on USB. Sounding. Also 2103 2204. (DW)

4879.5: Muenche, German Fed Police Munich, MIL.STD 188-141A ALE on USB. Sounding. Also 2132 2231. (DW)

5100: AXM32, CANBERRA MET, FAX//120/576/N/800, Vague pix in noise. Analysis for Indian Ocean. (DW)

5115: BU1, Romanian MIL/MOI Bucharest MIL.STD 188-141A ALE on USB. CIng SMA/Satu Mari. (DW)

5120: OWE, DAF KARUP, MIL.STD 188-141A, ALE on USB. CIng OWK/Vedbaek. (DW)

5120: OWD, DAF Vaerlose, MIL.STD 188-141A, ALE on USB. CIng ? (DW)

- 5120:** OWK, DAF VEDBAEK, MIL.STD 188-141A, ALE on USB. Cng ? (DW)
- 5120:** OWP, DAF ?LOC MIL.STD 188-141A ALE on USB. Cng OWK/Vedbaek. Also at 2009. (DW)
- 5159:** 4XZ, IN HAIFA CW Marker "vvv de 4XZ ==". (DW)
- 5159:** 4XZ Israel with channel marker. (RM)
- 5255.5:** 0a, Irish Navy Haulbowline, SITOR/A//100/E/170 "rgf handing over, call u bk in 5 ok". 1'926 selcals CVVO "de 0a int qsy F2 F2 pse". (DW)
- 5255.5:** 76, Irish w/ship, SITOR/A//100/E/170 Cls "0a". (DW)
- 5257.4:** FDI8, FAF NICE RTTY//50/N/400 Marker "test de FDI8 voyez le brick figs ry's". (DW)
- 5337.4:** FDI8, FAF NICE CW Marker "vvv de FDI8 ar". (DW)
- 5696:** CAMSLANT Chesapeake w/ SEA-HAWK 02 flt ops and pos. rpt Sigs F/R. (DS2 WI)
- 5696:** Group Astoria w/ CG Rescue 6030. flt ops and pos rpt. Astoria asking for POB on overturned vessel. 6030 requests QSY to VHF 23A. (DS2 WI)
- 5696:** CAMSLANT Chesapeake w/ SEA-HAWK 02 flt ops and pos. rpt Sigs F/R. (DS2 WI)
- 5696:** Group Astoria w/ CG Rescue 6030. flt ops and pos rpt. Astoria asking for POB on overturned vessel. 6030 requests QSY to VHF 23A. (DS2 WI)
- 6269:** UGEM STR Sargal 1149 ARQ msgs to Vladivostok. (ML)
- 6312:** UNID, GMDSS ALERT CHANNEL, DSC//100/E/170 3 pkts in 2 hrs 20 min. All safety/test. C/stns logged - Lyngby. (DW)
- 6379.1:** 4XZ Israel. (RM)
- 6739:** Architect at 1900 in USB, wkg w/Ascort 9107. (SK)
- 6890:** Berlin, German Fed Police Berlin, MIL.STD 188-141A ALE on USB. Sounding. Also 2103 2203. (DW)
- 6890:** Muenche, German Fed Police Munich, MIL.STD 188-141A ALE on USB. Sounding. Also 2131 2230. (DW)
- 6912:** YL/EE with "CIO2" twice, followed by one minute of silence, "CIO2" twice again, one minute of silence again, then repeated "CIO2" continuously for five minutes, then off. USB from 0043-0050Z. (CG)
- 6985.7:** 1YP2, Baumholder, Germany 09.00 Packet CE2002 British NCS working GB11, British "home" team in northern Germany, and DE12, Denmark???. Signal too poor for most of day (17May02). (PT)
- 7597:** Berlin, German Fed Police Berlin, MIL.STD 188-141A ALE on USB. Sounding. Also 2102 2202. (DW)
- 7597:** Muenche, German Fed Police Munich, MIL.STD 188-141A ALE on USB. Sounding. Also 2130. (DW)
- 7611:** FAADCA, US FAA Washington DC 0125 MIL-STD 188-141A/USB clg FAASO: FAA EOC Ft Worth in ALE and voice. DCA identified herself as KEM80, while ASO was identified as K??71 (I missed the middle two letters). (MADX)
- 7661:** V6P, Swiss DIPLO, ?LOC MIL.STD 188-141A ALE on USB. Partially corrupt or link protected. Followed by Mil.Std 188-110A, B/I 600S 600L 300L, lead ins ".q". Then further linkprtd ALE. (DW)
- 8004:** UNID CW, Tfc in five ltr grps ending "= 983 k." (DW)
- 8021:** BMLV2: Austrian MOD, MIL.STD 188-141A ALE on USB. Cng NETZ2. (DW)
- 8040:** GYA, RN Northwood FAX//120/576/N/800 Spot winds 850mb chart. (DW)
- 8060:** PAR, Rockwell-Collins Paris MIL. STD 188-141A ALE on USB. Sounding. Also 1909z. (DW)
- 8094.5:** FDC, FAF METZ CW Marker "VVV de FDC AR." (DW)
- 8100:** BB2, Israeli AF ?LOC MIL.STD 188-141A, ALE on USB. Sounding. Also 1739z. (DW)
- 8103:** 4XZ, IN HAIFA, CW Marker "VVV de 4XZ ==". (DW)
- 8132:** Berlin, German Fed Police Berlin, MIL.STD 188-141A ALE on USB. Sounding. Also 2102, 2202. (DW)
- 8132:** Meunche, German Fed Police Munich, MIL.STD 188-141A, ALE on USB. Sounding. Also 2130, 2230. (DW)
- 8165:** RSMUNIC, R+S Munich, MIL.STD 188-141A, ALE on USB. Sounding. (DW)
- 8165:** 4300, UNID, MIL.STD 188-141A, ALE on USB. Sounding. (DW)
- 8165:** 4000, UNID, MIL.STD 188-141A, ALE on USB. Cng 4300. (DW)
- 8168.7:** BE20, Baumholder, Germany(?) 15.25 Packet Belgian network control station for CE2002 working NATO23 and CZ27. Advises that he is linked to the main ground network by VHF. (PT)
- 8194:** FDG, FAF BORDEAUX, RTTY//50/R/170 Marker "test2FDGvoyezlebrixkfigs RYs" and no int/char spaces. (DW)
- 8334:** 2222, Moroccan Army ?LOC MIL. STD 188-141A, ALE on USB. Sounding. (DW)
- 8335.5:** DHJ-59, (German Navy, Wilhelmshaven): 0040 USB w/DRAU (FGS KOELN, FRIGATE 122 CLASS, F-211) in EE servicing of RTTY traffic. (RP)
- 8392.5:** UDEW, Ship AKADEMIK PUSTOVOYT, SITOR/A//100/E/170 Tfc to Novorossiysk/UFN. (DW)
- 8414.5:** UNID, GMDSS ALERT CHANNEL, DSC//100/E/170 24 pkts in 2 hrs. Distress/urgency nil. Corrupt 2. Safety.test 16. Illegals 6. Logged c/stns - Lyngby, Capetown. (DW)
- 8418:** IAR, Rome Radio, CW Chan free marker "IAR." (DW)
- 8420.5:** HEC, Bern Radio, CW Chan free marker "HEC." (DW)
- 8421:** WLO, Mobile AL with SITOR and CW ID, 2313Z. Also on 8419 at 2316Z. (CG)
- 8421.5:** LZW, Varna Radio Bulgaria with SITOR and CW ID, 2314Z. (CG)
- 8421.5:** LZW4, VARNA RADIO, CW Chan free marker "de LZW LZW." (DW)
- 8424:** SVU, Athens Greece with CW beacon at 2320Z. (CG)
- 8424:** SVO, Olympia Radio, CW Chan free marker "de SVO." (DW)
- 8425.5:** HEC, Bern Radio, CW Chan free marker "HE." (DW)
- 8428:** NMN, USCG Portsmouth VA with SITOR and CW ID at 2325Z. (CG)
- 8429.5:** IDR4, in Rome, RTTY//75/N/850 CARB. Channel IDR3 active, wkg Canadian w/ship. (DW)
- 8431:** TAH, Istanbul Radio CW Chan free marker "TAH." (DW)
- 8431.5:** UAT, Moscow Radio CW Chan free marker "de UAT." (DW)
- 8432.5:** UFN, Novorossiysk Radio CW Chan free marker "UFN." (DW)
- 8433:** RRR34, Moscow Radio CW Chan free marker "RRR34" - perm change from 8430 kHz or setting error. (DW)
- 8434:** TAH, Istanbul Radio CW Chan free marker "TAH." (DW)
- 8435.5:** OST, Oostende Radio Belgium with SITOR and CW ID at 2328Z. (CG)
- 8435.5:** OST, Oostende Radio CW Chan free marker "OST." (DW)
- 8439:** PBC38, DN Goerre Island ISLAND RTTY//75/N/850 CARB. Channel 12b active. (DW)
- 8443.5:** DHJ61, GN FLENSBURG MUERWIK CW Rpts of "de DHJ61 grx hplu 20 English qtc at 22 wpm". 1520z bulletins in English thru 1557z. Naval signal school 100th anniversary special event broadcast. (DW)
- 8448:** A9M, Hamala Radio Bahrain, calling CQ in CW at 2333Z. (CG)
- 8453:** FUG, FN LA REGINE, RTTY//75/N/850 Marker "FAA de FUG ry's sg's figs." (DW)
- 8551:** CTP, PN Lisbon RTTY//75/N/850 Marker "NAWS de CTP QSX 04 08 12 16 MHz ar." (DW)
- 8573:** CLA, Havana Cuba calling CQ and "QX C/118368/12552/1673/TX 8573 QSW CLA 20QRJ C/1217 k" in CW at 2355Z. Also on 8496 at 2339Z. (CG)
- 8597:** HEC, GW NODE BERN, CW Chan free marker (Globe Wireless "HEC"). Wkg ship in Globedata on 8346. (DW)
- 8638.5:** DAO8, KIEL MAIL, CW Continuous test bursts with CW ID "cq de DAO8" every 3 mins. (DW)
- 8640.3:** MGJ, RN FASLANE, VFT// 4 chan vft on USB. (DW)
- 8642.1:** MGJ, RN FASLANE, RTTY//75/N/340 CARB. Chan 3 in vft. Channels 02q 03p 08p active. (DW)
- 8661.4:** VCT, GW NODE TORS COVE, CW, Chan free marker (Globe Wireless) "VCT". Wrkg ship in Globe data. 8614.5 (DW)
- 8662:** TAH, Istanbul Radio. CW, Marker "cq de TAH QSX 4 8 and 12 MHz ch3/4/8 k" (DW)
- 8662:** IAR, Rome Radio, CW, Marker "vvv de IAR k 4 8 12 16 22 MHz = we lsn 22 and reply on 17206.1 kh" (DW)
- 8670:** IAR, Rome Italy with CW beacon. Gave "listen" and "reply" frequencies. 0008Z (CG)
- 8683.5:** LFI, ROGALAND RADIO CW, Chan free marker (Globe Wireless) "LFI". Wrkg ships in Globedata on 8349 kHz. (DW)
- 8698:** 7TF6, BOUFARIK RADIO, CW, Marker "cq de 7TF qsx 8367/367.5/368/369 khz tks k" (DW)

- 8698:** 7TF Boufarik Radio, Algiers. With call channel series wheel. (RM)
- 8705.5:** LFI, GW NODE RO GALAND, CW Chan free marker (Globe Wireless) "LFI". qsx 8317.5 khz. (DW)
- 8711:** CYP, UK MIL/DIPLO Cyprus, MIL.STD 188-141A ALE on USB. Sounding. (DW)
- 8711:** HFB, UK MIL/DIPLO Hereford ?, MIL.STD 188-141A ALE on USB. Sounding. (DW)
- 8753.4:** ZLA, GW NODE AWANUI: CW, Chan free marker (Globe Wireless) "ZLA". Just audible. Wkng ship in Globedata on 8229.4 (DW)
- 8834:** 008, ARINC Johannesburg, HFDL// on USB. Squitters (DW)
- 8912:** CSI, US CUSTOMS ?LOC MIL.STD 188-141A ALE on USB. Sounding (DW)
- 8942:** 007, ARINC SHANNON, HFDL// on USB. Squitters (DW)
- 8942:** UNID, FLIGHT LH8265, HFDL// on USB. Air posn 28.7N 20.7W (DW)
- 8965:** CRONPR, USAF CROUGHTON MIL.STD 188-141A ALE on USB. Sounding (DW)
- 8977:** 003, ARINC REYKJAVICK HFDL// on USB. Squitters (DW)
- 8977:** UNID, FLIGHT CO0046, HFDL// on USB. Air posn 52.3N 14.10W. 0829z 52.16N 13.5W. 0835z 52.28N 11.59W. 0845 52.52N 9.46W (DW)
- 8977:** UNID, FLIGHT LH8440, HFDL// on USB. Air posn 54.48N 7.59E. (DW)
- 8983:** CAMSLANT Cheesepeake wrking numerous aircraft at half past the hour w/ flt ops and pos rpts. Acrft included CG 2114, 2102, 1504, 1708, and K5Y (DS2 W1)
- 8983:** CAMSLANT Cheesepeake wrking CG Rescue 1713 (DS2 W1)
- 8983:** CAMSLANT Cheesepeake wrking numerous acrcft at half past the hour w/ flt ops and pos rpts. Acrft included CG 2114, 2102, 1504, 1708, and K5Y (DS2 W1)
- 8983:** CAMSLANT Cheesepeake wrking CG Rescue 1713 (DS2 W1)
- 8992:** AirEvac 7R3 pp/with Mildenhall Metro then pp's to Ramstien OP's and Mildenhall OP's via Andrews. Trying to find parking. (DS2 W1)
- 8992:** KINGCRAB calling Mainsail. No stations responded. G/R here (DS2 W1)
- 8992:** KINGCRAB calling Mainsail. No stations responded. G/R here (DS2 W1)
- 8992:** Reach 29 calling Hickam no joy USB 1250 (RCWS)
- 8992:** Petro 81 with P/P to Command Post at Anderson Guam via Elmendorf. Gave arrival time then p/p to METRO. USB 1302-1308 (RCWS)
- 9025:** PLA, USAF LAJES, MIL.STD 188-141A ALE on USB. (DW)
- 9031:** Architect at 1838 in USB, RAF Upavon wkg w/CWL85 (SK)
- 9031:** Architect at 1842 in USB, wkg w/Ascott 9252 (SK)
- 9050:** PAR, Rockwell-Collins Paris, MIL.STD 188-141A ALE on USB. Sounding. Also 1810 (DW)
- 9122.7:** 6NF4, CE2002 NET AX25//300/-/200 Exchanged sigs with 2BS5. Mention of 80/40/20 Clover frequencies (rest always garbled). (J2b/9121USB?) Also Calls to BEACON. "2BS5 de 6NF4(Belgium)". (DW)
- 9122.7:** 2BS5, CE2002 NET AX25//300/-/200 Exchanged signals with 6NF4. Also calls to BEACON. 1627 "de 2BS5(Belgium NCS) (DW)
- 9122.7:** 2BS5, Baumholder, Germany 09.40 Packet CE2002 Belgian NCS working, among others, EE45 - Estonia, UA32 - Ukraine and NATO23 - in Italy(?????) (PT)
- 9157:** HEC, GW Nodebern CW Chan free marker (Globe Wireless) "HEC". Wkng ship in Globedata on 9064. (DW)
- 9187:** HEC, UNID Swiss DIPLO? MIL.STD 188-141A Ink prtd ALE on USB. (DW)
- 9212:** ALE on USB. CIng NOMADE8. Also at 1857 1904 1905 1914 1915 (DW)
- 9212:** NOMADE8, ROHDE+SCHWARZ NET MIL.STD 188-141A ALE on USB. CIng NOMADE2. Also at 1858 (DW)
- 9212:** NOMADE, ROHDE+SCHWARZ NET MIL.STD 188-141A ALE on USB. CIng NOM [AMD].....8FAADE8@ (DW)
- 9227:** AA1, Israeli AF ?LOC MIL.STD 188-141A ALE at USB. Sounding. Also 1933 2005 2034 (DW)
- 9259:** FRANCEV, Gabon Railways Franceville MIL.STD 188-141A ALE on USB. Sounding (DW)
- 9259:** Mboungou, Gabon Railways Mboungou MIL.STD 188-141A ALE on USB. Sounding (DW)
- 9304.5:** FDC, FAF METZ CW Marker "VVV de FDC AR" (DW)
- 10096:** Recife (MWARASAM-2), 0222 USB w/N520W in position report and flight route change. Sets secondary freq as 13357. (RP)
- 10190:** UNID, MIL.STD 188-110A on USB. Burst mode, var br/intlv 300S/600S/2400L, lead in ".q". On line encrypted. ALE, linkprotected, no decode, only [CMD] strings. Again tfc in psk. (DW)
- 10192:** DHJ-59, 0045 USB w/DRAK (FGS MECKLENBURG-VORP. FRIGATE 123 CLASS F-218) in EE & GE servicing of RTTY traffic. DRAK is participating in the German Navy exercise DESEX 2002. (RP) Jaws 51: 0110 USB w/Emerald Ops in radio checks and establishing this freq as primary. (RP)
- 10200:** PAR, Rockwell-Collins Paris MIL.STD 188-141A ALE on USB. Sounding. (DW)
- 10215:** HZN48, JEDDAH MET RTTY// 100R/850 Met tfc (DW)
- 10272.5:** Berlin, German Fed Police Berlin MIL.STD 188-141A ALE on USB. Sounding. Also 2202 (DW)
- 10272.5:** Muenche, German Fed Police Munich MIL.STD 188-141A ALE on USB. Sounding. Also 2129 2229 (DW)
- 10306:** UNID, CZECH DIPLO? LOC MIL.STD 188-110A on USB. Encrypted tfc. 1200/2400bps/ short intlv. Lead in "BCDE...."Variable copy. Voice coordination after tfc. (DW)
- 10392:** DKL, UK MIL/DIPLO DHEKELIA MIL.STD 188-141A ALE on USB. Sounding. (DW)
- 10392:** PRI, UK MIL/DIPLO PRISTINA MIL.STD 188-141A ALE on USB. Sounding. (DW)
- 10416:** LN2A, SEIVO BEACON on USB. F1b 850Hz bursts at 2210Hz, CW ID at +2635Hz. Rffair 1919 (DW)
- 10626:** RFFXL FF NAQOURA ARQ/E//184.5/1/400 8rc. Betas. No app tfc thru 2359z (DW)
- 10638.7:** Un-ID, Loc unknown 20.54 ARQ-M2 200/400 Idling and shuts down at about 21.00. (PT)
- 10658:** 1090, RED CRESCENT ?LOC, MIL.STD 188-141A ALE on USB. Sounding. (DW)
- 10715:** UNID, Chinese DIPLO MIL.STD 188-110A on USB. End of msg, no sync. 1937 ALE burst YT315A cIng ZT201A (DW)
- 10814.2:** RFQP, Djibouti 18.40 ARQ-M2 200/400 Ch.A: Svc + 5lg tfc to RFFTACS on QPB cct to Paris (14May02). (PT)
- 11003.3:** D31, Danish Mil? 18.25 MIL-STD 188-141A/PACTOR Initially caught end of Pactor QSO. Overnight saw D31 call 60, KFO (Danish KFOR contingent?) and 71S call 79V. Only Pactor observed since is un-id calling D85M5S (PT)
- 11023:** Un-ID, Ukraine??? 18.35 ITA2 50/170 Encryption after ++++++. Message header has cct UTS and timestamp is GMT+3. Could UTS be Ukraine callsign? (PT)
- 11030:** AXM34 Canberra MET, FAX// 120/576/N/800 Grainy. Tasmania.NZ, then end of pix (DW)
- 11039:** DDH9, Hamburg MET RTTY// 50/N/440 Forecasts (DW)
- 11086.5:** GYA, RN Northwppd FAX// 120/576/N/800 End of poor visibility prog chart. Grainy (DW)
- 11103.2:** 3A17, Baumholder, Germany 10.15 Packet CE2002 French NCS working, among others, HU25 - Nagytarcsa, Hungary, AT53 - Vienna, SK13 - Svolen, Slovakia, IT24 - Verona. (PT)
- 11145:** LFI, GW NODE RO GALAND CW Chan free marker (Globe Wireless) "LFI". Wkng ship in Globedata, QSX 10415 kHz. (DW)
- 11175:** KINGCRAB wrking Offutt setting up pp. G/R (DS2 W1)
- 11175:** REACH 73Y requesting and receiving WX rpt from Incrilik via pp thru Croughton. Sigs F/R here (DS2 W1)
- 11175:** Unid station sending SKYKING msg. Op had British accent. (DS2 W1)
- 11175:** KINGCRAB wrking Offutt setting up pp. G/R (DS2 W1)
- 11175:** REACH 73Y requesting and receiving WX rpt from Incrilik via pp thru Croughton. Sigs F/R here (DS2 W1)
- 11175:** Unid station sending SKYKING msg. Op had British accent. (DS2 W1)
- 11175:** 653Tango to 65 working maintenance problem (lost temp control) USB 1330-1342 (RCWS)

11175: Sierra 6 Delta calling Anderson Global. No joy. USB 1257-1301. (thick accent, possibly from the Philippines) (RCWS)

11175: Kanto 93 with P/P via Diego Garcia no answer at phone #. USB 1301-1303 (RCWS)

11175: Kanto 93 with p/p to Kadena via Yokota with landing ETA and pertinent info then p/p to METRO. USB 1325-1331 (RCWS)

11184: 003, ARINC REYKJAVIK HFDL// on USB. Squitters. (DW)

11184: UNID, FLIGHT AY2161 HFDL// on USB. Air psn 58.35N 19.22E. 1542z 58.12N 18.31E (DW)

11184: UNID, FLIGHT LH8272 HFDL// on USB. Aor posn 47.11N 0.58W (DW)

11186: Keep Track (unidentified), 0111 USB w/Polar Bear 801 (probable P-3C) who reports he is Excursion at (encoded time) and that call-sign W9F has his comm guard. (RP)

11226: 280053, USAF MIL.STD 188-141A ALE on USB. Clog CRO/Croughton (DW)

11226: CRO, USAF Croughton, MIL.STD 188-141A ALE on USB. Sounding.. 2135 clog 280(280053). 2202 sounding. (DW)

11226: PLA, USAF LAJES, MIL.STD 188-141A ALE on USB. Sounding. (DW)

11232: CANFORCE 339 w/ Winnipeg OPs via pp Trenton Military. Rptng RTB in 30 mins with jumpers. Sigs G/R. (DS2 WI)

11232: CANFORCE 41 w/ Trenton Military Receiving sports scores and WX rpt. Sigs L/C. (DS2 WI)

11232: RAZOR 33 w/ Travis via pp Trenton Military. Asking for WX at Robbins AFB. Sigs G/R. (DS2 WI)

11232: CANFORCE 339 w/ Winnipeg OPs via pp Trenton Military. Rptng RTB in 30 mins with jumpers. Sigs G/R. (DS2 WI)

11232: CANFORCE 41 w/ Trenton Military Receiving sports scores and WX rpt. Sigs L/C. (DS2 WI)

11232: RAZOR 33 w/ Travis via pp Trenton Military. Asking for WX at Robbins AFB. Sigs G/R (DS2 WI)

11288: Saudi Operations (O/M Arabic), 0203 USB w/unidentified aircraft (O/M Arabic) in pp w/O/M (Arabic) (RP)

11345: Stockholm Radio, 2301 USB w/Nigerian 8057 (id as B-762-600) in position report and selcal check (BQ-?F?K). (RP)

11384: 007, ARINC SHANNON HFDL// on USB. Squitters (DW)

11387: Sydney, 1201 USB w/automated voice volmet. (RP)

11416.7: RFFVAY, FF SARAJEVO, ARQ/342//200/E/400 8rc, 2 chan tdm. Chans A: B: betas. No app tfc thru 1750z (DW)

11475: TRP, Algerian EMB TRIPOLI MIL.STD 188-141A ALE on USB. Clog MAE/Algiers. (DW)

11475: TNS, Algerian EMB TUNIS MIL.STD 188-141A ALE on USB. Clog MAE/Algiers. (DW)

11475: MAE, MFA Algiers MIL.STD 188-141A ALE on USB. Clog Tunis/TNS. (DW)

11475: MAE, MFA Algiers MIL.STD 188-141A ALE on USB. Sounding. Also 1409z. (DW)

11491.8: RSMUNIC, ROHDE + SWARZ Munich MIL.STD 188-141A ale on USB. Sounding. (DW)

11495: 0001262, Iranian NET ?, MIL.STD 188-141A ale on USB. Sounding. (DW)

11518.2: UNID, FF Paris ?, ARQ/342//200/E/400 8rc. 2 chan tdm. A: B: betas. Poor signal/sync thru 1757. No app tfc. (DW)

11536: HMF49, KCNA PYONGYANG RTTY//50/N/250 Press - references to DPRK. 1412z "qrx sk." (DW)

11572: RFFXCFA, Ukraine 20.50 ARQ-E 184.6/400 2nd Armoured Brigade with svc tfc to RFFXCCS, Paris, on UAF cct (14May02). (PT)

11890: DG, Moroccan MOI ?LOC MIL.STD 188-141A ale on LSB. Sounding. Also at 1854, 1923. (DW)

12113.7: UNID, MFA Cairo SITOR/A//100/E/170 Selcals TVVC/Baghdad, then into betas, finally opchat in AA(ATU80) and s/off 1304z. (DW)

12166.2: 41W9, Baumholder, Germany 09.20 Packet CE2002 Irish NCS working, among others, ES21 - Spain, GR26 - Athens, LT44 - Lithuania. (PT)

12216: 68, Danish Army ?LOC MIL.STD 188-141A ALE on USB. Clog 28. (DW)

12410: DHJ61, GN Flensburg MUERWIK CW Bulletin in German. Naval Signal School 100th anniversary special event broadcast. (DW)

12489: UDRE TH Boris Lavrov 0953 ARQ svc msg to Vladivostok. (ML)

12510: 9HJM6 M/V Sasha 1153 ARQ op chat to Vladivostok & UFZ DE 9HJM6 log off. (ML)

12510: UCZT TR Iktus 1115 ARQ w/KYPS selcal, 54110 UCZT log on & msg to Vladivostok. (ML)

12510: UEKB PB Viktoriya 1104 ARQ tfc to Vladivostok, DE UEKB log off. (ML)

12510: UFAF TH Sviatitel Innokentij 1133 ARQ msg to Vladivostok, DE UFAF log on. (ML)

12566.5: UNID, SHIP UNID, 3SC//50/R/170 Tfc in 3SC. End of msg. (DW)

12568: UNID, SHIP UNID, 3SC//50/R/170 Tfc in 3SC. End of msg. (DW)

12568: UAAP M/V Kapitan Morgun 0807 RTTY 50/170 clog Murmansk UDK-2 DE UAAP to tfc. (ML)

12570: UEKK STR Sakrama 1006 ARQ crew msgs to Vladivostok. (ML)

12570: UIBA BMRT Otol 1055 ARQ msgs to Vladivostok, DE UIBA BMRT Otol log on/off (ML)

12570: UIMG TH Otomar Ochkaln 1038 ARQ tfc to Vladivostok (ML)

12572.5: UAVH BMRT Viktor Miranov 0752 RTTY 50/170 w/Ry's DE UAVH to tfc to unknwn (ML)

12577: —, GMDSS ALERT CHANNEL DSC//100/E/170 86 pkts in 3.4 hrs. Distress/urgency nil. 69 Safety/test. 17 illegals. Logged c/stns - Perth, Madrid, Lyngby, Boston. (DW)

12740: ZLA, GW NODE AWANUI CW Chan free marker (Globe Wireless) "ZLA". Wkng ship in Globedata on 12430. (DW)

12840.5: PBC312 DN Goeree Island RTTY//75/N/850 CARB. Channel 16a active. (DW)

12955: UFL Vladivostok rdo 1010 FEC wkg freqs for ARQ ops. (ML)

12987: UNID station sending "VVV VVV VVV 1/2 P50 P50 () 7CE 7CE V 7CA 7CA () () () ()". (RM)

13002: HEC, GW NODE BERN CW Chan free marker "HEC." (DW)

13015.5: IAR, Rome Radio CW Marker "vvv de IAR k 4 8 12 16 22 mhz = we lsn 22 and reply on 17206.1 kHz." (DW)

13031.2: FUF, FN FT DE France RTTY//75/R/850 Marker "FAA de FUF testing ry's sig's figs testing." (DW)

13032: SPB63, SZCZECIN RADIO CW Chan free marker "SPB." (DW)

13033.5: VCS, GW Node Halifax CW Chan free marker (Globe Wireless) "VCS". Wkng ship in Globedata on 12463 kHz. (DW)

13036.5: KFS, GW NODE SNA FRANCISCO CW Chan free marker (Globe Wireless) "KFS". Wkng ship in Globedata. QSX 12460 kHz. (DW)

13123.4: LSD836, GW Node Argentina CW Chan free marker (Globe Wireless) "LSD836." (DW)

13147: ZLA, GW Node Awanui CW Chan free marker (Globe Wireless) "ZLA". Wkng ship in Globedata on 12300.4. (DW)

13162.4: VCT, GW Node Newfoundland CW Chan free marker (Globe Wireless) "VCT." (DW)

13200: THULE sending EAM traffic. F/R. (DS2 WI)

13200: THULE sending EAM traffic. F/R. (DS2 WI)

13215: 2000180, USAF MIL.STD 188-141A ALE on USB. Sounding, also at 1314z.. (DW)

13257: Architect, (RAF Flight Watch Center) L 2320 USB w/volmet. (RP)

13282: Honolulu, 1205 USB w/automated voice volmet. (RP)

13288: Reach 998, 0122 USB calling Mumbai Radio w/no response heard. Also at 0125 Reach 403Y calling Bombay. (RP)

13321: 014, ARINC KRASNOYARSK HFDL// on USB. Squitters (DW)

13354: San Francisco (MWARA CEP-1), Omni 770 w/position report & selcal check (FK-EM). Sets 5574 & 8843 as secondary freqs. (RP)

13370: RFFXCFA, Ukraine 20.03 ARQ-E 184.6/400 Poor rx but appears to be DET Brigabind Deux Ukraine with tfc in FF to unid station on UFA cct. Also Svc msg to FAVIERES. From French Army website, 2nd Armoured Brigade is on exercise at Cherokee Lane camp. (PT)

13457: FAAZLA, FAA Los Angeles, MIL.STD 188-141A ALE on USB. Sounding. (DW)

13457: FAAZMP, FAA Minneapolis, MIL.STD 188-141A ALE on USB. Sounding. (DW)

13457: UNID, Swiss Diplo ?LOC MIL.STD

188-141A Lnk prtd ALE on USB. Brief exchange (DW)

13464.7: 5BSG, Baumholder, Germany 09.50 Packet CE2002 Lithuanian NCS working, among others, LT44 - Lithuania, AL17 - Albania, MK16 - Macedonia. (PT)

13510: CFH, CF Halifax RTTY//75/N/850 Met tfc. (DW)

13550: CENTR5, MFA Bucharest MIL.STD 188-141A ALE on USB. Cng unid, then bursts of Mil.std 188-110A. B/I 600S, lead in "xxxxxq." (DW)

13846.7: RFV1, FF LE PORT, ARQ/E3//100/E/400 8rc. Betas. 1909z cct [RUN] C de v svc RFQP de RFQP. (DW)

13879: DG, Moroccan MOI ?LOC MIL.STD 188-141A ALE on lsb. Sounding. Also 1148 1218z. (DW)

13879: DEPT, Moroccan MOI ?LOC MIL.STD 188-141A ALE on lsb. Sounding. (DW)

13882.5: DDK6, Hamburg MET, FAX//120/576/N/800 N/Atlantic sfc analysis (DW)

13900: DEPT, Moroccan MOI ?LOC MIL.STD 188-141A ALE on lsb. Sounding. Also 1212z (DW)

13900: BMF, Taipei MET FAX//120/576/N/800 Satellite pix of Far East. (DW)

13907: CVS1, US Customs ?LOC MIL.STD 188-141A ALE on USB. Sounding. (DW)

13907: CS9, US CUSTOMS ?LOC MIL.STD 188-141A ALE on USB. Sounding (DW)

13977.7: RFTPA, N'djameina, Chad 20.05 ARQ-E3 200/400 Svc msg to RFFVA on FDZ cct. (PT)

14360: BGD, Slovakian EMB Baghdad MIL.STD 188-141A ALE on USB. Sounding. Also 1554z (DW)

14360: BGD, Slovakian EMB Baghdad, MIL.STD 188-141A ALE on USB. Sounding. (DW)

14400: ALG, Slovakian EMB Algiers MIL.STD 188-141A ALE on USB. Sounding. (DW)

14412: IDR, IN Rome RTTY//75/N/850 CARB "/IGJ41 /IGJ42 /IGJ43 /IDR2 /IDR /IDR8 /IDR5". Poor copy, disappeared into noise floor (DW)

14422: RBT, Algerian EMB RABAT MIL. STD 188-141A ALE on USB. Cng MAE. Algiers. (DW)

14430: FAVIERES, Paris, France 19.40 ARQ-E 184.6/400 5-lg tfc to RFFXCFA, Ukraine, on UFA cct. (PT)

14440: 11111, Austrain MIL ?LOC MIL.STD 188-141A ALE on USB. Cng BMLV1. (DW)

14461.7: RFTJF, FF Port Bouet? ARQ/E3//192/E/400 8rc. Betas. Poor sync. No app tfc thru 2303. (DW)

14490: OLZ65, Czech EMB ?LOC MIL.STD 188-141A ALE on USB. Cng OLZ88/Prague. (DW)

14550: 15C, UNID MIL.STD 188-141A ALE on USB. Cng OIC. Also at 0924z. Some ALE on this freq appears to be linkprotected - same or second user? (DW)

14550: 102, UNID - CHINESE? MIL.STD 188-141A ALE on USB. Cng 101. (DW)

14559: 116, UNID CHINESE? MIL.STD 188-141A ALE on USB. Cng 118. (DW)

14560: STA3, UNID - CHINESE? MIL.STD 188-141A ALE on USB. Cng STA7? (DW)

14580: CYP UK MIL/DIPLO CYPRUS MIL.STD 188-141A ALE on USB. Sounding. (DW)

14621.7: UNID, MFA CAIRO SITOR/A//100/E/170 Tfc in AA(ATU80), to London Embassy. (DW)

14670: CHU, TS OTTAWA USB Time signal. Just audible. QRM from FF stn on 14670.7. (DW)

14670.7: UNID, FF UNID ARQ/E3//192/E/400 8rc. Betas. Weak sync, improving. No app tfc thru 1916z. (DW)

14670.7: UNID, FF UNID ARQ/E3//192/E/400 8rc. Betas. No app tfc thru 2207z. (DW)

14700: 300, Tunisia?? 10.00 ALE/USB Calling 310. Also heard, A0 to DOB, 150 to 000, EOB to DOB, 930 to 0000, XOB to DOB, SFD to STAT5, TUD to TU1, STAT154 to TU3, 000 to 920 and TM3 to DOB. (PT)

14731: 055, E ASIA NET? MIL.STD 188-141A ALE on USB. Sounding. (DW)

14748.2: 6NF4, Baumholder, Germany 10.30 Packet CE2002 Belgian NCS working LV14 - Latvia. Not much tfc seen here. (PT)

14754.8: UNID, UNID FAX//120/576/N/800 Vague pix in noise thru 0700z. NOAA logo? (DW)

14810: BRA, MFA Bratislva MIL.STD 188-141A ALE on USB. Sounding. (DW)

14812: KAH, Slovakian EMB CAIRO MIL. STD 188-141A ALE on USB. Sounding. (DW)

14814: PRI, UK MIL/DIPLO PRISTINA MIL.STD 188-141A ALE on USB. Sounding. (DW)

14913: 369, E. Asian NET? MIL.STD 188-141A ALE on USB. Sounding. (DW)

14982.4: UNID, Tashkent MET FAX//60/576/N/800 Grainy sfc anal w/stn obs. (DW)

14996: RWM, TS Moscow CW time signals. (DW)

15016: Puerto Rico sending EAM traffic. F/R. (DS2 W1)

15016: Puerto Rico sending EAM traffic. F/R. (DS2 W1)

15758.7: 8WA40 Indian Emb Phnom Penh CG 0810 RTTY 50/170 clg & testing to 8WD36 New Delhi, no tfc. (ML)

15760: 8WD36 MFA New Delhi 0800 RTTY 50/400 clg & testing to 8WA40 Phnom Penh, no tfc. (ML)

15920: CFH, CF Halifax RTTY//75/N/850 Marker "naws de CFH zkr fl 2822 3394 4170 6254 8303 12371 16552 22200 ar" and kng Candaian w/ships "CY" and then "CK." (DW)

16000: VNG, TS LLANDILO B9W on ISB. Time sigs and voice announcements. (DW)

16026.9: BAF9, Beijing MET FAX//120/576/N/800 Noisy. 48hr prog chart. (DW)

16038.7: UNID, MFA CAIRO SITOR/A//100/E/170 Tfc in offline encrypt to Khartoum. Offair 0858. (DW)

16051.7: Egyptian Emb Nairobi (JG YPHKG GSFLYS) 1125 ARQ msg ATU-80 to Cairo. (ML)

16105: S94, Swedish Emb Guatemala City MILD.STD 188-141A ALE on USB. Sounding. Also 1115. (DW)

16105: S84, Swedish Emb Washington MIL.STD 188-141A ALE on USB. Clong S94/Guatemala City. Sounding 1013, 1101. (DW)

16125.2: RFQPTA, Djibouti 14.05 ARQ-M2 200/400 Ch A: Tfc in FF from RFQPT - COM-FOR DJIBOUTI to RFFUAJ - COTIA VIL-LACOUBLAY on QPB cct. Ch B: Svc msg rom RFQP to RFFTACS on QPC cct. Paired with PQB/PQC on 16165.2. (PT)

16147.7: UNID, FF UNID ? ARQ/E3//200/E/400 8rc. Betas but little sync. (DW)

16260: P6Z, Paris, France 15.45 FEC-A 192/400 MFA with svc msg to H6L, Algiers emb. (PT)

16268.5: GXQ, RN London ? PICC//VFT 2 chan Piccolo vft on USB. (DW)

16269: GXQ, RN London ? PICC//16269.01. Chan 1 (eng) in vft. On standby thru 1320z. (DW)

16269.4: GXQ, RN London ? PICC//16269.410. Chan 2 (tfc) in vft. On standby. (DW)

16275.2: UNID, MFA Algiers COQ/8//13/ Tfc in FF and in AA(ATU80). (DW)

16278.8: UNID, Algerian Emb Kuwait COQ/8 Tfc in AA thru 1337z. (DW)

16278.8: UNID, MFA Algiers ? COQ/8 Tfc in FF. Ends "gru". (DW)

16336.9: UNID, MFA Algiers COQ/8//27/- Inverted. Tfc in FF. Poor copy. (DW)

16341.4: UNID, MFA Algiers COQ/8//27/- Inverted. Opchat in FF. (DW)

16351.7: UNID, FF Paris ? ARQ/E3//192/E/800 8rc. Betas. Poor sync. No app tfc thru 1530z. (DW)

16351.7: UNID, MFA Islamabad SITOR/A//100/E/170 Wkng Stockholm Emb with "All Pareps" offline encrypted msg., then into betas for mins before resuming. Signed Foreign Islamabad. (DW)

16386.7: UNID, Pakistan Emb Stockholm SITOR/A//1-00/E/170 Rcvng tfc fm Islamabad. Occ loss of link - selcals KMEU. (DW)

16386.7: No-Call, Islamabad, Pakistan 18.15 ARQ FOREIGN ISLAMABAD with 5-lg tfc to PAREP STOCKHOLM. (PT)

16640: PRI, UK MIL/DIPLO PRISTINA MIL.STD 188-141A ALE on USB. Sounding. (DW)

16710.5: UAUC, Ship *Marshal Vasilevsky* SITOR/A//100/E/170 Selcals KYMV[3740]/Kaliningrad/UIW. Vri short qso. (DW)

16713: UEPQ M/V Nadevda 0825 ARQ tfc to Vladivostok. (ML)

16789: UNID, SHIP UNID SITOR/B//100/E/170 Rebroadcast of PNA news bulletin. 0721z midword went into permanent alphas. 0723z offair (DW)

16799.5: UNID, SHIP UNID SITOR/B//100/E/170 Weak, little sync. "said the cellphone "fernando" "for championship". PNA rebroadcast? (DW)

16799.5: RTMKS Angara 0700 RTTY 50/170 tfc to Kaliningrad. (ML)

16800.5: UIGT SRTM Sterkas 0737 RTTY 50/170 tfc to unknw (ML)

16801: UNID, SHIP UNID 3SC//50/R/170 End of msg in 3SC. (DW)

16801.5: UNID, SHIP BATM KING FICER 3SC//50/R/170 Tfc in 3sc via Kaliningrad. (DW)

16801.5: UEMP, SHIP RTMS MALTA 3SC//50/R/170 Tfc in 3SC via Kaliningrad. (DW)

16801.5: UBHT BMRT Revolutsiya 0729 RTTY 50/170 clg RLK 7 (? Arkhangelsk) to tfc. (ML)

16802.5: UNID, SHIP ZWEZDA 3SC//50/R/170 Tfc in 3sc. (DW)

16804: UNID, SHIP UNID 3SC//50/R/170 Tfc in 3sc. End of msg. (DW)

16804: RTMS Vituris 0725 RTTY 50/170 tfc to unknw. (ML)

16804: UCMD BMRT Pakhacha 0710 RTTY 50/170 clg Vladivostok UFZ DE UCMD then to tfc. (ML)

16804: V3AD3 unid vsl 0649 RTTY 50/170 clg Kaliningrad w/UIW DE V3AD3 tape to long msg in RUS 3rd shift cyrillic. (ML)

16804.5: UNID, GMDSS ALERT CHANNEL DSC//100/E/170 70 pkts in 1hr20. No distress/urgency. 60 safety/test. 10 illegals. C/stns logged - Lyngby, Perth, and Taupo. (DW)

16809: WLO, Mobile Radio CW Chan free marker "WLO". (DW)

16811.5: A9M, Bahrain Radio CW Chan free marker "de A9M tlx". (DW)

16811.5: UAT, Moscow Radio SITOR/B//100/E/170 Tfc list. (DW)

16812.5: NRV, USCG Guam CW Chan free marker "NRV". (DW)

16814.5: HEC, Bern Radio CW Chan free marker "HEC". (DW)

16971: JJC, KYODO Tokyo FAX//60/576/N/800 Japanese news script. (DW)

17026: KFS, Bolinas, CA with transmitter test at 2005, 6/01/02 in CW. (RW)

17146.5: CBV, VALPARAISO PLAYA ANCHA FAX//120/576/N/800 Swell/ice edge chart. Weak outlines in noise. (DW)

17170.4: ZLA, GW NODE AWANUI CW Chan free marker (Globe Wireless) "ZLA". Wkng ship in Globedata qsx 16651.5. (DW)

17249.4: LSD836, GW Node Buenos Aires CW Chan free marker (Globe Wireless) "LSD836". Wkng ship in Globedata. (DW)

17351.4: ZLA, GW NODE Awanui CW Chan free marker (Globe Wireless) "ZLA". Wkng ship in Globedata QSX 16469.4. (DW)

17402.4: VCT, GW NODE TORS COVE CW Chan free marker (Globe Wireless) "VCT". Wkng ship in Globedata. (DW)

17408.4: HEC, GW NODE Bern CW Chan free marker (Globe Wireless) "HEC". Wkng ships in Globedata. (DW)

17415: S84, Swedish Emb Washington MIL STD 188-141A ALE on USB. Sounding. Also at 1014. (DW)

17430: 9VF209, KYODO Singapore FAX//60/576/N/800 Press in JJ script (DW)

17441.6: 5YE, Nairobi MET RTTY//100/N/850 Mil tfc. Poor copy. "RY's cq de 5YE". (DW)

17445: 5YE, Nairobi MET FAX//180/576/N/800 Sig WX chart of Africa. Grainy pix. (DW)

17451.7: UNID, Egyptian Diplo ? LOC SITOR/A//100/E/170 Betas and opchat in AA(ATU80) then offair. (DW)

17451.7: UNID, Egyptian Rome SITOR/A//100/E/170 irs mode then tfc in aa(ATU80) and s/off. (DW)

17462.7: UNID, FF Paris ? ARQ/E3//200/E/400 8rc. Betas. Poor sync thru 2308z. (DW)

17490: CYP, UK DIPLO/MIL Cyprus MIL.STD 188-141A ALE on USB. Sounding. (DW)

17495.7: FF UNID, ARQ/E3//200/E/400 8rc. Poor sync. Bdest qrm eventually swamping signal. (DW)

17510: OXT, Copenhagen MET FAX//120/576/N/800 Ice chart, vague outlines, buried under qrm fm bdcst. (DW)

17567: 015, ARINC Bahrain HF DL// on USB. Squitters. (DW)

17928: 006, ARINC HAT YAI HF DL// on USB. Squitters. (DW)

18012: Circus Vert, (HQs CFAP, Villacoublay): 1352 USB advising unheard aircraft that he will relay his message for action. (RP)

18183.4: UNID, MFA Algiers COQ/8//13/- Tfc in FF, Wkng Yaounde. (DW)

18183.4: UNID, MFA Algiers COQ/8//27/- Inverted. Tfc in EE. (DW)

18220: JMH5, Tokyo MET FAX//120/576/N/800 Grainy, with slight alternate path ghosting. End of sfc analysis. (DW)

18238: ZSJ, San Capetown FAX//120/576/N/800 Vague outline in noise floor. S/African c/line just visible. (DW)

18261: GYA, RN Northwood FAX//120/576/N/800 Mid east svc. Schedule - still dated 22/10/2001. Weak copy due being at rightangles to path. (DW)

18320: BRA, MFA Bratislava MIL.STD 188-141A ALE on USB. Sounding. (DW)

18350: ALG, Slovakian Emb Algiers ? MIL.STD 188-141A ALE on USB. Sounding (DW)

18476.7: No-Call, Cairo, Egypt 15.20 ARQ MFA with 5-1g and AA tfc to Luanda emb. (PT)

18720: KAH, Slovakian Emb Cairo MIL.STD 188-141A ALE on USB. Sounding (DW)

18940: BDF, Shanghai MET FAX//120/576/N/800 Grainy pix. Forecast areas. (DW)

19048.8: RFFKC, Paris, France 15.45 ARQ-E3 192/400 5-1g tfc to RFTJCF and RFTJC on LFA, Paris - Dakar, cct. (PT)

19145.7: RFTJ FF Dakar 0730 ARQ-E3 200/400 sign off msg to RFQP Jibouti & then off-air, cct DKJ. (ML)

19414.4: UNID, Algerian Diplo ? COQ/8// End of qso. Opchat in FF. (DW)

19571.7: No-Call, Cairo, Egypt 15.32 ARQ MFA calling Rome emb - XBVP. (PT)

19647: Z4D French Emb Nouakchott MTN 0900 FEC-A 192/850 clg Paris w/P6Z DE Z4D & then off-air. (ML)

19736: ZLA, GW NODE AWANUI CW Chan free marker (Globe Wireless) "ZLA". Wkng ship in Globedata. QSX 18882. (DW)

19945: ADZ, Algerian Emb Agadez MIL.STD 188-141A ALE on USB. Cng MAE/Algiers. (DW)

19945: NKT, Algerian Emb Nouakchott MIL.STD 188-141A ALE on USB. Cng MAE/Algiers. (DW)

19945: MAE, MFA Algiers MIL.STD 188-141A ALE on USB. Cng GAO/Gao. Exchanges calls with Nouakchott then into MSM1250 modems. 1554 clng RBT/Rabat. (DW)

19945: MAE, MFA Algiers MIL.STD 188-141A ALE on USB. Responds to ADZ/Agadez call, then MSM1250 modem. (DW)

20076.7: UNID, Egyptian Diplo? SITOR/A//100/E/170 Brief opchat in AA(ATU80) and s/off. (DW)

20086.7: UNID, Egyptian Emb Kinshasa SITOR/A//100/E/170 Tfc in offline encrypt then in AA(ATU80). Poor, copy. S.off 1408z. (DW)

20107: 055, E Asian Net? MIL.STD 188-141A ALE on USB. Sounding. (DW)

20340: ADZ, Algerian Emb Agadez MIL.STD 188-141A ALE on USB. Cng TNS/Tunis. (DW)

20340: TNS, Algerian Emb Tunis MIL.STD 188-141A ALE on USB. Responding to ADZ/Agadez. (DW)

20631: MPA, UNID - USAF? MIL.STD 188-141A ALE on USB. Sounding. (DW)

20698: S53, Swedish Emb Ammam MIL STD 188-141A ALE on USB. Sounding. (DW)

20717.7: 2BS5, Baumholder, Germany 09.34 Packet CE2002 Belgian NCS working KZ31 - Kazakstan. This NCS actually has callsign 7BAD. (PT)

20861: N2G, San'a, Yemen 15.05 FEC-A 192/400 French emb with 5-1g tfc with letter sub to Paris. (PT)

20942: S97, Swedish Emb Abidjan MIL.STD 188-141A ALE on USB. Sounding. (DW)

20945: LN2A, Sveio Beacon on USB. Very weak. Data burst with "LN2A" CW ID. (DW)

20946: 8BY, French Intel Paris CW Marker "vvv 8BY 914/661/153/237/313". (DW)

20958: S84, Swedish Emb Washington MIL.STD 188-141A ALE on USB. Sounding. (DW)

20990: BGD, Slovakian Emb Baghdad MIL.STD 188-141A ALE on USB. Cng Bratislava/BRA then short bursts of 10 channel modem (MSM1250?). (DW)

20990: BGD, Slovakian Emb Baghdad MIL.STD 188-141A ALE on USB. Sounding. Also at 1108, 1200. (DW)

20995: ALG, Slovakian Emb Algiers MIL.STD 188-141A ALE on USB. Sounding. (DW)

20995: KAH, Slovakian Emb Caiaro MIL STD 188-141A ALE on USB. Sounding. (DW)

22311: ELKE3 BST Pinna 0822 ARQ tfc to Kaliningrad, 24381 ELKE3 log on. (ML)

22311: UBDB TH Kulikovo 0745 ARQ msg to Kaliningrad, UBDB log on. (ML)

22354.5: UEJZ MTR Rezvaya 0727 RTTY 50/170 clg Kaliningrad w/UIW DE UEJZ to tfc headed MTR REZWAQ KLD/UEJZ (ML)
22356: YLFC RTMS Kauguri 0943 RTTY 50/170 crew msg to unknwn. (ML)
22380.5: CBV, VALPARAISO RADIO CW Chan free marker. 2149z ARQ, wkng ship CBRL/Rio Blanco. (DW)
22469.4: ZLA, GW NODE AWANUI, CW Chan free marker (Globe Wireless) "ZLA". Wkng ship in Globedata. qsx 22211.5. (DW)
22475.5: PWZ33, BN Rio De Janiero RTTY//200/N/850 Tfc in online encrypt. 2025z ship movement list. 2030z returns to encrypted msg(s). (DW)
22537: FUF, FN FT DE France RTTY//75/N/850 Marker "FAA de FUF testing ry's sg's figs testing". (DW)
22628.5: UNID Sends P 151702 GR03 ZFJ NIL ZRR NIL WX FOR AREA B ANDGMG COAST + VWGO VWGZ ZUJ70 ZUJ70 +, Then in to high speed CW. (RM)
22676: PBC DN Goeree Island RTTY//75/N/850 CARB. Poor copy. (DW)
22769: 055, E Asian NET? MIL-STD 188-141A ALE on USB. Sounding. (DW)
22928.6: S97, Swedish Emb Abidjan MIL-STD 188-141A ALE in USB. Sounding. (DW)
23214: D43, US Customs ?LOC MIL-STD 188-141A ALE on USB. Sounding. Also at 1810z. (DW)
23214: PR1, US CustomsS ?LOC MIL-STD 188-141A ALE on USB. Sounding. Also 1302 1646 1730 1817. (DW)
23428: 055, E Asain Net ? MIL-STD 188-141A ALE on USB. Sounding. Also 1246 1307. (DW)
23522.9: JMH6, Tokyo Met FAX//120/576/N/800 72 hr sfc prog (two charts). Pronounced offset from signal on 18220. (DW)
23526: S93, Swedish Emb Havana MIL-STD 188-110A ALE on USB. Clnq ?unid. Also at 1624z. (DW)
23526: S92, Swedish Emb Managua MIL-STD 188-141A ALE on USB. Sounding. Also 1251. (DW)

This month's contributors are:

CG	Chris Gay
RCW	Colonel DX
DW	Day Watson
DS2 WI	Dwight Simpson
MADX	Mid Atlantic
ML	Murray Lehman
PT	Peter Thompson
RP	Ron (Middle Atlantic Milcom)
RCWS	Robert C. Williams, Sr.
RM	Richard Monjure
SK	Sergey Kolesov

Thank you all for your contributions. As always, they are greatly appreciated.

Please keep them coming. And new contributors are always welcome.

Next Month

Since 9/11 there has been a great increase in national security throughout the world, and in North America in particular. While much of the focus has been on anti-terrorism, there are still many traditional areas of security that have come to be equally important.

Because a wide range of people try to get into the United States illegally on a daily basis, many of the more traditional services have had to increase their alertness. One of these is the United States Coast Guard.

Next month I will be looking at the role of the Coast Guard in the post 9/11 period and point you in the direction of some very interesting monitoring activity that has been taking place over the past few months. There are lots of hot frequencies

to monitor where exciting activity is taking place on an almost daily basis.

Thanks again for your continued support and interest in this column. I hope that over the upcoming months I will be able to reward that interest with some very interesting columns and articles that I have been researching over these past few months.

Don't forget that you are welcome to make your own contributions as well, be it letters, logs or articles. Remember that I am here to fix up any problems; so don't be worried about making the first draft perfect. I don't care, and I'll work with you to make the project a success.

In the meantime, the conflicts abroad are far from over, and our security at home is still being managed at high levels of concern. Please continue to say a prayer for our security forces, be they local police and fire fighters, or in the military services over seas. Each and everyone of them is appreciated for what they do. ■

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Tuning In (from page 4)

nize trouble coming our way. But folks, it didn't begin with Bill Clinton, and it won't end with George W. Bush, Jr. Thousands of lives were lost, the economy was sent into a tailspin, and every three weeks now we're reminded of a new "threat" (as if even the average person on the street doesn't know the delivery methods of terror).

And the heads of those agencies that didn't see it coming are still there; the chiefs of the FBI, CIA, NSA, the National Security Advisor, and the Secretary of Defense should all be brought to task in front of Congress. Were any of these "leaders" a Platoon Sergeant, Squad Leader, or ship's captain and there was a major incident where they could be faulted, trust me, the system would either reassign them or force them to retire (whichever cost the government the least amount of money). It's too bad for all of us that this same standard doesn't work at the higher echelons. Someday, maybe it will, but for now we're stuck with a system that, at the highest levels, rewards incompetence.

All war is politics. I remember sitting, sweating in a miserable foxhole in Saudi Arabia in March of 1991 when then President Bush, Sr., and the allies stopped a perfectly good war and didn't press on to Baghdad. Hindsight is 20-20, they say. But one must question today if Iraq would be part of the Axis of Evil, or just another large refueling base for our military had we gone the distance. Still, even there I recall hearing one two-star Army general saying words to the effect "damned Navy" in one Battle Damage Assessment (BDA) briefing. Oh, how easy it is to

claim that our turf is better than their turf, when in fact, it's all one turf we should be concerned about protecting.

Now if you're thinking I should be reflecting, praying, and being supportive of our leaders in this time of crisis, believe me, I've done that and will continue to do so, as I hope you have. But if we're to overcome our problems and be honest about what got us to this point we had better assess not just our personal lives, but our democratic way of life, and our government as well, and talk about our freedoms—or erosion thereof—post-haste because, my friends, this is one time in history when time is definitely not on our side. We've been far too complacent about far too much for far too long, and now we're paying the price.

A year ago in New York, Pennsylvania, and at the Pentagon, even radio revealed flaws. To a great degree modern greed caught up with us on 9/11 as New York's firefighters were unknowingly trapped in the Towers as a result of radio failure. It's all about money, folks. What's sad is that these are the same radio failures we've known about for years. It's been all over the media. We've talked about it in *Pop'Comm*, and public safety publications and organizations have been talking about it for years. All the TV networks have aired news about those supposed high-tech public safety radios that have failed cops all across America while taking fire in the line of duty, putting their lives—and those they're sworn to protect—in jeopardy time and again.

So what is it about our government that's like a young child hearing for the 10th time, "Johnny, you're going to fall if you swing from the ceiling fan"? Collectively we keep hearing about the

problem, see that many of our trunked and digital systems just don't work as advertised (perhaps that's the operative word and a great part of the problem) yet city after city comes on board with lame systems that fail when the chips are down. In the greatest city in the world, overworked cell systems failed. It seems to me that we certainly have the ability to choose our high-tech tools wisely, put them into use protecting our citizens during the worst possible scenario, and yet cities and states have become so enamored with the latest and greatest that they blindly keep making the same mistakes time and again. When will they learn that selling radio systems is a business, plain and simple?

Meanwhile, the professionalism of our public safety pros was outstanding; putting their lives on the line for us! On the other hand, I also heard more than one conversation from our combat air patrol pilots discussing their *boredom*. Boredom? Imagine flying a multi-million dollar machine over the East Coast in defense of our country within hours of thousands losing their lives, with the country on the brink of God-knows-what, with the Vice President in a bunker, and some of these fellows were bored? Of course that's not to diminish the heroism and devotion to duty of the overwhelming majority, but it's those subtle, unfortunate holes in our armor, that give those that would harm us a fighting chance at succeeding as they look for our weaknesses and exploit them.

Hopefully the lessons learned over these days are permanent ones, but if history and time has taught us anything, it's that we're very poor students with a lot to learn about one another and those humans on the other side of the world who want to live and raise a family like normal people. To that end, radio will continue to play a vital role in learning about other cultures...and, yes, ourselves. Listen to what the Europeans, Arab world, and China are saying about us; listen to what we're saying about them, and take the time to listen between the lines to the elected representatives who work for us.

It's also high time we push the politicians for a renewed energy policy. Burning fossil fuels like there's no tomorrow might just give us that end result. If you think the terrorists have heat rash now, imagine how they'd feel if we began working seriously toward clean, basically maintenance free solar energy. It won't happen if Greed and power have their way.

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Harnessing Bill

I have never climbed towers, because by the time I finally got around to having a need to climb towers, my gravitational pull increased to that of about two average tower climbers. Towers are, for the most part, straight-up climbs, as opposed to those comfortable ladders that you prop against a house or barn at approximately a 20-degree angle and stroll leisurely upwards with all your weight on your feet, as it is when you're on solid ground.

No, towers are different. Towers, like iron ladders atop commercial buildings, are just about pure vertical. Your legs get plenty of exercise, to be sure, but by the time you're finished, you've got a new respect for your arms. In a straight, vertical climb, your arms hold (and lift) a lot of your weight, which in my case is a whole lot of weight.

My high-paying job in electronics (you didn't really think I just wrote a column once a month, did you?) takes me to exciting new places every day. Many of them rather high. For the towers, and the jobs requiring a really agile climber, we enlist the skills of a professional tower climbing (rigging) service, often the folks from U.S. Tower, which is somewhere in western Maryland. I don't have to know where they are—I have their phone number.

They send young, thin, agile, experienced—and in my mind, completely fearless—young men and women (yup, really) to climb our towers and do the little things that need doing waaaaaaaaaaaaaay up in the air where persons such as myself have no business going.

But there are times when I must climb “a little bit,” and often that means “a little bit up from the roof of a 300-foot building” and not too far from the edge of the roof, either. To be honest, these are pretty easy jobs; sometimes I can get away with a stepladder, or stand on top of a railing while hanging on for dear life, but I'm old, and along with that comes stiff and achy, and without the stamina I never really had in the first place.

Two weeks ago, our friends at U.S. Tower sent another highly trained (and otherwise healthy and “in-shape” climber to handle a job I couldn't do by myself. He showed me the “positioning harness” he used and the lanyards that held him in place while he worked. I watched him work and realized that if I could “hang” there, suspended in mid-air with my weight supported by a half-dozen various points on my body, I might be able to use two hands to work and would not have to spend most of my time up there clinging for dear life, expending most of my diminishing strength doing so.

Well, this morning, company credit card in hand, I arrived at the place where we spend way too much of the boss's money, and picked up my “positioning harness” and two lanyards. Yes, it really is a “universal fit,” because it fits me, and I'm the size of a universe. I was pleasantly surprised that the straps which go under my, er, legs, did not cause me too much discomfort,

and that adjusting the thing to fit properly and safely was not hard at all. It's also worth noting (for those of you foolish enough to try this at home) that a good OSHA approved positioning harness with four D-rings can be had for under a hundred bucks (oops, now the boss knows what I spent). Good lanyards can run \$65 each and up, and two is the least I'd work with.

Now would be a good time for me to emit a plaintive plea:

“Norm—and all the other cheapskates like you out there—this is NO PLACE TO SCRIMP!”

OK, so here I go, heading out in the Guatemalan humidity that our nation's capital is so noted for, ready to dangle my participle (and the rest of me) 10 feet atop a 320-foot tall building, feet propped on an iron railing, and use BOTH HANDS to get my work done instead of hanging on for dear life.

I gotta tell you, it worked like a charm. Last week, prior to getting the positioning harness, I had spent two hours trying to insert and tighten four little (#4-40) machine screws to fasten a snippet of waveguide in place between a microwave transmitter head and the antenna. At no time was I able to use two hands so even after two hours trying I was no farther ahead than when I had begun.

Today it took me 15 minutes to fit my large self into the harness, and when I had climbed up to my destination, it took me two minutes to fasten myself to a four-inch pipe, and get myself into precisely the right position by varying the number of turns I wrapped around the pipe. I had no hesitation to flap my arms wildly and yell, “I can fly! I can fly!”; however friend and companion Steve Bradley was quick to point out that I only thought I could fly, and that those ants down below us were driving cars and trucks.

So, I yelled “I can work! I can work!” as I tightened the screws and realized that they were too long for their intended use. Still I was so happy to have the freedom to use two hands to work that I didn't even mind cutting the ends off the screws so they'd fit properly.

After swimming, I always feel heavy when I step out of the water and my body is no longer partially buoyant, as the water so kindly does for me. Well, I'm here to tell you that after being suspended—even in a precarious place—when my feet hit that roof I was heavy again. Even though the window-washers were chuckling (I speak enough Spanish to know what “he looks like a steer that's been drawn and quartered” sounds like), I knew from this day on that I'd only give up my harness when they pried it from my cold...hey! Wait a minute! That's my gun!

Anyway, after I'm safely in bed tonight, I might just slip that puppy back on to sleep in. In fact, maybe I'll wear it under my pajamas. It wouldn't take much to fasten a nice big eye-bolt into the bedroom ceiling. Oh, does a certain lady have a surprise in store tonight. Now, if I can just find some green material for my Peter Pan costume.... ■

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