

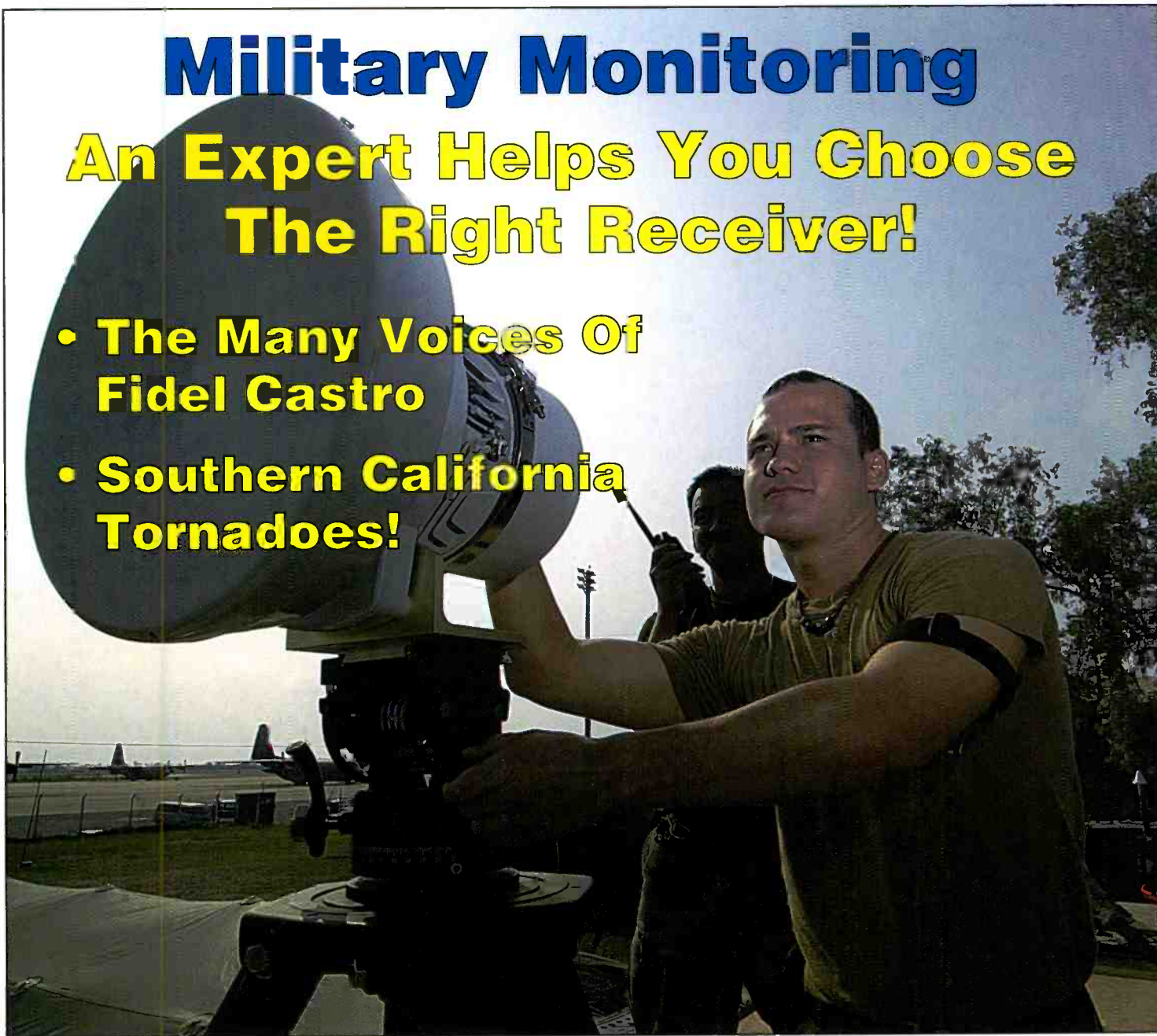
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APRIL 2005

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Call for price.



R5 The R5 covers 150 kHz to 1309.995 MHz (less cellular gaps) in: AM, FM Narrow and FM wide. 1200 memories store: frequency, mode, step

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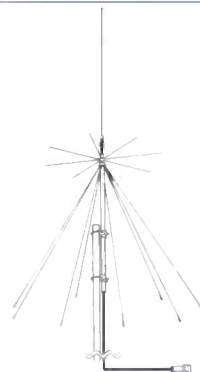
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On The Cover

Here's Senior Airmen Roque Aapoon and Michael Vaughn making adjustments to a microwave antenna in Thailand. They're part of an 18,000 service member force working with international militaries and non-governmental organizations to aid the affected people of Thailand, Sri Lanka and Indonesia following the devastating earthquake and tsunamis. To hear long-distance utility comms you need a good receiver and a guide. Every month, columnist Steve Douglass takes us on a fascinating journey into military and even "Black Project" monitoring. This month he has special inside news about the shortwave receivers, and dozens of great loggings that will help keep you on top of the Utility monitoring action beginning on page 64. Remember, as Steve says, "The more you know about the military, the more you'll get out of your MILCOM monitoring." (Photo by Tech Sgt. John M. Foster)



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Michael K. Powell Has Left the Building— Wait, Please Take Kathleen With You

To ordinary, thinking Americans it doesn't really matter why, but Michael K. Powell is now a *former* FCC Chairman. More importantly, he's gone. The official Powell statement said, "Having completed a bold and aggressive agenda, it is time for me to pursue other opportunities and let someone else take the reins of the agency. . . . During my tenure, we worked to get the law right in order to stimulate innovative technology that puts more power in the hands of the American people, giving them greater choices that enrich their lives."

It's always the same line: "I enjoyed working for the President so much, it sent a chill up and down my spine every morning I got up for work, and honestly, I'd stay on if it weren't for wanting to pursue work in the private sector."

I just wish Mr. Powell—as much as he didn't do for the Commission and people he served—would have *listened* to more technical experts other than just business executives who want a piece of the spectrum. The official record shows clearly that he did not. And true to form, like so many other politicians we experience today, he arrogantly continued on, acting in the face of fact and reality.

Despite the Official Sanctum words, it's clear that there's some discontent brewing in the Beltway. Let's face it: If you were *indeed* happy at your current job, or your boss wanted you to stay on, you'd stay put. In Mr. Powell's case, it certainly isn't that he's not pleasing to the Boss. After all, he did the bidding for big business—something the FCC isn't supposed to do. And even when his underling, Commissioner Kathleen Q. Abernathy, cuddled up with the Broadband over Power Lines (BPL) industry, he did nothing. So, in effect, Powell did *do* a lot, just not *for* his country—and certainly nothing very positive.

The damage done to us during Powell's FCC reign is a matter of official record. He'll probably be remembered by most Americans for presiding over the FCC during the Janet Jackson Super Bowl breast-bearing fiasco. He made darned sure the media knew that the buck stopped at his desk, as the Commission fined Viacom a grand total of \$550,000. Since then, as one would expect, the government indecency crackdown moved into ultra-high gear, with even tougher per-incident legislation and even media self-censorship.

Just two years ago during Powell's tenure, the Commission's rules were changed, allowing media companies to own more TV stations in a single market, and even allowing them to control a TV or radio station and newspaper in the same city. But so far the US court system has stopped the new rules in their tracks, basically telling the Commission to justify their thought process. Meanwhile, the Commission is hoping the Supreme Court will take its case. Just another sad Powell legacy that takes more away from America than it gives.

Then there's the BPL issue, which is close to (or should be) radio enthusiasts' hearts and S-meters. ARRL CEO David Sumner, K1ZZ, called Powell's performance "a deep disappointment" after some initial optimism. The official League statement said, "While the League is not unhappy about Powell's departure, especially given his unabashed cheerlead-

ing on behalf of the FCC's broadband over power line (BPL) initiative, there's also concern about whom President Bush might call upon to replace him."

Indeed, there's the rub. Will it be Commissioner Kevin Martin or Kathleen Abernathy? In the past, Martin has butted heads with Powell on key issues, while Abernathy has been Powell's personal puppy dog, and an omnipresent industry representative. Her public embracing of the BPL industry was evident when she, as we reported in January 2004's "Tuning In," lauded BPL as "broadband nirvana" in a 2003 speech given to the UPLC. Back then she said, "I am very excited about broadband over power line technology . . . and believe it has a very bright future." She continued, ". . . continuing development of BPL technology is a major step forward . . ."

Abernathy also said, "When the Commission completes this rulemaking I expect that we will eliminate many existing rules and substantially modify others; the central question is the degree of regulation that will remain during the transition to a more robustly competitive market."

All of those comments were made on Mr. Powell's watch, of course. Talk about cuddling up with BPL and the power industry! At the time, *Pop'Comm* went on the record, "calling for Commissioner Abernathy to remove herself from future BPL proceedings. If she can't—or won't—Chairman Powell should request her resignation."

Of course that never happened, but if the rumors are correct, and I hope they are, she might resign shortly after the door closes on the Powell era. Who's next? My personal bet for the Chairman's position is Rebecca "Becky" Klein, who has close ties to President Bush and is former chairperson of the Texas Public Utility Commission.

However, from a realistic perspective, at least for a couple of years, it really doesn't matter who gets the job, because the Bureaucratic Ball is rolling—and sadly, right over you and me. And as it rolls, it takes with it bits and pieces of Americana.

Many times our readers say it so perfectly. So it is this month, with a few closing words from amateur operator Ken Decker, WA6OSB, who wrote to us saying, ". . . I must say the FCC has been anything but slow on the issue of Broadband over Power Lines. Effective? Yes, in ramrodding through this political can of worms in spite of overwhelming technical evidence against spraying RF from our power lines." He continued, "As if that wasn't bad enough, now the FCC suggests radio amateurs, a licensed service, relocate their antennas if they experience interference from BPL, a Part 15 service. Will this suggestion also apply to other services? We can only wait and see. I think we need more engineers and less bureaucrats in the FCC upper levels."

Powell apparently has listed the Commission's adoption of BPL rules on his resume. His cover letter says he is leaving the Commission "with a mixture of pride and regret."

Mr. Powell, I think it's likely our children and grandchildren will regret you didn't leave sooner. Much sooner. That you didn't, and didn't exit gracefully with Ms. Abernathy in tow, unfortunately makes us all April Fools. ■

OUR READERS SPEAK OUT

Each month, we select representative reader letters for "Our Readers Speak Out" column. We reserve the right to condense lengthy letters for space reasons and to edit to conform to style. All letters submitted must be signed and show a return mailing address or valid e-mail address. Upon request, we will withhold a sender's name if the letter is used in "Our Readers Speak Out." Address letters to: Harold Ort, N2RLL, SSB-596, Editor, Popular Communications, 25 Newbridge Road, Hicksville, NY 11801-2909, or send e-mail via the Internet to popularcom@aol.com.

Surging Ahead

Dear Editor:

Please allow me to speak out on the subject of surge protection. Besides being a ham for the past 45 years, and suffering my share of damage from surges and transients, I am an Application Engineer for a manufacturer of power quality equipment, which includes Transient Voltage Surge Suppression (TVSS) and Surge Protection Devices (SPDs).

Unfortunately, there is not much that can be done for the "direct strike," but luckily, very few of us ever deal with those. And dealing with transients and surges needs to be more than putting a few "surge strips" at the outlets serving your valuable electronics!

The beginning of a good system is a good grounding system. If you drive extra ground rods for your equipment, *make sure* they are bonded to other rods used in your system. *Never* use "isolated" rods. Besides being unsafe, possibly causing a shock hazard, they will make surge protection an impossible task. *Never* use a piece of equipment that "ties" the power line neutral to the ground in your shack!

The best surge protection is done in "layers." Begin with a good SPD right at the service entrance. Short leads are best, as unnecessary impedances will limit results. Install the device per the manufacturer's instructions. If you do not feel comfortable doing it yourself, hire an electrician!

If you have a subfeed panel, add another device there. Make sure that you keep the neutral and ground isolated in the subpanel. Add SPDs at the outlets feeding your equipment. Strips are OK here.

Do not forget to put SPDs on incoming antenna, telephone, data, or broadband lines! Many years ago, I saw the results of a ham's house where a surge from a lightning strike entered on the phone line. That can be as devastating as a power-line surge! Again, put them where the service enters the house. *Never* assume that the device the utilities provide is adequate! Most manufacturers offer these devices as well as power-line devices.

Last, remember that these devices use MOVs, which "age" with every surge they

"absorb." Most of the high-quality devices use an LED indicator to show they are working properly. If the LED goes out, replace the device! Some of the high-priced industrial units have replaceable modules, but most of the simple residential units should simply be replaced entirely.

The Internet is a good resource for information on the proper techniques.

J. Richard Hanna, K3VYY
Beaver, PA

If It's Broken, Fix It

Dear Editor:

Regarding public safety communications not working properly, I like your unscientific way of figuring that there are "about 100 communities across America that have been left unprotected" (February "Tuning In"). In our post-9/11 era, all of these problems should have been taken care of pronto, but sadly they haven't been. You're also right in saying, "We're so darned predictable."

I do a lot of reading on the Internet and listening to AM radio at night, and I really think we still don't understand who the real enemy is—certainly not the Republican Guard or Saddam. Clearly, our focus is wrong. Thank you, *Pop'Comm*, for giving us "the rest of the story." It's about 8 PM now and time to listen to shortwave!

John Emery
San Antonio, TX

Down With Power Strips!

Dear Editor:

The letter from Michael Stranathan (*Pop'Comm*, January 2005) was right on target in criticizing power strips, which rely on MOVs, to protect your gear. Unfortunately, the last paragraph offers the wrong solution. More MOVs will not solve the problem.

Uninterruptible-Power Supplies (UPSs) will. UPSs that can be purchased for less than \$100 will do the job right and last for many years. They will also keep you running for a few minutes when the power fails. Check them out.

Bruce McIntosh
Illinois

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News, Trends, And Short Takes

APCO Teams Up With Central Station Alarm To Improve Computer-Aided Dispatch

The Association of Public Safety Communications Officials (APCO) International and the Central Station Alarm Association (CSAA) have announced that they are joining forces to develop a product that will be consistently used by computer-aided dispatch (CAD) vendors and alarm companies for public safety answering points (PSAPs) to increase efficiency and decrease errors. APCO International established the CAD to CAD Interconnectivity Project, Project 36, in August 2000 to explore the interconnectivity between different CAD systems. In August 2004, APCO International encouraged the expansion and spin-off of Project 36 with the inclusion of voice and data exchange between PSAPs and Telematics Service Providers (TSPs) as well as Central Station Alarm Companies. The APCO International Board of Officers assigned the expanded version of this data exchange development program between PSAPs, TSPs, and Central Stations to a new Third Party Call Center Group, which included CSAA. Three beta sites were selected for the initial test project to conduct tests between PSAPs and Central Stations over the Internet; they are York County, Virginia; Palo Alto (California) Police Communications; and the Port Orange (Florida) Regional Public Safety Communications Center. As of press time, York County successfully completed a data template exchange between the PSAP CAD and the Central Station's alarm provider.

"It is the intention of APCO International that this joint alarm project will lead to a standard for all PSAPs who wish to use this procedure after its proven development," APCO International president Greg Ballentine said. "Likewise, we would expect CSAA to provide these results to all its alarm companies for their use with PSAPs," he continued. The next effort will be to define data elements that would normally be exchanged with a focus on the operational impact of the receipt of such data. The effort will likely follow the pattern of TSPs and Central Stations through the use of focus groups from private industry and PSAPs to jointly develop realistic data sharing.

NAC Honors Congressman With Outstanding Public Service Award

The National Antenna Consortium (NAC) has honored U.S. Rep Steve Israel (D-NY) with its Outstanding Public Service Award. NAC executive Director (and 2004 ARRL President's Award recipient) Gerry Agliata, W2GLA, made the formal presentation during a ceremony at Israel's Hauppauge, Long Island, office. On hand to represent the ARRL was New York City-Long Island Section Manager George Tranos, N2GA. *QST* "YL News" editor Diane Ortiz, K2DO, represented the Long Island Mobile Amateur Radio Club (LIMARC), of which she's immediate past president. CQ Publisher Dick Ross, K2MGA, also attended. The NAC honored Israel with the first-ever award to recognize his "introduction of, and sustained advocacy for, legislation to require reasonable regulation of Amateur Radio

Service antennas and related equipment by homeowners' associations and/or restrictive covenants (CC&Rs)."

Israel sponsored the Amateur Radio Emergency Communications Consistency Act, designated HR 1478, to require private land-use regulators, such as homeowners' associations, to "reasonably accommodate" amateur radio antennas consistent with the PRB-1 limited federal preemption. For more info on NAC, visit <http://www.antenna-consortium.org/>.

Japan May Lift Ban On Data Communications Via Power Lines

Japan plans to launch a debate on lifting a ban on using power lines for data communications, enabling people to get access to the Internet at high speed. If the study group finds no technical problem with the new service, the ministry will move for the deregulation as early as 2006. Data communications based on power lines would enable users to build local area networks at home or to access the Internet and control air conditioners and other home appliances from remote places. The ministry currently bans such use of power lines due to concerns that the 2- to 30-MHz frequency spectrum, which is expected to be used for the new services, may interfere with existing radio services, such as amateur radio.

Egypt's External Radio Service Cut To 11 Languages

Radio Cairo, one of the largest international broadcasters in terms of transmission hours and number of languages, will be reduced to 11 languages, perhaps as we go to press. Reports of the imminent reductions have been circulating for months. English and Spanish would be among the languages retained, while Turkish and some African languages would be dropped.

Help From All India Radio In Andaman And Nicobar Islands

Glued to battery-operated radios, Tsunami survivors in the Andaman and Nicobar Islands are getting updates on missing relatives and aid with the help of All India Radio (AIR). Its transmission center in the Andaman capital of Port Blair has been relaying messages 16 hours daily to islands where telephone lines had been washed away when killer waves hit Asia. Hotels, shops, and taxi drivers are turning their dials to AIR, whose executives have become regular announcers broadcasting messages received from around the islands and from the mainland in several languages. Residents, police, and aid workers fear 10,000 people died across the 500-plus islands that stretch over 800 kilometers. The Port Blair radio station, near the mouth of one of the world's busiest shipping lanes, the Straits of Malacca, is also reaching boats in the region. After listening to AIR broadcasts in English, a U.S. cargo ship rescued six Indian fishermen who were lost in international waters. Two female AIR workers, Lalita Tigga and Jaysheela Lakra, and five engineers can

(Continued on page 78)

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Listening To Castro On Cuban Radio

Broadcasters Still Face Strict Rules In 2005!

by Toby Osborne

Any form of media operating under a Communist regime faces more stringent regulations than do broadcasters functioning elsewhere in the world. Cuba, where Communism reigns supreme, is no exception.

Radio stations in Cuba have long been used as mouthpieces for President Fidel Castro, and propaganda has been one of the main propellants behind the proliferation of stations in the country. And each station must abide by the strict rules set by Castro's government. What kind of rules? Well, anti-government propaganda and the insulting of officials both carry penalties of up to three years in prison. Private ownership of electronic media is completely prohibited by the constitution, and foreign news agencies must hire local journalists only through government offices.

Although even with all these regulations in place, the Cuban authorities still distanced themselves from comments recently made on a radio station in Cuba. When broadcasting details of former U.S. President Ronald Reagan's death, the news said that Reagan, a staunch foe of Communism, "should never have been born." This report made headlines in the international community and caused general outrage. Subsequently, the Cuban government issued a statement saying that the radio station was not speaking on its behalf. Nevertheless, more often than not, the contrary is true: Cuban radio in fact speaks on behalf of Castro.

"In the beginning, the main purpose behind the introduction of a station called 'Radio Rebelde' was to advance the Socialist revolution—with rhythm— via "Socialismo con Pachanga," the latter a hybrid of conga and merengue."

Going Back A Few Years

In the beginning, the main purpose behind the introduction of a station called "Radio Rebelde" was to advance the Socialist revolution—with rhythm— via "Socialismo con Pachanga," the latter a hybrid of conga and merengue. Revolutionary hero Che Guevara created Radio Rebelde as a "soft weapon" against capitalism, broadcasting from a crude, secret transmitter. Today, Radio Rebelde is Cuba's principal station, and there are over four million radio sets nationwide.

There are radio stations in the 14 provinces of the country, and 30 municipalities also have stations that broadcast regional information. The six radio stations that are national in scope are Radio Rebelde; Radio Reloj, a 24-hour news station; Radio



Based on Havana's Infanta Avenue, Radio Havana Cuba's HQ is also home to Radio Progreso. Both stations have contributed greatly to the rich history of Cuban radio broadcasting.

Progreso (CMBC), which features varied programming; Radio Enciclopedia, which features mostly instrumental music; and Radio Musical Cubana (CMBF) and Radio Taíno, both of which offer programming in Spanish and English. Radio Habana Cuba is the only station in Cuba with international scope, broadcasting on shortwave for North, Central, South America, the Caribbean, the North of Africa, Near East, and Western Europe.

But before Cuba could speak to the rest of the world, radio was used to speak to its own people. Back in the 1950s, Guevara



Cuban radio has been known to act as a mouthpiece for President Fidel Castro ever since the launch of Cuba's first station, Radio Rebelde, the legacy of Castro and revolutionary hero Che Guevara.

radio. But, Castro was suitably impressed and, days later, on February 23, 1958, Radio Rebelde made its first official transmission: "Aqui Radio Rebelde! Aqui Radio Rebelde! Transmittiendo desde la Sierra Maestra en territorio libre de Cuba" (which roughly translates as "Here is Radio Rebelde! Here is Radio Rebelde! Transmitting from the Sierra Maestra mountains in the free territory of Cuba").

This was just the start of a clandestine revolutionary broadcasting network. Eventually, there would be 32 Rebelde stations scattered across Cuba. And it was Castro's powerful speeches, broadcast on Radio Rebelde, which led him to his current position as leader of the country. In directing the people to play a part in the revolution against the Batista regime, he promised that freedom was coming to Cuba. Of course, once in power, Castro began to lean towards Communism.

Radio Havana

Along with Radio Rebelde, another important station in the history of Cuban radio is Radio Havana Cuba, now in its 44th year of broadcasting. The station was born shortly after the ill-fated Bay of Pigs invasion in April 1961.

Castro announced, at the funeral of victims of the failed U.S.-backed venture: "Do they believe they will be able to hide it from the world?...no, Cuba already has

"Along with Radio Rebelde, another important station in the history of Cuban radio is Radio Havana Cuba, now in its 44th year of broadcasting."

a radio station which is broadcasting to all Latin America...being heard by innumerable brothers and sisters in Latin America and the world over." Shortly afterwards, in May 1961, Radio Havana Cuba began broadcasting in Spanish and English for two hours each day. Today the station broadcasts in French, Arabic, Creole, Portuguese, the South American Indian languages of Quechua and Guarani, and Esperanto, as well as its original two languages.

Radio Havana Cuba's output consists primarily of national and foreign news, praising the country's achievements, while highlighting the shortcomings of its giant neighbor. U.S. President George W. Bush is often the target of its criticism. According to the head of the Cuban parliament, Ricardo Alarcon, after more than 40 years, Radio Havana Cuba still maintains its "revolutionary desire to change the world." Station director Milagros Hernandez said the aim of the station is "to disseminate the best of Cuban and Latin American culture."

Cuba may have gained recognition for broadcasting radio signals, but for four decades it has also been associated with jamming radio signals! According to U.S. sources, Cuba has maintained sophisticated electronic intelligence, ranging from tapping U.S. phone conversations to jamming radio communications. Naturally, jamming is just the next step in Castro's controversial control over whatever is broadcast in Cuba. For example, U.S.-backed Radio Marti has been able to penetrate the island, yet still no clear TV Marti signals have reached Cuba since the service began in 1990. The Voice of America (VOA), which broadcasts to Iranian audiences, has also been jammed, and Cuba is the prime suspect in this obstruction. Moreover, Cuba has allegedly drafted proposals for a United Nations summit on information technology, promoting the legalization of jamming and state control of the media.

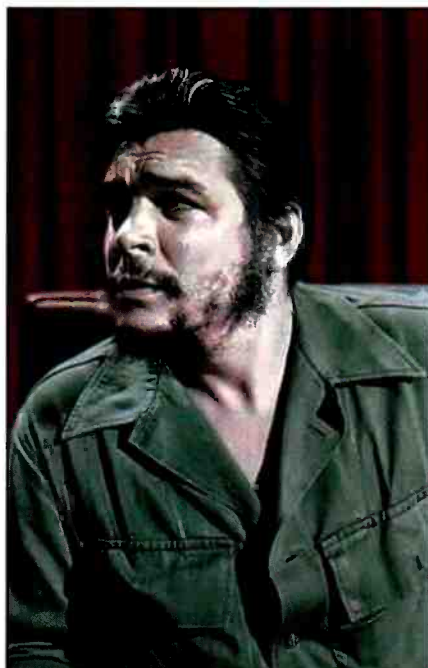
Ham Radio Thrives

Still, despite this image of Castro controlling every broadcast originating in

knew that a radio station was the only way to speak directly to the Cuban people. He rounded up a technician, a former newspaper reporter, and two ex-announcers from Havana's popular Radio Mambi to form his station's staff. They used an old ham transmitter to broadcast their messages. However, their first 20-minute broadcast only reached a few hundred yards, with only Castro and a few guerillas listening, huddled around Guevara's



Che Guevara created Radio Rebelde in 1958 to be used as a "soft weapon" against capitalism.



“Still, despite this image of Castro controlling every broadcast originating in Cuba, amateur radio is thriving in the country. The Cuban amateurs build and maintain most of their own equipment.”

Cuba, amateur radio is thriving in the country. The Cuban amateurs build and maintain most of their own equipment. In fact, their broadcasting capabilities are of tactical and strategic importance to the whole country, as demonstrated during Cuba’s last hurricane when some 450 radio amateurs provided the nation with critically needed communications. And when Hurricane Michelle swept Cuba in November 2001, telephone communication across the central part of the island was virtually non-existent. Then, too amateur radio bridged this gap in communication.

Perhaps if one of these radio amateurs seizes upon the enthusiasm once possessed by Radio Rebelde’s founder, Che Guevara, Cuba will again hear freely broadcast radio waves from a privately owned station. Then, and only then, will those infamous words of Radio Rebelde’s maiden broadcast become true: “Transmitting from the... free territory of Cuba.” ■

Cuban Radio Online

You can listen to Cuban Radio online at www.radio-rebelde.com.cu, www.radioprogreso.cu, www.radioreloj.cu, and www.radiohc.cu.

VHF Propagation

A guide For Radio Amateurs

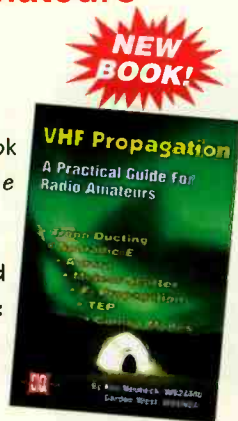
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Radio Havana Shortwave Schedule

All times are UTC; frequencies are in kHz

Time	Frequency
0000–0030	17705
0000–0100	9550
0000–0100	5965, 6000, 6060, 9505, 9600, 9655, 9820, 11760, 15230
0100–0130	9550
0100–0200	5965, 6060, 9505, 9600, 9655, 11760, 15230
0100–0500	6000
0130–0200	9550
0200–0300	5965, 6060, 9505, 9550, 9600, 9655, 11760, 15230
0300–0500	5965, 6060, 9505, 9550, 9600, 9655, 11760, 11875, 15230
0500–0700	6000, 6060, 9550, 9655, 9820, 11760
0700–0730*	6000, 9820
1100–1500	6000, 9550, 11760, 11800, 12000, 15230
1500–1530*	11760
1930–2000*	11760
2000–2030	11760
2000–2030	13660
2030–2100	13660
2030–2130	9505, 11760
2100–2300	9550, 15230
2130–2200	9505
2130–2200	11760
2200–2230	9505
2200–2230	17705
2230–2300	9505
2230–2300	17705
2300–2330	15230, 17705
2300–2400	9550
2300–2400	6000, 9820
2300–0100	6000, 11875
2330–2400*	9505, 9600
2330–2400	17705
2330–2400	15230

*Sundays



Located in an island paradise, but controlled by a Communist regime, Cuban broadcasters face strict rules imposed by Castro’s government.

A Lesson In Crypto For Two Radio Clubs With One Goal

Clubs Combine Forces To Spice Up Member Activity

by Murray Green, K3BEQ, K3BEQ@arrl.net



The National Cryptologic Museum is the National Security Agency's principal gateway to the public. It shares the nation's, as well as NSA's, cryptologic legacy and place in world history.

located near the headquarters of the National Security Agency, Fort George G. Meade, Maryland, about 20 miles north of Washington D.C. Some 50 club members attended, including some who work at, or have retired from the agency. So sit back, make yourselves comfortable, and follow in the footprints of their tour through these photos. (Many thanks go to the National Cryptologic Museum for the photographs and accompanying captions.)

The National Cryptologic Museum is the National Security Agency's principal gateway to the public. It shares the nation's, as well as NSA's, cryptologic legacy and place in world histo-

Radio club meetings can sometimes be repetitious; the reading of the minutes, going over old and new business, complaints and, well, you know what I mean. There are times when you simply have to get out of the clubhouse and see how the other half of the world lives. And that is where a good Activities Chairperson is so important, someone who can spice up member activity. In the case I'm going to relate, the spice turned out to be something different and a little off the beaten track.

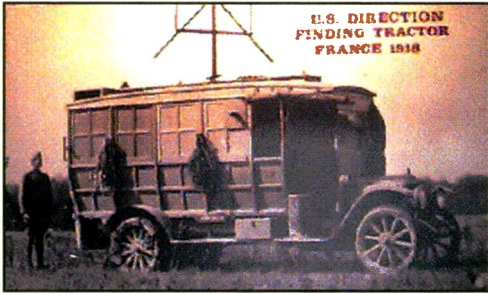
A Special Visit: The National Cryptologic Museum

A distinct advantage to residing in the Washington D.C. metropolitan area is the many excellent museums and other areas of interest. No wonder the region is listed in the top 10 most visited U.S. tourist attractions. The area also has many varied amateur radio clubs, including full service, repeater-oriented, DX, contesting, you name it. Two of them, the Green Mountain Repeater Association and the D.C. Metropolitan Amateur Radio Club, decided to combine forces and tour one of the many museums, with the stipulation that it be partially communications oriented. The museum that was finally selected was not even in existence 12 years ago; its future exhibits were still classified.

But things change, and so it happened that the two clubs mutually agreed to visit the National Cryptologic Museum,



Army cryptologists first went to the field during World War I. This site is a mock-up of the World War I Verdun intercept site in France, built by NSA craftsmen based on the two extant pictures of the original shack. Although signal intelligence was in its infancy, information was gained from direction finding, radio intercept, and decryption, and was used for tactical planning by the American Expeditionary Forces. Just as American combat troops in the "Great War" frequently had to fight with foreign equipment, their intercept activities also were conducted with foreign equipment; in this case, the radios are of French manufacture. (Courtesy National Cryptologic Museum)



During the early 1900s, the Army operated from mobile as well as fixed installations. The museum displays a picture of a mobile U.S. direction finding truck, or "tractor" in the terminology of the time. The truck had a DF antenna, which was turned by hand from the inside.

By measuring the angle of entry and the skip of a signal coming in and bouncing off the ionosphere, an operator could pinpoint the distance the radio wave had traveled—rather advanced for 1918. (Courtesy National Cryptologic Museum)

This enciphering and deciphering device was acquired from West Virginia by NSA in the early 1980s. It was first thought to have been a model of the "Jefferson cipher wheel," so called because Thomas Jefferson described a similar device in his writings. We believe it to be the oldest extant device in the world, but the connection with Jefferson is unproven. Such devices are known to have been described by writers as early as Francis Bacon in 1605 and may have been fairly common among the arcane "black chambers" of European governments. This cipher wheel was evidently for use with the French language, which was the world's diplomatic language up through World War I. How it came to be in West Virginia is unknown. (Courtesy National Cryptologic Museum)



ry. Located adjacent to NSA Headquarters, Ft. George G. Meade, Maryland, the museum's collection contains thousands of artifacts that collectively serve to sustain the history of the cryptologic profession. Here, visitors can catch a glimpse of some of the most dramatic moments in the history of American cryptology, the people who devoted their lives to cryptology and national defense, the machines and devices they developed, the techniques they used, and the places where they worked. For the visitor, some events in American and world history will take on a new meaning. For the cryptologic professional, it is an opportunity to absorb the heritage of the profession.

Originally designed to house artifacts from the agency and to give employees a place to reflect on past successes and failures, the museum quickly developed into a priceless collection of the nation's cryptologic history. It opened to the public in December 1993 and quickly became an area highlight.

The first and only public museum specifically related to the intelligence community, it hosts approximately 50,000 visitors annually from all over the country and all over the world, giv-



Surrounded by complex machines, the exhibit on code talkers appears out of place, but is actually a monument to the most complex machine of all—the human mind. Lacking secure battlefield voice communications during the Great War, the Army employed Choctaws to encrypt voice communications, using their native language, itself encoded. The Army studied the program even before war was declared in 1941, and during World War II employed Comanches, Choctaws, Kiowas, Winnebagos, Seminoles, Navajos, Hopis, Cherokees, and others. The Marine Corps took the Army work and codified, expanded, refined, and perfected it into a true security discipline, using Navajos exclusively. In campaigns against the enemy on many fronts, the Native American Code Talkers never made a mistake in transmission nor were their codes ever broken. (Courtesy National Cryptologic Museum)



On August 4, 1945, Soviet school children gave a carving of the Great Seal of the United States to U.S. Ambassador Averill Harriman. It hung in the ambassador's Moscow residential office until 1952 when the State Department discovered that it was "bugged." The microphone hidden inside was passive and only activated when the Soviets wanted it to be. They shot radio waves from a van parked outside into the ambassador's office and could then detect the changes of the microphone's diaphragm inside the resonant cavity. When Soviets turned off the radio waves it was virtually impossible to detect the hidden "bug." The Soviets were able to eavesdrop on the U.S. ambassador's conversations for six years. The replica on display in the museum was molded from the original after it came to NSA for testing. The exhibit can be opened to reveal a copy of the microphone and the resonant cavity inside. (Courtesy National Cryptologic Museum)



On exhibit in the museum are two Cray supercomputers. The XMP-24 on display is the upgrade of the original XMP-22, which was the first supercomputer Cray ever delivered to a customer site. It was in operation from 1983 to 1993 and was arguably the most powerful computer in the world when it was delivered. It used serial processing to conduct 420 million operations per second. The second generation Cray, the YMP, replaced the older version in 1993. It had a 32-GB (32 billion bytes) memory capacity. In 1993 most personal computers held only 16 million bytes. The YMP used vector processing, a very powerful form of overlapping, parallel processing, to conduct 2.67 billion operations per second. The YMP was decommissioned and went on display at the museum in 2000. NSA, with its partners in industry, continues to be a leader in research and development of computer technologies, pioneering the frontiers of computer science and engineering. To house and develop these new systems, NSA has the world's largest supercomputing facility and the Special Processing Lab is located on its campus. (Courtesy National Cryptologic Museum)

ing them a peek into the secret world of code making and code breaking.

Here you see just a brief glimpse of some of the museum's exhibits. Hopefully it will serve as an incentive for other clubs and their activity chairpersons to take a close look at what facilities they have in their local areas. They may be surprised at the

many interesting places to visit that are free to the public. Indeed, according to the American Association of Museums, there are nearly 16,000 museums throughout the nation. Some 1,330 can be searched by state at <http://icom.museum/vlmp/usa.html>. Use Internet search engines to search for others. Give it a try. You won't be disappointed.

I'd also encourage club officers and activity chairpersons to read the excellent ARRL *Active Club Online Primer* that covers virtually every aspect of club organization and how to maintain member interest. It's a must-read and can be found at <http://www.arrl.org/FandES/field/club/cpw/cpw.html>. ■

Some information in this article appeared in the November 2004 QST.

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Dimensions: 6.7"L x 6.5"H x 2.5"W Weight: 11lbs. 5oz.
Power Source: Hand-Crank Power Generator with rechargeable battery pack, 3 AA batteries (not included) or AC adaptor (not included)



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Rotators Snapped, Aluminum Bent, And A Roof Destroyed...But It Could Have Been Much Worse!

by Gordon West, WB6NOA

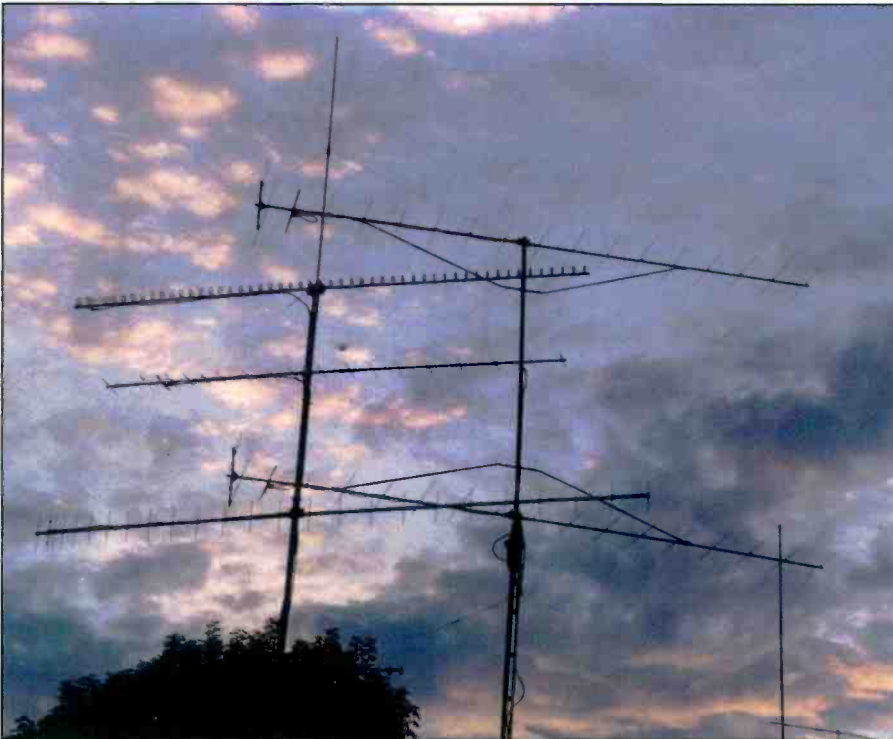
When the massive cold front moved in on Southern California during the holiday week after Christmas, ham operators and members of SKYWARN were glued to the computers at www.wunderground.com watching the approaching powerful storm cells. I knew we were in for a good blow, but I had no idea an embedded waterspout would turn into a tornado as it came ashore two miles away from my house! All my towers were cranked down, and we were prepared for a major downburst, but never expected an 80-mph tornado to blow through.

Just after midnight, the waterspout-turned-tornado took a straight track through the house. The Davis anemometer hit 80 before the tower came crashing down. The second tower bent like a pretzel, but luckily my stack of 2-meter-long boomers survived with only a row of bent elements and a major bend on the main mast. Surprisingly the Tailtwister rotor on the outside of the tower did *NOT* snap off.

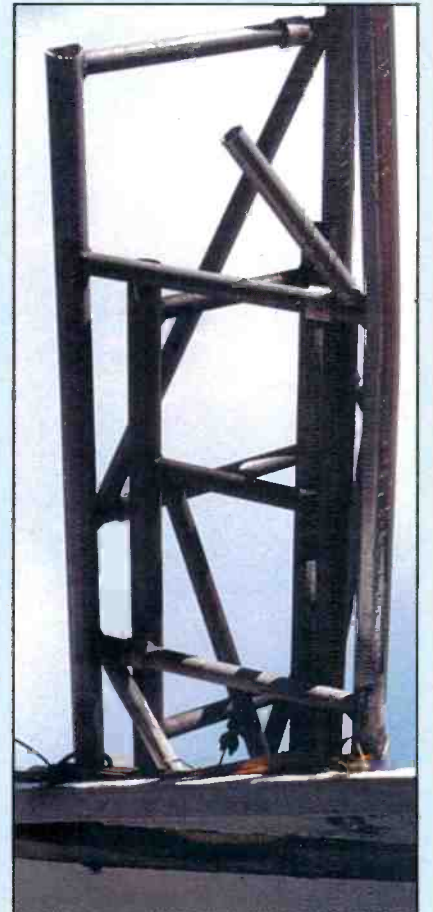
My pole-full of satellite and microwave antennas *did* snap the rotator, and at the same time, another steel mast went horizontal just as the winds ripped off half of the shingles. Both towers had clear evi-



After the tornado...rotator failure!



Here are Gordo's VHF/UHF antennas before the storm.



Good-bye radio tower after the freak California tornado.

Being Ready

Mother Nature's fury can happen anywhere, anytime, but there are things you can do to be prepared. Of course antennas, cables, and towers can always be replaced! Here are a few simple tips:

- Always have a NOAA All Hazards radio operating in your home or office. Encourage local schools and stores to have them, too. They give excellent warnings that can save lives!
- Keep extra batteries and flashlights ready to go *AND* in a place where they're accessible to everyone in the house.
- Disconnect your antennas and unplug your equipment when storms are in your area.
- Have your scanner preprogrammed with emergency frequencies. When a storm is in the area it's a little late to program the radio!
- Make sure you have an emergency portable AM/FM/shortwave radio, either the crank-type or battery operated, and make sure the batteries are fresh.
- When the cell systems are down, you'll still want to be able to communicate with the outside world. Good bets are those small FRS or GMRS radios, handheld ham 2-meter HTs, and CB. For long-haul communications think about a small QRP (low-power) ham transceiver.
- Equip your monitoring post with a couple battery packs; they'll power a low-wattage light for hours or that HT for a couple of days, if necessary!



Southern California twister damage on the roof.



The Tailtwister rotor survived, but the mast couldn't hold up to the 80-mph twister.

dence of "twist and snap," even though they were both guyed and well secured.

Eighty Miles Away...

Eighty miles away in San Diego, over 40 ham operators lost *their* antennas in tornado-like wind. And just north of Los Angeles, another tornado touched down and wiped out even more ham radio rooftop aluminum.

I was able to immediately put up a distributed capacity dipole for 40 meters and got back on the air with our ARES Orange County net, and I had many on-air conversations with hams who were immediately able to get back on the air with their own emergency antenna systems.

For those folks in Southern California, we now have an even greater respect for the *REAL* tornadoes that hit the central and eastern states. Ours was little more than a waterspout on land, but it made us realize that what *should not* come down *will* come down when twisters zero in on your house.

This also proves the value of Internet links on VHF and UHF to fill in where HF hardware has been damaged—witness all the traffic coming out of Asia after the tsunami.

Are You A Weather Watcher?

Hams are always at their best when conditions go bad, but if you've been affected by Mother Nature, I'd like to hear from you and see the photos; maybe we'll publish them right here in *Pop'Comm!* Write to me at *Popular Communications*, 25 Newbridge Road, Hicksville, NY 11801. ■

Capitol Hill And FCC Actions Affecting Communications

Florida CB'er Fined \$10,000

A Jacksonville, FL man has been fined \$10,000 by the FCC for operating a Citizen's Band radio station without FCC authorization. Tommie Salter was directed by the Commission in March 2004 to restrict his hours of operation in response to complaints of interference.

The FCC subsequently advised Salter that he could resume normal operation of his station as long as his transmissions complied with FCC standards. Again, however, the Commission received interference complaints in July and sent an Official Notice restricting Salter from operating between 6 AM and 11:59 PM.

According to the FCC, Salter said that although the notice was received at his residence and signed for by a family member, it "wound up in his 'FCC file' unread."

On August 10, agents from the Commission's Tampa office tracked the source of a CB signal to Salter's residence at 9:59 AM. and subsequently "observed that Mr. Salter was operating a CB transmitter that was not FCC certified for CB radio use."

The FCC's fine was announced in December.

Congress Lauded For Public Safety Legislation

The U.S. Congress has been commended by the Association of Public-Safety Communications Officials (APCO) for its passage of two pieces of legislation to improve public safety. Cited were the National Intelligence Reorganization Act (S.2845) and the Enhance 9-1-1 Act of 2004 (HR 5419).

APCO said, "Title VII of S.2845 sets the stage for DTV (Digital TV) band clearing legislation to pass in 2005. The bill includes a commitment by Congress for several provisions regarding studies of public safety spectrum needs and interoperability grant funding"

Legislation authorizing state grants to improve emergency 9-1-1 services is included in HR 5419. According to APCO, "the bill authorizes \$250 million in grants only be used for the implementation and operation of phase II enhanced 9-1-1 (E9-1-1) services."

"We congratulate those public safety professionals who worked hard to get these bills passed," APCO International President Greg Ballentine said in a statement. "We commit that APCO International will continue to monitor this through the appropriations process to ensure that the promised funding actually reaches public safety communications centers."

Satellite Radio Gains Subscribers

The two major players in satellite radio—Sirius and XM—posted significant subscriber gains last year, the companies announced as they closed the books on 2004.

XM, based in Washington, D.C., said that by year's end it had more than 3.1 million subscribers. It started 2004 with 1.3 million subscribers.

New York-based Sirius said it had more than 1 million subscribers, up from 260,000 at the beginning of 2004.

In a deal worth about \$500 million, in October Sirius signed controversial radio personality Howard Stern. Sirius has also reached a deal with the NFL. In the meantime, XM made an 11-year agreement with major league baseball for \$650 million.

FCC Fines Missouri Radio Amateur

The FCC has issued a \$4,000 Notice of Apparent Liability for Forfeiture to Paul D. Westcott, KCØOAB, of Purdy, MO, for allegedly failing to reply to a Commission Inquiry Letter and Warning Notice following complaints that his station "operated 24 hours a day, seven days a week, and interfered with Amateur communications due to an apparent lack of station control."

In June 2004 the Commission requested information from Westcott, and after reviewing his response, issued a Warning Notice and Request for Additional Information (Inquiry Letter). After receiving no response, the Enforcement Bureau issued a Warning Notice—Failure to Reply.

"To date Mr. Westcott has not responded to either the Inquiry Letter or the Warning Notice," the FCC announced in November. The Commission concluded that Westcott "apparently willfully and repeatedly failed to respond to Commission correspondence requesting information about his station."

Delphi Adds Repeater To Its Satellite Line-up

The Delphi XM Signal Repeater, which can wirelessly rebroadcast XM's satellite radio signal throughout homes and offices, is being added to the Delphi Corporation's product line.

The repeater system consists of both a receiver and transmitter module and is capable of approximately 75- to 100-foot coverage through interior walls and floors. The transmitter down-converts the XM signal through an XM home or audio system antenna for rebroadcast.

The signal repeater "eliminates the need for long and unsightly antenna extensions," Joseph A. Damato, Delphi's director of consumer electronics, said.

With a spring 2005 debut in consumer electronics stores, the system is expected to have a retail price of \$169. Additional receive modules will cost \$69 each.

Radio Club To Be Contacted During BPL Trial

In what is believed to be one of the first directives of its kind, a company conducting BPL field trials has been required by the FCC to keep in contact with an area amateur radio club.

Electric Broadband LLC "must establish and maintain a liaison relationship with Verde Valley Amateur Radio Association"

during the company's BPL field trial in Cottonwood, AZ, according to the *ARRL Letter*, issued by the American Radio Relay League.

"Our BPL committee in Cottonwood was surprised to see this stipulation," the VVARA's Robert Shipton, K8EQC, said. "Time will tell if it really matters or not." Shipton said this might be the first time the FCC has ever imposed such a requirement. Electric Broadband has been issued experimental license WD2XMB for the trial.

On two occasions the ARRL has asked the FCC to terminate the Cottonwood BPL trial. "League personnel conducting testing of the Cottonwood system this past summer found 'extremely high' levels of radiated RF energy on amateur HF bands at the time," the ARRL stated.

Harris Corp. Awarded Army Contract For HF Radios

Harris Corp. has been awarded radio and service contracts for more than \$30 million by the U.S. Army for the Falcon® II radio.

The corporation, based in Melbourne, FL, which supplies secure, tactical radios for defense forces worldwide, is providing the Army high-frequency AN/PRC-150 radios in man packs and vehicles.

"The reliability of the AN/PRC-150 has been repeatedly proven in combat, and this order reflects the U.S. Army's confidence in this radio's battlefield performance and Harris's support

in theatre," Dana Mehnert, vice president and general manager of business development and operations, Harris, RF Communications Division, said in a January statement.

The radios will be sent to support operations in Iraq and Afghanistan, in addition to the Army's Modularity program. The AN/PRC-150 is the only HF radio with embedded communications security "that has been certified for transmission of U.S. classified information," Harris Corp. said in a statement. It continued, "Along with the Harris AN/PRC-117F multiband, multimission radio, the AN/PRC-150 has provided the mainstay of tactical Beyond Line of Site (BLOS) radio communications for U.S. forces deployed in Operation Iraqi Freedom and Operation Enduring Freedom."

Sirius To Be Factory-installed By Ford

In a move that is expected to generate up to a million satellite radio subscribers, Ford Motor Co. has announced it will include factory-installed Sirius Satellite radios in many of its models for the 2006 and 2007 model years.

The F-150 pickup, Explorer SUV, Lincoln Mark LT sedan, and Mercury Mountaineer SUV will have Sirius installed as an option for 2006. Seventeen additional Ford models will have Sirius satellite radio installed for the 2007 model year. About 80 percent of Ford's line will offer factory-installed Sirius satellite radios.

XM Satellite Radio, Sirius' biggest competitor, has partnerships with General Motors and Honda Motor Co. ■

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Reviewing Propagation And Space Weather Terms—Part III

The Interplanetary Magnetic Field (IMF)

This month we'll look at the interplanetary magnetic field, or IMF, and learn how it affects space weather. The Sun, and each planet, has a magnetic structure, and of course the Earth has a north pole and a south pole. Magnetic-field lines run from pole to pole, forming a donut shape of magnetic flux energy. The Sun has a magnetic structure, as well. It can become quite complex, with several *intertwined* poles. The Sun even *reverses* its north and south pole each solar cycle.

The Sun's magnetic field permeates the entire solar system, and beyond. This region, which stretches from the Sun outward past the end of the solar system, is called the *heliosphere*. The magnetic field that originates in the Sun and stretches out through the heliosphere is called the *interplanetary magnetic field*. The IMF interacts with the Earth and is a primary cause of space weather.

The IMF sprawls out away from the Sun in the form of a huge "current sheet," a vast expanding surface where complex magnetic-field lines run from one solar pole far out into the solar system, arching back again along this sheet to return to the Sun's other pole. These magnetic field lines therefore have polarities that change from north (plus) to south (minus). An IMF flux line that is oriented "northward" is one oriented toward the Sun, while one oriented "southward" is one directed away from the Sun. The huge solar current sheet that expands away from the sun is 10,000 km thick and extends past the orbit of Pluto! The entire heliosphere is organized around this giant sheet, which carries an electrical current that is about 16 orders of magnitude less than that of the current carried in an ordinary light bulb.

Ordinarily, the current sheet circles the Sun's equator, spreading out in a wavy sheet that might be said to resemble a dancer's

The Ap Index And Understanding Propagation Terminology

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

Classification of A-indices is as follows:

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

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

Ionosphere: A collection of ionized particles and electrons in the uppermost portion of the Earth's atmosphere, which is formed by the interaction of the solar wind with the very thin air particles that have escaped Earth's gravity. These ions are responsible for the reflection or bending of radio waves occurring between certain critical frequencies, with these critical frequencies varying with the degree of

ionization. As a result, radio waves having frequencies higher than the Lowest Usable Frequency (LUF) but lower than the Maximum Usable Frequency (MUF) are propagated over large distances.

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

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

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

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

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

skirt that flies up while the dancer is spinning around. As Earth orbits the Sun, it dips in and out of the main structure of this wavy current sheet. On one side of this sheet, the Sun's magnetic field lines point northward, or toward the Sun. On the other side they point southward, or away from the Sun.

South-pointing solar magnetic-field flux lines tend to connect with Earth's own magnetic field (think of holding two bar magnets together, with one bar magnet's north pole against the other bar's south pole). Solar-wind energy can then penetrate the local space around our planet and fuel geomagnetic storms. (We report IMF orientation using the B_z [B sub Z] index. When the B_z is negative, it indicates a southerly oriented IMF.)

Each solar cycle, the Sun *reverses* its main polarity. During Cycle 23, the Sun's flip in March 2000 caused the predominant orientation of the IMF to be negative. This has contributed to the more geomagnetically stormy decline of this cycle as compared with the last solar cycle.

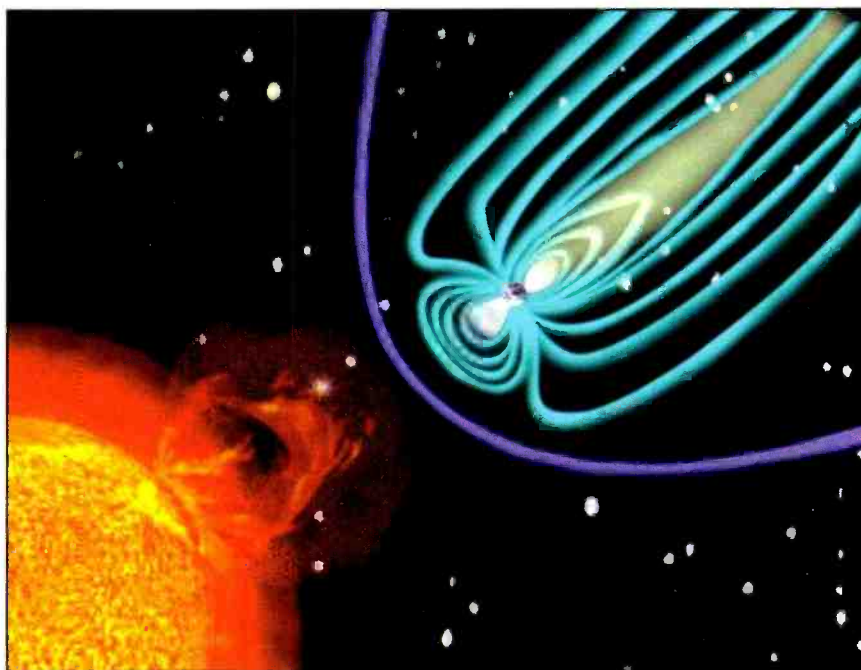
Solar Wind

Riding the IMF is the solar wind. The Sun is a huge ball of energy. A great amount of that energy is released out away from the Sun through various events and mechanisms. Solar flares, coronal mass ejections (CMEs), and coronal holes are just some examples of the release of energy and material from the Sun out into the heliosphere.

Have you seen a water sprinkler that has a rotating arm consisting of many little holes through which water is sprayed in small jets? These water jets cause the arm to rotate in a continuous circle. As you watch this rotation from above, you can see the water spreading outward in an expanding, arching spiral. The material spewing out, away from the Sun, resembles this arching. Because the Sun is rotating, solar material (i.e., plasma and protons) will arch out away from the Sun, riding on the magnetic field lines of the IMF and current sheet.

Space Weather And The Earth

As the Earth moves through the solar wind and the IMF, clouds of solar plasma and material bombard the magnetosphere. Depending on the orientation of the IMF at the given moment, that material may or may not penetrate into our atmosphere. Whenever a reconnection



An artist's view of a coronal mass ejection (CME) heading toward the Earth. As the cloud of plasma riding the solar wind and interplanetary magnetic field (IMF) reaches the magnetosphere, there is great compression as the magnetosphere opposes the shock wave. (Source: NOAA/SEC)

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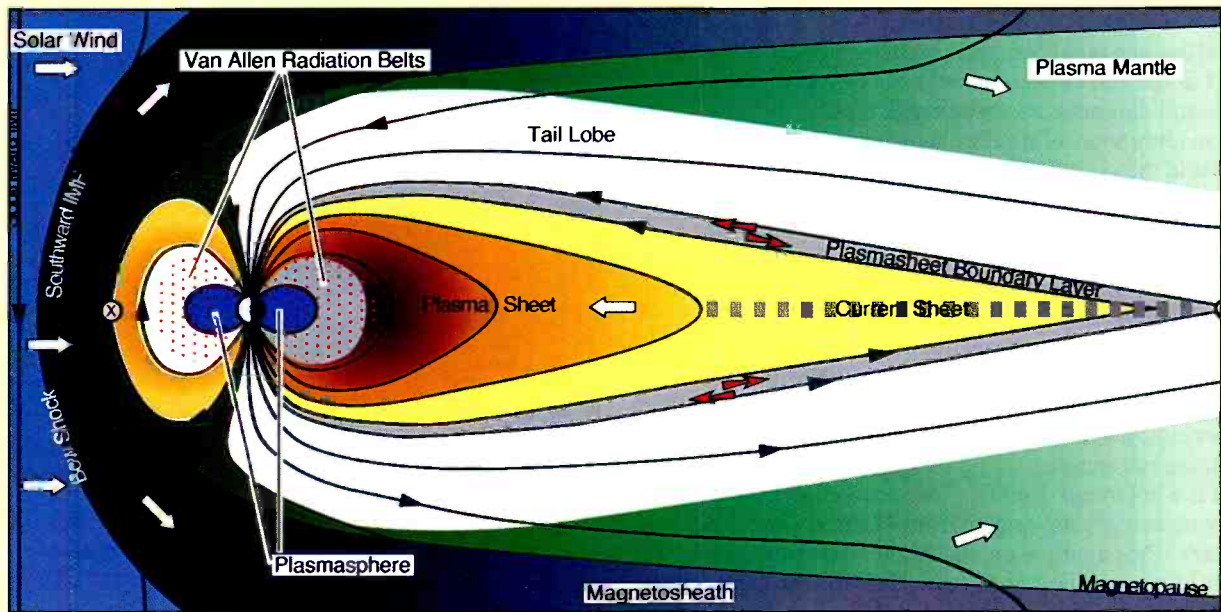
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Optimum Working Frequencies (MHz) - For April 2005 - Flux = 82, SSN = 23- Created by NW7US

UTC	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
TO/FROM US WEST COAST																									
CARIBBEAN	22	22	22	20	18	17	15	14	13	12	12	11	11	13	16	18	19	20	21	22	22	22	23	23	
NORTHERN SOUTH AMERICA	28	28	28	25	23	21	19	18	17	16	15	14	14	15	19	21	23	24	26	27	27	28	28	28	
CENTRAL SOUTH AMERICA	29	26	24	22	20	18	17	16	15	14	14	15	15	17	21	24	26	27	29	29	30	30	30	29	
SOUTHERN SOUTH AMERICA	27	24	22	20	18	17	16	15	14	14	13	13	14	15	17	21	23	25	27	28	29	30	30	29	
WESTERN EUROPE	15	12	10	9	13	15	11	10	9	9	11	15	16	17	18	19	19	19	18	18	17	17	16		
EASTERN EUROPE	9	9	9	8	12	15	15	13	10	9	13	15	16	17	17	18	18	17	16	15	14	10	10		
EASTERN NORTH AMERICA	25	24	23	22	20	18	17	15	14	13	13	12	14	18	20	22	24	25	25	26	26	26	26		
CENTRAL NORTH AMERICA	14	14	13	13	12	11	10	9	8	8	7	7	8	10	12	13	13	14	14	14	14	15	14		
WESTERN NORTH AMERICA	8	7	7	7	7	6	5	5	4	4	4	4	3	3	5	6	6	7	7	7	7	8	8		
SOUTHERN NORTH AMERICA	24	23	23	22	21	19	17	16	15	14	13	12	11	12	15	18	19	21	22	23	23	24	24		
NORTHERN AFRICA	13	12	12	11	10	10	11	10	10	9	9	14	16	18	18	19	20	20	20	19	17	16	14		
CENTRAL AFRICA	16	15	14	13	13	13	10	10	9	9	10	14	16	17	18	19	19	20	20	20	20	19	18		
SOUTH AFRICA	18	17	16	15	14	14	15	14	13	12	12	11	17	20	21	23	24	24	25	25	25	23	21		
MIDDLE EAST	11	10	10	10	15	16	14	12	10	9	12	15	16	17	18	18	19	19	18	16	14	13	12		
JAPAN	20	21	20	20	19	19	17	16	13	12	11	10	10	9	11	11	10	10	13	16	18	19	20		
CENTRAL ASIA	21	21	20	20	19	19	17	16	13	12	11	10	10	9	9	14	16	15	14	13	13	14	17		
INDIA	16	17	17	17	17	16	16	15	13	10	9	12	12	9	9	9	9	8	8	10	13	14	15		
THAILAND	17	19	20	20	19	18	17	16	13	11	10	10	9	9	12	16	17	17	16	15	14	13	12		
AUSTRALIA	27	28	30	30	30	29	28	26	23	21	20	18	17	16	15	14	16	15	14	14	15	20	23		
CHINA	19	20	20	19	18	17	16	13	11	10	10	9	9	13	12	11	11	10	10	10	14	17	18		
SOUTH PACIFIC	31	31	31	30	30	29	27	24	21	20	18	17	16	15	14	14	13	13	13	21	25	27	29		
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TO/FROM US MIDWEST																									
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WESTERN EUROPE	14	10	10	9	9	11	10	10	9	9	14	16	17	18	19	20	20	19	19	18	18	17			
EASTERN EUROPE	10	9	9	9	11	10	10	9	9	9	14	16	17	18	19	19	19	18	17	17	16	14			
EASTERN NORTH AMERICA	18	18	17	16	14	13	12	11	10	10	9	9	11	13	15	16	17	18	18	19	19	19	19		
CENTRAL NORTH AMERICA	8	8	8	7	7	6	6	5	5	4	4	4	4	6	7	7	8	8	8	9	9	9			
WESTERN NORTH AMERICA	14	14	14	13	12	11	10	9	9	8	7	7	8	10	12	13	13	14	14	15	15	15			
SOUTHERN NORTH AMERICA	17	16	16	15	14	13	12	11	10	9	9	8	8	10	12	13	14	15	16	16	17	17			
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SOUTH AFRICA	18	17	16	15	14	14	14	17	16	15	15	17	21	24	26	28	29	30	29	27	25	23			
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JAPAN	20	20	20	19	18	16	14	12	11	10	10	9	13	12	11	10	10	10	13	16	18	19			
CENTRAL ASIA	20	20	19	19	18	16	13	11	11	10	10	9	10	15	17	18	16	15	14	13	13	17			
INDIA	11	13	14	15	15	14	10	10	9	9	12	15	16	15	15	14	13	11	9	9	8	8			
THAILAND	17	19	19	18	17	16	13	11	10	10	9	9	14	16	17	18	19	17	16	15	14	13			
AUSTRALIA	28	29	30	30	29	27	25	22	21	19	18	17	16	15	16	17	16	15	14	14	16	21			
CHINA	19	19	19	18	17	16	13	10	10	10	9	9	14	15	13	12	11	10	10	10	9	14			
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TO/FROM US EAST COAST																									
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NORTHERN SOUTH AMERICA	23	23	21	19	18	16	15	14	13	12	12	11	13	15	17	18	20	21	22	22	23	23	23		
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SOUTHERN SOUTH AMERICA	26	23	21	20	18	17	16	15	14	14	13	13	17	20	22	24	25	26	27	28	29	29	28		
WESTERN EUROPE	12	11	10	10	9	9	10	9	9	12	15	16	18	19	19	20	19	19	19	18	17	16			
EASTERN EUROPE	12	10	9	10	11	11	10	10	9	13	16	17	19	19	19	19	19	18	18	17	17	16			
EASTERN NORTH AMERICA	9	8	8	7	7	6	5	5	5	4	4	5	6	7	7	8	8	9	9	9	9	9			
CENTRAL NORTH AMERICA	19	18	18	16	15	14	13	12	11	10	10	9	12	14	16	17	18	19	19	20	20	20			
WESTERN NORTH AMERICA	25	25	24	22	20	18	17	16	15	14	13	12	14	18	20	22	24	25	26	26	26	26			
SOUTHERN NORTH AMERICA	20	20	19	18	16	15	14	13	12	11	10	10	11	13	15	17	18	19	20	20	21	21			
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SOUTH AFRICA	18	17	16	15	14	14	14	16	15	16	19	22	24	26	27	28	29	29	27	25	23	21			
MIDDLE EAST	15	14	13	13	12	11	11	10	10	12	15	17	19	20	21	21	21	21	21	21	19	18			
JAPAN	20	19	18	16	13	12	11	11	10	10	9	14	13	12	12	11	10	10	9	13	16	19			
CENTRAL ASIA	19	18	17	15	12	11	11	10	10	9	11	15	17	18	19	18	16	15	14	13	13	16			
INDIA	9	9	8	8	11	11	10	10	9	12	15	17	18	18	17	17	16	16	15	13	11	9			
THAILAND	16	18	16	13	11	11	10	10	9	10	15	17	18	19	20	20	19	18	16	15	14	13			
AUSTRALIA	28	30	29	28	26	24	22	20	18	17	16	15	15	18	17	16	15	15	14	13	17	21			
CHINA	19	18	17	14	12	11	10	10	9	9	14	16	18	17	14	12	11	11	10	10	9	13			
SOUTH PACIFIC	30	30	29	28	25	23	21	18	17	16	15	14	14	13	13	12	12	20	24	27	28	29			



Schematic of the Earth's magnetosphere, with principal particle regions (adapted from T. W. Hill). The direction to the Sun is to the left. The interplanetary magnetic field, imbedded in the solar wind, impinges upon the magnetopause. If it is southward, as here, it connects to the Earth's magnetic field at the X-line (shown as a circle with X inside), resulting in a region of field lines connecting from the Earth to deep space. Plasma from the solar wind enters via the cusp, becomes trapped in the plasma sheets, and eventually precipitates to Earth or is lost down the magnetotail. (Source: NASA)

occurs between the Sun's magnetic field lines and Earth's, solar materials can rain into our atmosphere. This material will align with the Earth's magnetic-field lines and ride these downward toward our two magnetic poles. This spawns aurora.

The IMF and the pressure of the solar wind always influence the magnetosphere. Whenever the solar wind speed increases, the magnetosphere become more compressed on the side facing the Sun. On the other side of the Earth, the magnetosphere will be stretched far out, away from the Sun. As the speed of the solar wind decreases, the magnetosphere will decompress. Whenever this compression and decompression happens in rapid waves, electrical currents are generated in the Earth's magnetic fields. This causes geomagnetic disturbances.

Geomagnetic storms cause a degradation of shortwave radio signal propagation as a result of ionospheric recombination. This recombination is similar to what takes place during the hours of darkness, with a lowering of the frequencies each ionospheric layer can refract.

On the other hand, a stormy geomagnetic field can spark auroras, which can support aurora-mode VHF propagation. Geomagnetic storms can cause long-term (hours to days) degradation, or depression, of the maximum usable frequencies

(MUFs), reducing the critical frequencies by as much as 50 percent of normal.

We saw quite a dramatic example of all of these dynamics during the geomagnetic storm period of 15–20 January 2005. A series of strong solar flares, ranging from M- to X-class in intensity, unleashed a series of coronal mass ejections directed squarely toward the Earth. When the massive plasma clouds arrived at the Earth, after riding the IMF at a speed exceeding 1500 kilometers per second, it caused very strong compression of the magnetosphere and spawned severe geomagnetic storms. This caused a general degradation of worldwide shortwave propagation, but spawned great visual aurora. VHF enthusiasts enjoyed the propagation off of the aurora-induced E-layer ionization.

Current Cycle 23 Progress

The Royal Observatory of Belgium reports that the monthly mean observed sunspot number for December 2004 is 18, a huge drop from November's 43.7. The lowest daily sunspot value during December, recorded on December 15, was 8. The highest daily sunspot count was 32, recorded on December 1. These high and low marks are significantly lower than the spread in November. The 12-

month running smoothed sunspot number centered on June 2004 is 44, down three tenths from May's 44.3. A smoothed sunspot count of 30 to 33 is expected by the SIDC for April 2005. The SEC predicts the sunspot count to be 20, give or take about 12 points.

The Dominion Radio Astrophysical Observatory at Penticton, BC, Canada reports a 10.7-cm observed monthly mean solar flux of 94.6 for December 2004, a bit lower than November's 113.2. The 12-month smoothed 10.7-cm flux centered on June 2004 is 107.2, just down from May's 109.2. The predicted smoothed 10.7-cm solar flux for April 2005 is about 82, give or take about 16 points.

The observed monthly mean planetary A index (Ap) for December 2004 is 11, a nice drop from November's 26. The 12-month smoothed Ap index centered on June 2004 is 14, about the same as for May. Expect the overall geomagnetic activity to be quiet to active during most days in April, with some isolated periods of storm level activity, since we are in the equinoctial season.

HF Propagation—Great DX Openings!

As we move into spring in the Northern Hemisphere, we experience great DX

openings from around the world on the high frequencies. This is because the Sun is mostly overhead over the equator, creating equal day and night periods in both hemispheres. The Vernal Equinox at the end of March marks the day when the hours of daylight and darkness are about equal around the world. This creates an ionosphere of similar characteristics throughout more of the world than is possible during other times when it is summer in one hemisphere and winter in the other and there are extreme differences in the ionosphere. This equalization of the ionospheric which takes place during the equinoctial periods (autumn and spring) is responsible for optimum DX conditions and starts late in February and lasts through late April.

The improvement in propagation is most noticeable on long circuits between the Northern and Southern Hemispheres. During this season conditions are also optimum for long-path and short-path openings, and during gray-line twilight periods associated with sunrise and sunset.

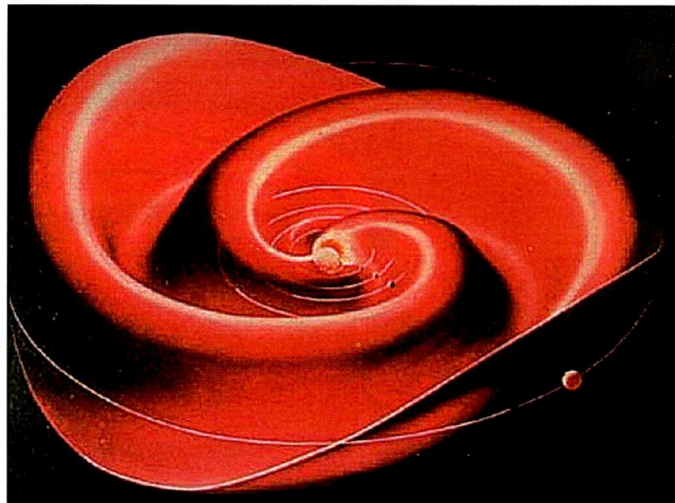
April is a hot month for DX. The seasonal change plays out on HF, with activity moving up from 41 meters and down from 11 meters. Propagation on the higher HF frequencies (19 through 11 meters) begins to suffer late in April and into the summer months due to lower MUFs in the Northern Hemisphere. MUFs peak very late in the day during the summer. Summertime MUFs are lower due to solar heating, which cause the ionosphere to expand. An expanded ionosphere produces lower ion density, which results in lower MUFs. Short-path propagation between countries in the Northern Hemisphere will drop out entirely. Higher frequency propagation peaks in the fall. April and May are fall months in the Southern Hemisphere, making long-path DX possible. Short-path propagation from South America, the South Pacific, and other areas south of the equator will be strong and reliable when open. However, these do not happen every day on the higher frequencies.

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

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

Spring—The Season Of Aurora

Spring is also the season of aurora. Will we see a lot of aurora in April? As you might remember from past columns, each solar cycle tends to have *two* peak periods of geomagnetic activity in its 11-year cycle. The second peak is always a stronger, more intense period in which we witness frequent coronal holes, coronal mass ejections, and strong flare activity. We are well into the decline phase of solar Cycle 23 and may have finally passed the second geomagnetic activity peak of this cycle. However, I expect a moderate-to-high level of solar activity that may continue to keep the geomagnetic field at active to minor storm levels. This is because of the shedding of the Sun's complex magnetic structures, typical of a solar-cycle decline, combined with



Material from the Sun spirals away into the heliosphere in a complex current sheet. This spiral includes the IMF. (Source: NASA)

the current orientation of the Sun's magnetic poles, which were reversed, as explained earlier in this month's column.

If my prediction holds true, this possible geomagnetic storminess will fuel a fair amount of aurora. And for VHF weak-signal enthusiasts, this could be an active radio aurora season. However, this same increase in geomagnetic storminess will cause a general degradation of shortwave radio propagation, since such activity causes the ionosphere to lose energy. This weakens the ionosphere, causing the maximum usable frequencies to fall by as much as 30 percent on a given signal path (say, between Australia and the eastern United States).

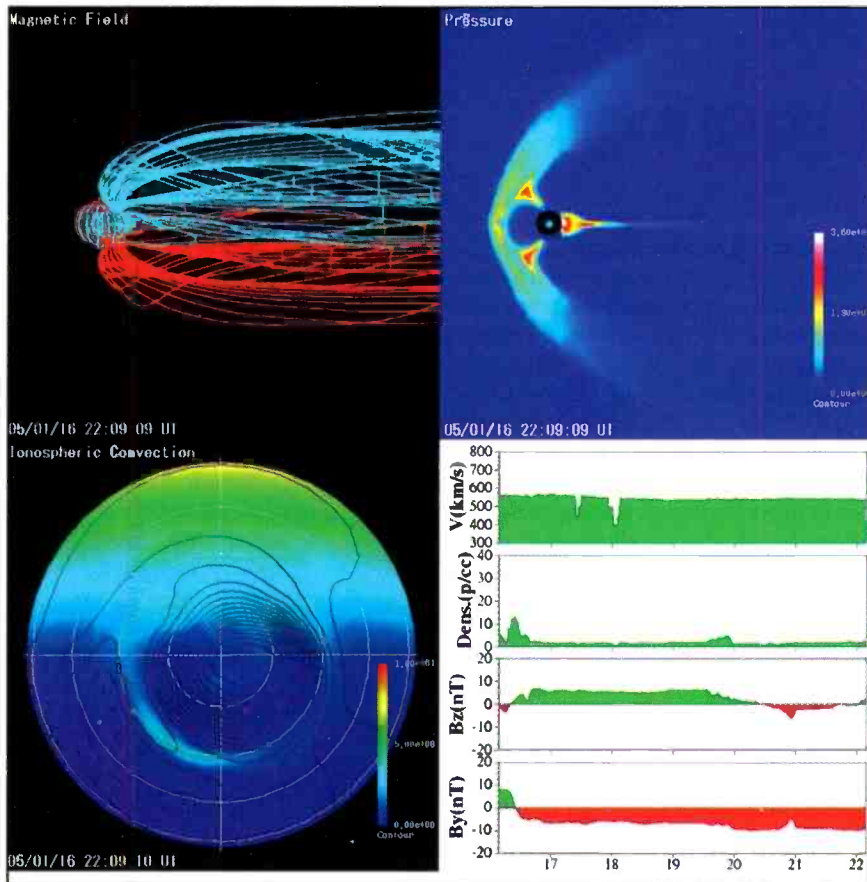
Geomagnetic storms that ignite auroras occur more often during the months around the equinoxes in early autumn and spring. This seasonal effect has been observed for more than 100 years. Scientists are still puzzled about all of the reasons, but they have a wealth of research from which they've developed models to help understand the phenomenon.

VHF Ionospheric Openings

On VHF, many different types of propagation modes can appear once or twice during April. Combination propagation modes may be possible on VHF, making for some exciting openings. Aurora is highly likely, as is an increase in trans-equatorial (TE) propagation. On days of high solar flux, there might be F2-mode VHF openings. Sporadic-E will become more common as we move into late spring and summer. There are times when sporadic-E, TE, and F2-layer propagation modes will link, providing strong DX openings on VHF between North America and New Zealand, Australia, or other areas.

If there are enough solar particles flowing down the Earth's magnetic-field lines and colliding with atmospheric atoms and molecules, ionization occurs. This ionization may be sufficient to reflect VHF and lower UHF radio waves, generally between 25 and 500 MHz. This usually occurs in conjunction with visual aurora, but the mechanism is a bit different and it is possible to have one (visual or radio) without the other.

Using radio aurora, the chances of contacting stations over greater distances than would ordinarily be possible on the VHF frequencies are increased. Like its visual counterpart, radio



These two images model the magnetosphere under a moderate solar wind speed (550 km/s) and a very fast solar wind speed (800+ km/s). The compression of the magnetosphere causes the ionosphere to recombine, causing the maximum usable frequency (MUF) on a given path to become depressed by as much as 30 percent. (Credit: Simulator Group, Applied Research and Standards, Division/Communications Research Laboratory/Koganei, Tokyo)

aurora is very unpredictable. The thrill of the chase draws many VHF weak-signal DXers to work auroral DX.

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

The K index is a good indicator of the expansion of the auroral oval, and the possible intensity of the aurora. When the K index is higher than 5, most readers in the

northern states and in Canada can expect favorable aurora conditions. If the K index reaches 8 or 9, it is highly possible for radio aurora to be worked by stations as far south as California and Florida. Your magnetic latitude can be found using the map at <http://www.sec.noaa.gov/Aurora/globeNW.html>.

I have a wealth of links at <http://prop.hfradio.org/> that provide up-to-the-minute aurora information and data. One of the most useful resources is <http://aurora.n1bug.net/>, the "Aurora Sentry." Also, check out *CQ VHF* magazine for details regarding VHF propagation through the spring and summer.

Propagation Questions? I'd Like To Hear From You

You can join in with others in discussing space weather, propagation, and

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

Please don't hesitate to write and let me know about any interesting propagation you have noticed. Do you have questions about propagation? I look forward to hearing from you at either P.O. Box 213 Brinnon, WA 98320-0213, or via e-mail at pc-prop-man@hfradio.org. Happy signal hunting!

Correction

In the February column, on page 18, the captions for the two figures were swapped. The figure on the top left of the page shows the Ap levels during the storm of November 7-10, 2004, while the bottom right figure shows the Kp levels during the same time period.

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Uniden's BC246T Scanner

If your city has switched to analog trunking, the Uniden Bearcat BC246T is the smallest handheld portable scanner on the market. It exceeded our in-the-field evaluation, and even outdid itself when compared to the printed specifications. The trademarked word "TrunkTracking" is how Uniden describes its equipment, and the "246" is the lower-priced analog version in a family of scanners that includes TrunkTracking™ digital scanners, too.

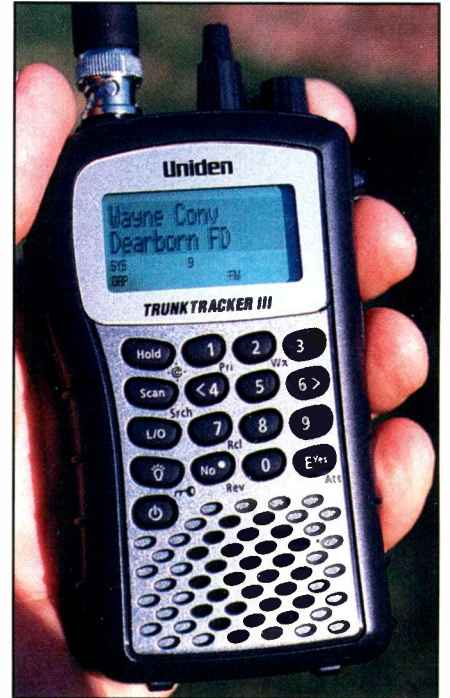
The BC246T covers selected VHF and UHF bands from 25 MHz to up 1,300 MHz, automatically selecting 5-kHz AM steps from 25 MHz to 28 MHz; 25-kHz AM steps on the aircraft band; and 5-kHz, 12.5-kHz, and 20-kHz steps (selectable) narrow-band FM on frequencies above 28 MHz.

For our southern California tests we programmed our county-wide fire radio system, Motorola Type II, Smart Zone, for analog trunking reception. We also preprogrammed several aeronautical AM channels, mixed in with narrow-band FM channels for next-county police and fire

departments, Red Cross operational frequencies, marine-band channel 16, and several private ambulance services. I was pleased to see that the analog trunk-tracking capabilities of this tiny scanner did not limit any conventional channels and groups of channels that I wished to store.

"Our new Uniden scanner BC246T is the perfect radio receiver for a scanner listener to grow into trunk tracking without the need to purchase another radio," comments Paul Opitz, Uniden's lead product developer, who has a long history of designing popular scanner equipment. "I love scanning, and the development of the 246T allowed me to become an architect to develop truly dynamic memory—allowing a scanner operator to program up to 2,500 channels into nearly any configuration desired, by channel groups of a system, *not* just ten banks like the traditional scanner," adds Opitz.

If you include alphanumeric for every channel readout, the capacity diminishes to around 1,500 channels, but 1,500 channels was plenty for us—with the alpha tags.



The 246T scanner is factory pre-programmed with some areas' trunked systems right out of the box.



The sturdy belt clip on Uniden's BC246T scanner resisted all attempts to pull it off!

Memory Assigned In A Pool

"Instead of memory channels that would need to go into separate banks, this particular scanner allows memory to be assigned in a pool," adds Opitz. "You can store as much memory as you need in the pool, including actual frequency, trunk talk group IDs, and alpha tags, showing that no memory space is wasted, and you can tell at a glance how much memory you have used and how much remains."

To assist in scanning *only* those conventional channels local to your area, the BC246T has a built-in CTCSS (continuous tone-coded squelch system) and DCS (digital-coded squelch) to keep out more distant stations when your local station is not actually transmitting with the specific tone you have memorized for decode. While CTCSS is relatively common, this scanner also includes DCS decode capabilities as well.

As the public safety bands become more crowded, the usual first step for a municipality is to switch from set fre-

quency assignments to trunking. Each trunk group is assigned a talk group ID. A computer controls the frequency on which each group operates, even after a single transmission, allowing multiple units to always find an open channel for transmissions among themselves and to their central dispatch. The BC246T will track the following trunk systems:

Motorola Type I, Type II, Type III hybrid

Motorola SMARTNET
Motorola PrivacyPlus
LTR trunk systems
EDACS Scat trunk systems
EDACS trunk systems

Trunking Help

This particular scanner is specifically *analog*. Uniden has other slightly larger scanners for decoding APCO (Association of Public Safety Communications Officials) digital systems. However, if your public safety group has adopted



Side-by-side comparison of even public safety radios revealed equal signal sensitivities!

encrypted digital trunking, there is no scanner, nor available computer program, that will crack the code.

How can you tell what system your municipality is using? You can look them up on the internet:

- <http://www.scannermaster.com>
- <http://www.radioreference.com>
- <http://www.bearcat.com>
- <http://www.groups.yahoo.com/group/BC246T>

Uniden Bearcat recognizes that trunked radio systems are dynamic, and occasionally a municipality may change talk groups. To assist first-time trunking radio operators, Uniden is shipping all BC246Ts with preprogrammed trunk systems for out-of-the-box reception for the following areas:

- Arizona: Maricopa County
- California: Seven different county systems
- Florida: Broward and Dade County systems
- Illinois: Cook County
- Massachusetts: Middlesex County
- Michigan: Wayne County
- Nevada: Clark County
- New York: New York and Suffolk County
- Pennsylvania: Philadelphia
- Texas: Four counties
- Washington: King County

Recent consumer-electronics statistics reveal that mail-order sales of portable electronics are at 75 percent, versus the 25 percent of scanners sold at storefronts. This was one reason why Bearcat decided to pre-load trunking groups, as opposed to the scanner enthusiast receiving the new product but having to spend hours searching for their popular frequencies. If you live in one of the above 11 areas of the country, your equipment plays straight out of the box on your local trunk system, along with alphanumeric on the BC246T that clearly indicate what you have tuned in. Deleting talk groups on the little Bearcat requires a single button push.

Here in southern California, our Motorola Type II talk groups, listed in 5-digit numbers, were over-active during the recent cluster of southern California water spouts that turned into tornados, one tornado ripping every piece of aluminum off my roof. It was a snap to temporarily delete talk groups for trunk-

ing reception, and to continuously monitor and add special groups by 5-digit talk-group IDs during the storm. I found good, solid trunking reception right alongside fire rescue personnel using multi-thousand-dollar pack sets into their trunking system. There were even times when the little 246T was hearing calls that some of the more expensive equipment was missing in the heavy rain!

The scanning rate on the trunking radio system was actually *faster* than some of the commercial radios worn by the fire personnel. With the Uniden 246T, I would hear one more syllable before the did! I could also pick up conventional Red Cross channels when scanning the fire-service trunked talk groups.

For the *advanced* trunking radio operator, the Uniden 246T has many system options: system editing quick key, instant system lockout, system hold times, channel delay times, talk-group ID scan/ search, Motorola fleet map editing, non-16 multiple Motorola status bit programming, Motorola and EDACS system emergency alert, system attenuation set, and entering/editing system group names.

While it is possible to accomplish all of the programming right on the keypad, the task is much more easily accomplished by working the scanner into a computer frequency program with the supplied computer connection cable. Uniden offers free advice on the best downloads at 800-297-1023. Better yet, find someone with the same equipment and perform the cloning steps outlined in the well-written instruction manual.

The BC246T also comes loaded with conventional scanning service groups: public safety, news, air, CB radio, railroad, marine VHF channels, ham radio channels, FRS/GMRS channels, and auto-racing channels.

"We have designed this scanner for both the beginning scanning enthusiast as well as the professional scanner listener," says Paul Opitz. "This allows the new user to slowly grow into all of the advanced scanning features in this trunk and conventional scanner receiver," adds Opitz, noting that in this scanner there are some unique features for conventional scanning that separate it from the competition. These are: subaudible tone search, automatic paging system tone skip, setting modulation types, limiting maximum automatic storing channels, and setting data skip.

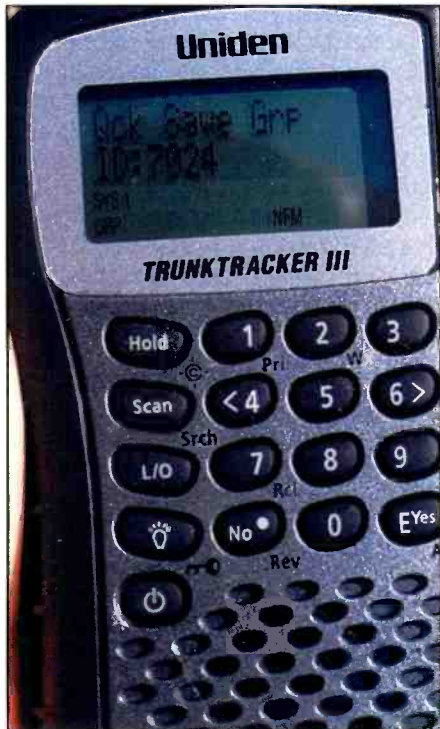
The Close Call® Feature

I also discovered a conventional scanning feature that I have never seen in a single scanner receiver; Uniden calls it "Close Call®." When you enter this mode, the scanner switches itself into a near-field scanning receiver with automatic loading of nearby detected signals. You can also enable this feature while *simultaneously* scanning regular conventional frequencies or scanning trunk ID groups. A small icon appears on the display when the Close Call® detection feature is enabled.

"This Close Call® RF capture technology is the first major scanning innovation that we have gotten excited about in a very long time," comments Opitz. "It is able to detect a strong nearby signal within one-tenth of a second and automatically store that signal in the Close Call® memory."

When the scanner detects a nearby signal, it will "beep" and display "CC Found—Press Any Key." I then press a key, and I'm now listening with full sensitivity on that specific frequency. When Close Call® near-field is turned on, the detection signal range is about 100 feet, depending on how much power the nearby transmitter is putting out. For a high-power mobile station, we detected it up to 300 feet away!

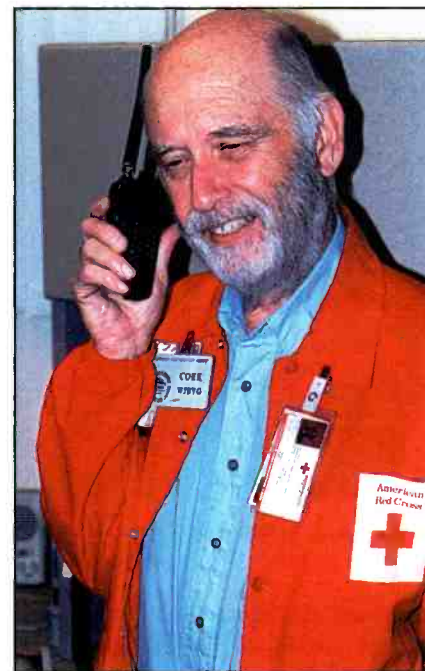
You can further refine the Close Call® feature by locking out any bands on which you might not want to capture signals. If



It was easy to "quick save" new talk groups discovered during our tests.



The supplied NiMH batteries lasted for six hours of continuous scanning.



Here's "Corky," W5BYG, a communicator with the Orange County American Red Cross, using the BC246T scanner.

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US TO MAKE A
CHOICE. WE CAN BE
AFRAID. OR
WE CAN BE READY.**

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you are working with fire personnel who are using conventional 460-MHz frequencies, you can leave only the UHF band turned on for Close Call® hits, and your near-field receiver will now pick up any calls within about a block of where you are standing!

If you want to continuously monitor *only* near-field signals, you can go into the Close Call® override mode, and you won't need to press any key at all to hear the radio traffic.

A Very Good Scanner!

Another hot feature I discovered before our southern California tornado was WEATHER ALERT. We don't get many weather events here in southern California, so it took me a few moments to figure out what was beeping, until I looked on the screen and saw the weather advisory. The large, orange LCD display clearly reads out the information, so you won't even need your granny glasses to check out what you have dialed in and what the display is showing. Of course, the display is backlit for easy viewing at night.

Best of all, the ultra-small size of this pocket scanner with trunking capabilities was a surprise to most Red Cross scanner enthusiasts who had no idea how small it was from just looking at the pic-

tures. When they got it into their hands, they were impressed!

Audio output was crisp and clear at full volume, easily heard when the scanner was worn on the belt. I also tested the battery life of the twin "AA" cells; with many calls being received, battery life was an incredible six hours. The unit ships with rechargeable NiMH (nickel metal hydride) "AA" cells and a wall charger, but you can use standard alkaline "AA" batteries.

Finally, if you're heavily into trunking reception with a scanner, you will have the BC246T programmed in no time. If you are brand new to receiving trunked signals and figuring out the right ID talk groups, get a pal to help you get things programmed, or take advantage of the preprogrammed talk groups that might already be stored for your area of operation. That's what I did, so there was hardly any trunk frequency that I needed to input to bring up the right ID group. Once your BC246T locks onto the correct talk group, you won't even know your scanner is working as hard as it is to track each and every syllable of the conversation!

For more information on the Uniden BC246T Scanner, contact Uniden Corporation at 800-554-3988, or visit them on the Web at www.uniden.com. Next month we'll take a look at programming the BC246T, so stay tuned! ■

Radio Fun And Going Back In Time

Q. Why do military operators use the word "Roger" so often in their transmissions?

A. Military tradition is a very strong thing. Roger used to be the phonetic equivalent of R as Romeo is now. In the old days of military telegraphy an R would be sent to indicate the message had been received. When phone became the most common method of transmission, the proper reception response became "Roger." Since many messages were considered orders, Roger came to mean "Yes Sir." Anything the military has been doing since the Civil War is likely to continue.

Q. What happens when governmental use of a frequency interferes with commercial use of the same frequency?

A. Back in the days before satellites and microwaves AT&T had shortwave sites for overseas telephone traffic. One of them was in Fort Lauderdale for traffic to Central American countries. In 1963 the company receiving AT&T's traffic was Compania Radiografica Costarricense in Costa Rica. CRC operated one of the most stable points that AT&T worked. Very few people asking for "the Miami Overseas operator" knew that their call to San Jose was sent over shortwave. One of the frequencies used by the AT&T-CRC connection was 15580 kHz. The frequency was designated TIW55 by the Costa Rican government and reserved by license to CRC.

Everything went fine until a Morse code transmission started showing up about 1 kHz inside the channel. The transmission showed up every afternoon for a couple of hours. The telephone circuit would have a very clear Morse transmission of "JW de IQ" repeated over and over. There was never a reply, and no other traffic. Then the signal disappeared until the next day. Naturally no telephone traffic could be sent over that channel until the interference disappeared.

AT&T got out all their engineering hardware and direction finders. They told their Costa Rican colleagues the interference was coming from near San Jose. The folks at CRC seemed to know more about the problem than the AT&T engineers. The Costa Ricans said they would look into the matter. Nothing changed, however.

Finally the AT&T engineers sent someone to the local FCC monitoring station. After hearing the frequency and callsigns involved the FCC duty officer said "Oh them. Are you sure you want to make a complaint?" When asked why not the FCC replied "Oh, nothing, I guess. But maybe you don't really want to make a complaint."

AT&T did want to complain. Things went on as usual for two days and the channel was used except for the period of interference every afternoon. On the third day the AT&T requested the CRC to change to the TIW 55 channel in the morning. Their Costa Rican counterpart said "We can't do that. Our license to operate on TIW 55 was cancelled by our government yesterday." In about 48 hours Ma Bell had found out who was really running things, and it wasn't AT&T.

Q. Has anybody ever worked the ham bands from a submarine while submerged at sea?

A. In the '60's aboard the USS Cutlass, Dan Reilly, W4NMK worked 15, 20 and 40 meters, mostly on single sideband. His antenna was a 12-foot base-loaded whip and he used the submarine's regular communications gear. When submerged to

communications depth - 60 feet (depth of the keel) - the antenna was still above the water. Dan was surprised to find a 40db increase in signal strength when submerged. Great ground plane effect! On a six-week cruise he made 625 contacts in 42 states and 28 countries. How did he get away with it? He was Commander Dan Reilly, the sub's skipper.

Q. What were the requirements for an Amateur Radio License in the early days of radio?

A. In the 1920 "Wireless Experimenter's Manual" the requirements were sending and receiving code at 10 words-per-minute. Most stations were homebrew so an interview test was given which required you to draw the circuitry of your station and explain it and the rules of operation and international conventions. This all usually took a couple of hours. Tests were only given in nine cities in the country. Passing would get you a first class operator's license. There were roving Examiners who would visit an area which had a lot of requests for licenses. His exam was the same, but included a station inspection. A second class operator's license could be obtained by filing a form with the Commerce Department, but was only good until an Examiner visited your area. Licenses to operate a Land Station were separate, and applications listed the type and characteristics of the station. To operate your own station you needed both licenses.

Looking Back...

Five Years Ago in Pop'Comm

Optoelectronics, Inc. was advertising their new Xplorer nearfield test receiver that sold for \$799. And ICOM was advertising their new IC-R75 HF receiver; it featured a triple conversion receive system and covered 0.03 to 60 MHz. And while we're talking about "new" products back in 2000!, Grundig's entry was the Satellit 800, billed as "the ultimate in digital technology." Our Product Spotlight was on the AR-5000 Plus 3 that included computer control through an RS-232 port.

Ten Years Ago in Pop'Comm

One of our features in April 1995 was titled, "Who Else Is Listening?" Its focus was on how the military viewed civilian monitoring of the airwaves. Hobbyists were called "amateur sleuths" by writer Lt.Col. Constantine Papas, but he also pointed out the sheer vastness of the spectrum offers some excellent, exciting monitoring! In our "Telephones Enroute" column, Mitsubishi's new Acces AH-2000 portable cell phone was announced as offering "... 1.5 hours of talk time, which is nearly 50 percent more than many other units." MSRP for the unit was \$249!

Twenty Years Ago in Pop'Comm

A single phrase in an article by Gerry Dexter in the April 1985 Pop'Comm really stands out today, as he spoke of monitoring the "Eastern Bloc" - "... like wallpaper, time is taking its toll." Sure enough, time did take its toll, and the walls came tumbling down! FCC news in April 1985 revolved around the radio spectrum and the FCC's proposal of additional spectrum in the 896-902 and 935-941 MHz bands for Private Land Mobile Use. And the Regency D310, a 30-channel programmable scanner, was advertised at \$129.99.

Hunting With Midland's GXT-400 X-Tra Talk™ GMRS Radios

Slowly I glassed the tree line directly ahead of me. My 50-percent yellow-tinted shooting glasses coupled with my Nikon 7X35 binoculars offered me an enhanced look into the darkened forest, allowing me to penetrate farther into the dim interior. He was out there somewhere, watching me watch him. I could feel it. His camouflage was good, very good, further enhancing his stealth abilities. Unfortunately, I didn't have any thermal imagery, not that it would have done me any good, since his IR signature was extremely low in the first place. Damn! Where was he? Slowly I moved the binoculars across the front of the tree line, straining to catch a glimpse of movement, an exhalation of breath, anything that would mark my target's position.

Suddenly there was a burst of noise in my left ear—three quick keys of the mic, followed in rapid succession by three more, the prearranged signal for something moving along the trail. My partner, Ray Kenney, was positioned approximately 20 yards to my right and had a much better look at the single-file trail that was barely discernable to all but the trained eye. Ray had spotted something moving and was letting me know that things were about to heat up very quickly.

I brought the rifle up to my shoulder, quietly swung the muzzle to my left, while my right thumb snicked the tang safety to the "fire" position, anticipating that my target momentarily would be in sight. The Leupold 3-9 variable scope revealed nothing out of the ordinary. For a second I thought that Ray might have been having hallucinations.

Without warning, three of them broke cover and ran up the trail directly towards Ray's position. I acquired the second target and started swinging the muzzle while keeping the crosshairs of the scope aligned slightly ahead of his shoulder. At this range, around 15 yards, it would be an easy shot. At the precise moment that I started squeezing the Acu-trigger™ on my Savage Model 116, I saw the flash of fluorescent orange of Ray's jacket in my peripheral vision. I had been swinging from left to right, and Ray stood up just a split second before I completed my trigger squeeze!

I immediately jerked the muzzle of my rifle skyward and safed the rifle, lest we have an "incident." Ray continued tracking the three targets and managed one shot at the fleeting white-tail buck just as it cleared the edge of the small rise to our right.

Total time from Ray's signal in my earpiece to the shot: 5 seconds, tops. I keyed my Midland GXT-400 X-Tra Talk™ GMRS radio and said, "Did you have a clean shot, Ray?"

"Yeah, but I failed to lead him enough and went right over his back, I think," replied my hunting partner. "I'll go take a look for blood spoor just to make certain, but I don't think I connected at all with that shot, Rich," Ray added as he turned to his right and slowly began moving down the deer trail, cautiously watching for blood sign.

This past year, in December 2004, was the first year I'd been out hunting white-tail deer in over five years. In August I had undergone a critical surgical procedure and one of my goals upon recovery, actually the goal at the top of my list, was to get

out into the woods again and enjoy some hunting, fishing, and camping. It was good to fulfill one of my goals. It meant I was on the mend.

I'm a card-carrying member of the NRA, an avid hunter, and a pistol/rifle shooter. I enjoy owning guns, shooting guns, and talking about guns. About the only thing I don't like about guns is cleaning them! My wife, The Beautiful and Talented Patricia, is like-minded, which is one of the reasons why I love her to death. She is an accomplished pistol and rifle shot, enjoys hunting and fishing, and has just taken up skeet shooting. If the truth be told, she can out shoot me by a wide margin. Women are just better at some things, and she happens to be a damned good pistol shot.

Staying In Touch With Midland

Back to the Midland GXT-400 X-Tra Talk™ GMRS radios. Thanks to the generosity of Chris Oehlert, the Marketing & Communications Manager at Midland Radio, I procured a set of the newest 4-watt Midland X-Tra Talk™ offerings along with a pair of Midland's GXT-300 three-watt units, complete with integrated earpiece/bomb microphone for hands-free operation. This was for testing and evaluation in an emergency communications (EmComm) scenario earlier in the year. I had displayed these new radios at the First Annual Emergency Communications Conference in Selinsgrove, PA in October, where they received some very positive comments from the emergency communicators in attendance. Then the idea hit me to take these radios hunting. What better field trial than slogging about the bush in less-than-ideal weather conditions?

Ray and I had been using our GXT-400s for the entire day, keeping traffic to a minimum, but knowing all the while that with *four watts* (yes, you read that correctly—4 watts) RF output, we had instantaneous, rock-solid communications up to 3 to 5 miles. The GXT-400 X-Tra Talk™ rigs are the first GMRS radios I know of that offer a substantial increased power output, which is not a bad idea, provided the battery budget will handle this enhanced capability. These small, palm-size UHF transceivers use four "AA" alkaline cells and seem to last forever! Patricia and I had used them extensively the previous day



Midland's GXT-400 X-Tra Talk™ GMRS handheld radios are \$79.95 a pair and offer a lot of outstanding features!

on the first day of deer season in Pennsylvania.

The GXT-400's Features

The earpiece/mic arrangement with the PTT switch on the cable that runs to the radio is the perfect way to keep conversations private, and is the answer to having immediate short-range UHF communications available at a relatively inexpensive price. As with the majority of GMRS handheld transceivers currently on the market, the GXT-400 and 300 models offer 22 channels, 8 of which overlap with the Family Radio Service (FRS) frequencies. There is an automatic power-output limitation imposed when you switch to these FRS frequencies, limiting your output to only 500 milliwatts. There are 38 separate CTCSS privacy tones available for programming. This will yield a relatively interference-free channel for your use, provided no one else in your immediate area has a set of these radios on the same channel with the same set of programmed CTCSS tones.

As stated earlier, the battery life of these tiny rigs is amazing. Even with Patricia and I using them extensively the first day, I did not replace the batteries for the second day when I hit the bush with Ray, where we used them for over 12 hours. Now that is what I call a great battery budget!

Although Midland advertises a 10-mile range with these little UHF rigs, that is, in my humble opinion, extremely optimistic. I would guess that you might make 10 miles between GXT-400s if you were on a lake or between mountaintops. However, in the city, in suburban areas, or in dense woods with undulating topography (like where we were hunting), my educated guess is that you'd get about 3 to 5 miles maximum range even with these higher powered units. The reason, of course, is due to the short antenna and the UHF frequencies employed. If Midland were to offer an external antenna jack or possibly an optional gain antenna for use on these rigs, the useful range would be boosted dramatically. However, because they also operate on the unlicensed, lower power FRS frequencies, a detachable antenna is not permitted.

Easy To Use!

Ergonomically, these two newest releases from Midland are very intuitive radios to use. They are menu driven, but

once you learn how to read the LCD display, it is a simple matter to program the channels, CTCSS tones, VOX, etc. The power output is selectable between three separate power levels. This is great news, especially when you are using the radios in close proximity and don't need the full 3 or 4 watts rated output. Reducing the output power definitely prolongs battery life.

There is a CALL button on the front that puts out a selective call tone to the companion radio; there are five separate call tones which are user programmable. The GXT-400 and 300 X-Tra Talk™ models also feature a standard on/off/power switch incorporated into the volume control. By pushing MON/SCAN button once, it throws the receiver into a scan mode whereby all 22 channels are sequentially scanned, stopping on an active channel. By pushing and holding the MON/SCAN button, the squelch is defeated and you can listen to weak signals on the channel that are not strong enough to overcome the squelch threshold. A stout belt clip rounds out the basic radio package and is robust enough to securely hold the GXT-400 or 300 handheld in the most demanding situations.

Long-time readers of this column know my feelings about nickel-cadmium (NiCad) batteries: I don't like them *at all!* This is based upon years of frustration with NiCad packs that fail after recharging and never seem to have a charge when you need them. Long ago I standardized on "AA" alkaline batteries in my radios in place of NiCad packs. To that end, the Midland GXT-400 and 300 X-Tra Talk™ series of GMRS radios thrive on standard "AA" alkalines. The use we got from the GXT-400 X-Tra Talk™ radios during four days of hunting was seriously amazing. Obviously, Midland got it right when it came to designing a handheld GRMS walkie-talkie with decent current demands.

Lately, however, I have been investigating the Lithium Ion "AA" cells sold at Wal-Mart and other retail stores. This came about from my experimentation with the Elecraft KX-1 transceiver kit (more on this rig later). Elecraft advised the builders/users of the KX-1 that the Lithium Ion "AA" cells would outlast standard "AA" alkalines by several times while cutting the overall weight of the battery pack in half! Now for someone who is interested in hiking, camping, or taking a rig out on a trail or into the bush, saving weight is paramount! Although extremely expensive, these Lithium Ion

"AA" cells seem to last forever. They have an exceptionally long, useful discharge cycle that, when compared to NiCad packs or standard "AA" alkalines, leaves no doubt in one's mind which battery to include for an outing. Currently I am using these Lithium Ion "AA" cells in both sets of Midland GXT-400s and GXT-300s. More on this in an upcoming column on portable power.

For more information on the outstanding Midland GXT-400 X-Tra Talk™ handheld radios, which cost \$79.95 per pair, contact Midland Radio Corporation at 1120 Clay St., North Kansas City, MO 64116 USA; phone 816-241-8500 or fax 816-241-5713. You can also e-mail them at mail@midlandradio.com or visit them on the Web at www.midlandradio.com. Be sure to mention *Popular Communications!*

Midland Radios In "The Sandbox"

By the time you read this, my good friend, fellow traveling man, and all-around "good guy" Jack Rose (a.k.a. SFC Jack Rose, 1st Squad, 2nd Platoon, Alfa Company, 1st Battalion, 109th Infantry Regiment, Mechanized) will be serving in "The Sandbox" (a.k.a. Iraq). Jack and his associates are being activated and shipped to Iraq in support of our on-going War on Terror.

Having a long association with the US military, I asked Jack if there was anything he needed that I might be able to provide prior to his departure. At first he hesitated, and then he wanted to know if I had any FRS or GMRS handheld radios he might take with him. It seems that GMRS/FRS radios are quite popular in "The Sandbox," with our troops needing immediate, low-power, close-quarters, tactical communications.

I contacted Chris to see if there was any way I could finagle a couple of GXTs from him for Jack and his buddies. Chris, being a Good American and all for testing these rigs out in the most inhospitable conditions imaginable, quickly agreed to send me four of the 4-watt GXT-400 X-Tra Talk™ handhelds with headset/microphone options. I made sure that Chris understood that should these radios manage to survive and return home with Jack and the boys, they probably would be pretty "well used." That didn't seem to be a problem for Chris!

I will stay in contact with Jack and his buddies via e-mail during their 12 months in "The Sandbox" and relate some of their

efforts to bring peace and tranquility and establish a democratically elected government in this war-torn area of the Middle East. Of particular interest to both Chris and me will be Jack's on-going evaluation of the GXT-400 X-Tra Talk™ radios. Hmm . . . I wonder if Midland will put "Combat Tested" on future packaging of these radios?

Special thanks to Chris and the entire crew at Midland Radio for providing these radios to SFC Rose and the guys of the 109th as they go off to Iraq.

The Elecraft Solution

Earlier I mentioned the Elecraft KX-1 transceiver. Let me tell you a little about this extremely impressive package

Elecraft is a relatively new communications company that came on the scene about 1997. Two talented electronic engineers, Wayne Burdick, N6KR and Eric Swartz, WA6HHQ, got together and formed Elecraft. They designed and marketed the K2, which has become the best QRP transceiver ever to hit the ham radio market. The K2 is unique because it is a kit! That's right, you build it yourself. It is *not* a typical Heathkit-type kit—far from it. In actuality, it is far better than anything Heathkit ever marketed. The instructions are extremely well done and quite concise and clear. The parts are top-notch, and the result is a kit that will go together easily, even when built by a relatively inexperienced builder. It also will work the first time.

The barebones K2 kit is a CW-only radio. Options include an SSB module, an internal automatic antenna tuner, an internal battery supply, noise blanker, and optional DSP unit that has to be experienced to be believed.

The ARRL lab did a work up on the K2 back in 2002, and rated it at or beyond anything that had come from any of the Offshore Empire's factories. The receiver specifications are on par with imported rigs costing over \$3000! With the new DSP unit installed, the receiver outperforms anything on the market! Prices for the barebones K2 kit start at \$599.

You get the picture: Elecraft has its stuff together, to say the least. About a year after the K2 they released the K1, a much smaller, more portable CW-only transceiver kit. Last year Wayne and Eric cut loose and hit the market with what I feel is the ultimate backpacking/portable/emergency communications radio, the KX-1. This tiny (about the size of a 3" x 5" file card,

only 1.3 inch thick) CW-only rig is really neat. It comes in a two-band model (40 and 20 meters), but can be expanded to include 30 meters with an optional module. The 30-meter module also increases the SW frequencies that can be heard on this little rig. Not only can you play on the ham bands, but you can DX the SW bands, too! It takes six "AA" cells or any external power up to 15 volts. The internal CPU samples the voltage sources and takes the highest one to work from. Now that is really cool!

The KX-1 also features an internal automatic antenna tuner as an optional accessory. Rounding out the accessory list is a nifty little paddle set that plugs into the front of the rig and allows either right- or left-hand CW operation. The total for the KX-1 kit and all the options is around \$400! The receiver is hot, hot, *HOT!* It has a four-crystal IF and a built-in memory keyer (5–50 WPM), too! SW reception is provided for 60, 49, 31, and 19 meters. You can also receive WWV on 5, 10, and 15 MHz. The internal automatic antenna tuner will match end-fed wires with counterpoise, standard dipole antennas, or, with the use of an external 4:1 balun, antennas that use open-wire or twin-lead feedlines.

The really unique thing about the KX-1 is that it is what is called a "Trail Friendly Radio," or "TFR." This means that it has been optimized for use in camping, backpacking, hiking, etc. The controls are all on the top of the radio, facing upwards toward the operator, not on the side of the box like the regular radio we are all use to. This makes it easy to operate the KX-1 from a small table, log, etc., while kneeling, standing, or sitting. Team Elecraft even included a very-high-intensity white LED for use as a logging light and/or emergency flashlight.

As I stated before, the Elecraft design team suggests using Lithium Ion "AA" cells, and I whole heartedly agree. Although a lot more expensive than the standard "AA" alkaline cells, these Lithium Ion cells are half the weight of alkalines and offer a much longer and steadier discharge cycle—all nice things to have when operating from the bush.

Many of you have probably concluded that I have "flipped out" in suggesting that emergency communications be attempted using a CW-only transceiver. Far from it. For tactical comms FM voice is the sure-fire winner. However, when it comes to long-haul, point-to-point comms, there is nothing wrong with using whatever mode will get the job done. For those of you who think CW is a thing of the past, let me reassure you that all branches of the service have reinstated CW training for radio operators. Why? Because CW is readable during degraded band conditions when SSB or FM is totally unsuited to getting the message through. Therefore, I think that the KX-1 should deserve special consideration for the emergency communicator. With its small size, 4 watts output (using 12 volts DC), and the ability to work into almost any type of antenna, the KX-1 is a good choice for a "doomsday" rig. When all else fails, keep in mind that CW can get through!

For more information and detailed specifications on the KX-1 transceiver, check out Elecraft's website at www.elecraft.com.

In Closing . . .

Well, that's a wrap for this month. I have been working on a story about the local ATV club and their involvement with the Luzerne County Emergency Management Agency as a Search and Rescue (SAR) unit. If all goes as planned, this will be the focus of next month's "Homeland Security" column. In the meantime, train hard and remember: Preparedness is not optional. ■



The Elecraft KX-1 portable CW transceiver is ideal for the emergency communicator. Remember: CW gets through when other modes can't!

**Popular
Communications
April 2005 Survey
Questions**

I've recently purchased a new scanner and programmed it successfully.
 Yes.....1
 No.....2

I prefer my older scanner because it isn't complicated to program and serves all my needs
 Yes.....1
 No.....2

My new scanner is a:
 Handheld5
 Base/mobile.....6
 Haven't purchased a new scanner recently.....7

The software that came with my scanner helped me:
 A lot.....8
 Not at all.....9
 Didn't come with software.....10

I tried programming my scanner with software:
 That came with the radio.....11
 From another company.....12
 That my computer failed to recognize.....13
 That didn't have the frequencies for my area-especially trunked frequencies..14

I have a new scanner with trunking capability but I haven't programmed it because:
 I can't find reliable information such as talk groups and IDs15
 There's so much involved in the process 16
 I don't understand trunking and the manual was inadequate17
 There are no trunked systems in my area .18

I belong to a radio club that either sells or has free scanner programming software for members.
 Yes.....19
 No.....20

I would buy software programming if it included a nationwide frequency database.
 Yes.....21
 No.....22
 Not sure23

I think scanner manufacturers should include a free online programming service with every computer capable scanner.
 Yes.....24
 No.....25
 Not sure26

V.I.P. SPOTLIGHT

**Our April Winner:
Congratulations To
Mark Emanuele of New Jersey!**

Pop'Comm reader Mark Emanuele says "About 35 years ago, my friend, Randy Becker, a fellow Boy Scout in Fords, NJ realized I was interested in electronics when I went for the radio and electronics merit badges and built a RadioShack shortwave kit. He invited me to a meeting one Saturday afternoon at the Metuchen, NJ YMCA Amateur Radio club.

Randy greeted me and my dad at the Y, along with a friend of his from high school, Mike Nicolich (Then WA2JZW now N2JZ). Mike then introduced me to George Russel (SK W2SJU), the Adult Advisor of the club, who brought me into a room with all kinds of "neat stuff." There were racks upon racks of vacuum tubes lit up and a TV monitor that had a black & white test pattern on it with the call-sign K2YNT-TV. Well at that point, I WAS HOOKED. WOW not only radio, but TV!

The guys at the club helped me get my Novice License (WN2UQO). Over the years I eventually got my General class and my current call-sign N2CBO. In college, I got involved in the campus radio station, WNSC (Now WKNJ), and eventually became the "Morning Drive" guy on the station. My college major was Music, with a minor in Computer Science. After realizing that I was not going to make a decent living performing music, and that the computer stuff I learned was completely out of date, I bought a Heathkit H-8 and taught myself all about micro-computers, as they were called at the time. I started working in the field, eventually learning networking and data communications, and even starting my own consulting company.

In 1992, after a fellow ham, Dave Marthouse (N2AAM) invited me on his local AM talk program, we got together along with Stan Olochwoszcz (N2AYJ) and started our own weekend talk show about radio and tech-



Pop'Comm reader Mark Emanuele of New Jersey is the MARS Emergency Operations Officer for Central New Jersey.

nology called Spectrum on Shortwave Lightning Bolt WWCR in Nashville, TN. That's where most of you probably heard of me. When the "Let's Talk Radio Network" (our syndicators) folded, I started the Omega Radio Network to syndicate the show as well as many others. After losing our Chief Engineer, Rod Coppola (KA2KET) in the World Trade Center attack on 9/11/2001, I joined the US Army MARS, where I am the Emergency Operations Officer for Central NJ, and operate mostly HF SSB, but also use a lot of the HF digital modes such as MT-63, MFSK-16, Pactor, and Amtor. I am on the test team in New Jersey for MARS-ALE (Automatic Link Establishment).

In 2003, after an 11-year run, unfortunately I had to cancel the Spectrum Show due to health issues, but The Omega Network still lives on as one of the top 20 Internet broadcasters running a Classic Rock music format at <http://www.orn.com>. I can be reached at mae@orn.com.

Popular Communications invites you to submit, in about 300 words, how you got started in the communications hobby. Entries should be typewritten, or otherwise easily readable. If possible, your photo should be included.

Each month, we'll select one entry and publish it here. All submissions become the property of *Popular Communications*, and none will be acknowledged or returned. Entries will be selected taking into consideration the story they relate, and if it is especially interesting, unusual or even humorous. We reserve the right to edit all submitted material for length, grammar, and style.

The person whose entry is selected will receive a one-year gift subscription (or one-year subscription extension) to *Popular Communications*. Address all entries to: "V.I.P. Spotlight," *Popular Communications*, 25 Newbridge Road, Hicksville, NY 11801 or e-mail your entry to popularcom@aol.com.

The Bottom Line: Cost Estimates For Getting Into The Best Hobby In The World!

Ever perused the equipment ads in old ham radio magazines from the '40s through the '60s? Those attractive old Collins radios, for example, sold for a pretty penny, especially in the currency of the day! A premium receiver might have set you back \$1,500, and you could add a *transmitter* for about the same! Man, you could buy a nice new car (and a fishing boat) for less! It's no wonder most hams built their own gear or scavenged military surplus stuff. Ham radio was, in a certain sense, a "rich man's hobby."

Today, however, that's hardly the case. Ham gear, much like its computer counterpart, is priced at an historical low. In stock market terms, it's the crash that spawned the Great Depression! You can get good used gear for a song, and top-notch new gear for not much more. And, with respect to Collins collectors everywhere, today's gear performs twice as well, at a tenth of the cost (inflation figured in there somewhere!).

To help newcomers figure expenses, this month's column takes a look at several popular ham activities and offers realistic cost estimates for getting set up in each. These are "from scratch" estimates and averages. As always, your mileage may vary. If you shop and scrounge carefully you can probably beat these prices by a healthy margin. If your cash reserves are more plentiful, you can easily spend a bit more to buy top-of-the-line gear.

Figures Cover New Gear Only

If you really want to save cash, look for good used equipment, which can save you as much as 70 percent up front. The art of buying used ham gear is another topic entirely. If you're a newcomer, make sure you have help from experienced buyers.

Some items in the equipment lists show up more than once (a ham transceiver is the ultimate multipurpose device!). Some items, though, aren't mentioned at all (feedlines, miscellaneous hardware, and so on); these items certainly affect the total price, but they're too numerous to consider here.

Here we go. Cut your credit cards in half and give your checkbook to your spouse for safekeeping!

SSB/CW On The HF Bands

A typical entry-level multimode HF transceiver will set you back about \$700. Additional items may include a triband beam antenna (\$450), a multiband dipole antenna (\$65), a high-performance vertical antenna (\$350), a modest 50-foot tower and rotator (\$1,500), and an antenna tuner (\$175).



Running out of serial ports on your shack PC? Need a truly stealthy digital-mode audio interface? Then the latest gadget from Saratoga Amateur Radio Products, the EZ-PSK USB, should be on your short list. The compact interface works with just about every radio on the market, requires no external DC power, handles audio and PTT switching, and features dual audio isolation. It's so small, your biggest challenge may simply be finding it when you need it! Check it out at www.saratogaham.com.

If you demand tower-mounted, high-performance antennas, you can easily sink a large wad of money into a beam, tower, and rotator. If you don't mind the performance trade-off, an antenna tuner and a dipole will serve you nicely—and save you about \$2,000. Another alternative is to try low-power (QRP) operating. QRP transceivers typically cost \$200 to \$600, and power supply requirements are minimal. Most QRP rigs, however, are CW only, and only a few have multiband capability (my personal favorite is the Elecraft K2, which will cost you about \$600 in kit form).

2-Meter FM: Mobile Or Handheld

A new mobile FM transceiver will set you back about \$175, while a decent handheld rig can be purchased for about \$140. Two- or three-band radios cost about twice as much in each category. Mobile and base station antennas weigh in at about \$30 to \$75 each.

You can cut some corners on antennas here, too. If you're willing to settle for a basic, quarter-wave ground-plane antenna at home, you can buy one for about \$20. A quarter-wave mobile antenna with a magnetic base can be yours for only \$25.

HTs (handheld transceivers) are less expensive than mobile radios. Both types have advantages and disadvantages. HTs are convenient and versatile, but they lack the power for reliable, wide-area coverage. Even with a base antenna at home, you may

need an amplifier to extend your range, particularly on simplex. Mobile rigs lack portable convenience, but they have plenty of power and are usually loaded with additional features.

RTTY/PSK31/Digital Modes On The HF Bands

These days, most digital-mode operation on the HF bands relies on an audio interface (\$50 to \$100) and a computer equipped with a standard sound card (\$400 to \$1,000). If you're old-school you might use a multimode communications processor (MCP) or a dedicated RTTY terminal (\$300), which act as the middleman between your transceiver and the computer, translating shifting audio tones into manageable data.

SSB And CW On 6 And 2 Meters

Nowadays, your new "HF" transceiver may include 6- and 2-meter coverage, but if not, a 6- or 2-meter transceiver will run about \$600, with beam antennas costing about \$150 each. A 150-watt monoband amplifier (\$250), and whatever tower/rotator combo you decide on, may add to the initial expense.

Serious SSB/CW work on these bands really demands a beam antenna, and here the larger the better. A rotator is also necessary, but a tower is optional. Many weak-signal ops do just fine with roof-mounted arrays. Others take their gear on the road, working contests and activity weekends from hilltops or even skyscrapers.

Smart Shopping

Although the gear is more affordable than ever, you can further soften the impact on your bank account by using the following tips:

- Don't be an impulse shopper. You may drool at the first sight of a beautiful piece of equipment, but don't make a hasty decision. Take the time to check with several dealers and find the lowest price. Look in the mail-order catalogs and on the Web, too. With a little patience, you may save a substantial amount of money.

- Shop at hamfests. Amateur radio equipment dealers attend many of the larger hamfests, and they often offer spe-

cial prices on new equipment. If you're in the market for computer hardware, check out the computer shows that pop up from time to time. You'll find some tremendous bargains there.

- Sell your current equipment. There is always a market for good used gear. By selling off some of your older equipment, you can accumulate enough money to take the sting out of a new purchase.

- Don't buy more than you need. When you're evaluating equipment, beware of the "bells-and-whistles" syndrome. It's easy to be captivated by a 2-meter FM radio that includes every feature known to mankind. But think for a moment. Do you need dozens of programmable memories? Do you need paging capability? Do you need to receive out-of-band signals? If the answer is "no," look for a less expensive, less feature-packed radio.

Let's Hear From You

As always, send your QSL cards, photos, and letters to me at *Popular Communications*, "Ham Discoveries," 25 Newbridge Rd., Hicksville, NY 11801. See you in the bargain aisle! ■

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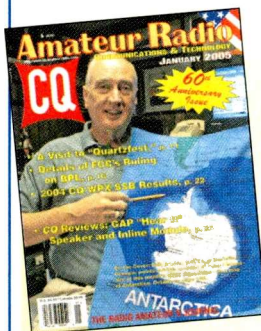
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Pop 'Comm Survey Results

Wanted: Your Help In Shaping Your Magazine's Future!

by Harold Ort, N2RLL, Editor

It's been a while since we last reported survey results, so let's get right down to business. First, though, a tip of the hat to our randomly-drawn winner of a free one-year subscription to *Popular Communications*, Michael Dryer of Grand Rapids, Michigan. Congratulations, Michael!

Solar Power

A few years back we ran an article on solar power and how you could operate a lot of your radio equipment from battery power using the sun's free energy. The response to that article was outstanding. Since then we've discussed various aspects of solar power that won't break your bank or make you crazy with special hookups. It's really not very complicated, as we'll discuss in another article very soon!

We also asked you a series of questions about solar power and your views on the subject. That month we received 100 responses, and 75 percent of you reported not using solar or other alternative energy to power your radio equipment. Not everyone answered that first question, so while at first glance you might think the remaining 25 percent of respondents do use solar or other alternative energy in their shacks, the figure turns out to be much lower—about 15 percent.

This is not to say you wouldn't use solar power if it were less expensive or you knew more about it, which is, of course, where we come in! About 45 percent of respondents said they would use it if it were indeed less expensive, and about the same number said they would use it if it were more readily available locally. About 30 percent want more information on the subject, and nearly the same number said they would use it if they had room for the panels and storage batteries; both are valid concerns, but as you'll see in an upcoming article, a small battery and panel can produce amazing results, if

only used for a couple of wall-mounted LED-type lights.

Very few of you are planning to go totally solar; about 1 percent reported that their entire home was off the power grid and the same number said they were planning on it someday.

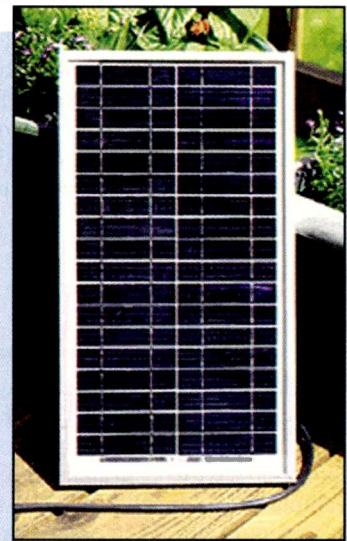
Portable Power!

OK, so you might not use solar or wind power, but perhaps you're using one or more of those portable power packs sold in automotive outlets or department stores. About 55 percent of those who responded said they use such portable power, while another 47 percent said they don't. Most of those who reported not using portable power said it was because it was too expensive—which is interesting, because while we'll spend big bucks on radios and accessories, many portable power units can be purchased for well under \$100.

Only about five percent of respondents said they don't have portable power because they don't have room to charge and store the unit, while about four percent reported not needing it. Think long and hard about not needing it, please. It's like flashlights and extra batteries or a smoke alarm—there as protection, and always ready!

What about running small lamps or older radios that operate on 110 Vac when the lights go out? You'd need an inverter, of course. So we asked if your portable power equipment includes an AC inverter. About 40 percent said yes, while another 52 percent said no.

If there's a power failure, what do you do? We asked if you own and use a portable, gas-operated generator. About 20 percent of those who responded said they do, while most folks—about 48 percent—said they don't. A very small percentage (three percent) reported using a generator, depending on how long the outage lasts.



Here's a small 10-watt solar panel from C. Crane Company that weighs under four pounds

However, when it gets right down to it, it's all about how many of us are scrambling in the dark for batteries or battery packs when the power goes out. Let's face it: Radio enthusiasts need to know what's going on. What's the real story behind the power outage itself?

With that in mind, we asked you about your radio's rechargeable batteries. Are they charged and ready to go so you don't have to scramble for alkalines in an emergency? About 45 percent of respondents said they are ready to go with charged batteries. About 38 percent said they weren't ready on a moment's notice. Three respondents hit the nail on the head, saying they weren't sure!

Remember, we need your survey cards returned so we can tweak your magazine and bring you the absolute best and most accurate information, so send in your card today. You might also win that free one-year subscription to *Pop'Comm*! ■

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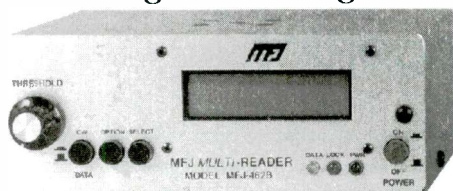
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Listen to maritime users, diplomats and amateurs send and receive error-free messages using various forms of TOR (Telex-Over-Radio).

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



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.
Use 12 VDC or use 110 VAC with MFJ-1312B AC adapter, \$12.95. 5 1/4"Wx2 1/4"Hx5 1/4"D inches.

-- all over the world -- Australia, Russia, Japan, etc. **MFJ-462B**
Printer Monitors **\$179.95**
24 Hours a Day

MFJ's exclusive TelePrinterPort™ lets you monitor any station 24 hours a day by printing transmissions on an Epson compatible printer. Printer cable, MFJ-5412, \$9.95.

MFJ MessageSaver™

You can save several pages of text in an 8K of memory for re-reading or later review.

High Performance Modem

MFJ's high performance PhaseLockLoop™ modem consistently gives you solid copy -- even with weak signals buried in noise. New threshold control minimizes noise interference --

greatly improves copy on CW and other modes.

Easy to use, tune and read

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

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

It's easy to read -- 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.

Use 12 VDC or use 110 VAC with MFJ-1312B AC adapter, \$12.95. 5 1/4"Wx2 1/4"Hx5 1/4"D inches.

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

Try it for 30 Days

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

Super Active Antenna

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

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

Switch two receivers and auxiliary or active antenna. 6x3x5 in. Remote has 54" whip, 50 feet

coax. 3x2x4 inches. 12 VDC or 110 VAC with MFJ-1312, \$12.95.

Indoor Active Antenna

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

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

Compact Active Antenna

Plug this compact MFJ all band active antenna into your receiver and you'll hear strong, clear signals from all over the world, 300 KHz to 200 MHz including low, medium, shortwave and VHF bands. Detachable 20" telescoping antenna. 9V battery or 110 VAC MFJ-1312B, \$12.95. 3 1/4"Wx1 1/4"Hx4 in.

Eliminate power line noise!



MFJ-1026
\$179.95

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

MFJ Antenna Matcher

Matches your antenna to your receiver so you get maximum signal and minimum loss. MFJ-959C Preamp with gain \$99.95

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

High-Gain Preselector

High-gain, high-Q receiver 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, \$12.95.

Dual Tunable Audio Filter

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

MFJ Shortwave Headphones



MFJ-392B
\$19.95
New!

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

High-Q Passive Preselector

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

Super Passive Preselector

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

MFJ Shortwave Speaker

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

MFJ-281
\$12.95

MFJ All Band Doublet

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



MFJ-1777
\$49.95
Ship Code A

MFJ Antenna Switches

MFJ-1704 \$69.95 MFJ-1702C \$24.95

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

Morse Code Reader

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

MFJ 24/12 Hour Station Clock

MFJ-108B, \$19.95. Dual 24/12 hour clock. Read UTC/local time New! at-a-glance. High-contrast 5/8" LCD, brushed aluminum frame. Batteries included. 4 1/4"Wx1Dx2H inches.

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

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

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

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0000	9580	Int. Radio of Serbia-Montenegro		0330	4775	Trans World Radio, Swaziland	vern
0000	11665	Radio France International	SS	0330	4976	Radio Uganda	
0000	9820	Radio Havana Cuba		0330	7545	Kol Israel	HH
0000	9925	Voice of Croatia, via Germany	Croatian	0330	4915	Radio Nacional, Brazil	PP
0000	4716	Radio Yura, Bolivia	SS	0355	6350	Voice of the Tigre Revolution (cland.)	vern
0000	6115	Radio Tirana, Albania	Albanian	0400	3280	Radio Maria/LV del Napo, Ecuador	SS
0030	9605	Vatican Radio	PP	0400	6090	University Network, Anguilla	
0030	15520	Radio Veritas Asia, Philippines	Tamil	0430	7205	BBC Relay, South Africa	FF
0030	4747	Radio Huanta 2000, Peru	SS	0430	6185	Radio Educacion, Mexico	SS
0030	15575	Radio Korea International, South Korea	JJ	0500	4940	Voice of America Relay, Sao Tome	
0030	5019	Ecos del Atrato, Colombia	SS	0500	5885	Voice of Greece	Greek
0100	15395	VOA Relay, Philippines	CC	0500	4950	Radio Nacional, Angola	PP
0100	15435	Far East Broadcasting Co., Philippines	unid	0530	4810	XERTA/Radio Transcontinental, Mexico	SS
0100	4386	Radio Imperio, Peru	SS	0530	3291	Voice of Guyana	
0100	7325	Radio Vilnius, Lithuania	Lithuanian	0600	4835	RTV Malienne, Mali	FF
0100	11800	RAI Int., Italy	II	0600	7125	RTV Guineenne, Guinea	FF
0100	9690	Radio Romania International		0600	4915	GBC, Ghana	
0100	11710	Radio Nacional, Argentina	SS	0700	7155	La Voix du Sahel, Niger	FF
0130	9440	Radio Slovakia International		0730	4885	Radio Clube do Para, Brazil	PP
0130	9715	RDP International, Portugal	PP	0800	6160	CKZN, Newfoundland	
0130	6957	La Voz del Campesino, Peru	SS	0800	6135	Radio Aparecida, Brazil	PP
0130	15180	Voice of Korea, North Korea		0900	13840	Italian Radio Relay Service	
0130	6120	Voice of Justice, via VOIRI, Iran		0930	4902	Radio San Miguel, Bolivia	SS
0200	6137	Radio UNAMSIL, Sierra Leone		1000	4775	Radio Tarma, Peru	SS
0200	7180	Voice of Russia via Moldova		1000	4870	La Voz del Upano-Rdf. Cultural, Ecuador	SS
0200	6973	Galei Zahal, Israel	HH	1000	6035	La Voz del Guaviare, Colombia	SS
0200	9570	Radio Budapest, Hungary	HH	1000	6045	Hamberger Lokalradio, via Julich, Germany	GG
0200	4780	Radio Cultural Coatan, Guatemala	SS	1000	4875	Radio Difusora Roraima, Brazil	PP
0203	7285	Voice of Croatia, via Germany	Croatian	1000	6135	Radio Santa Cruz, Bolivia	SS
0230	6175	Voice of Vietnam, via Canada		1030	7400	Deutsche Welle, Germany, via Russia	GG
0230	4750	Radio Peace, Sudan	sign on	1030	4940	Radio Amazonas, Venezuela	SS
0230	4965	The Voice, Zambia		1030	4955	Radio Cultural Amauta, Peru	SS
0230	7440	Voice of Russia	RR	1030	4875	Radio La Cruz del Sur, Bolivia	SS
0230	11675	Radio Kuwait	AA	1100	7305	Radio Thailand	Thai
0230	4800	Radio Buenas Nuevas, Guatemala	SS	1100	11795	Radio Korea Int., South Korea, via Canada	SS
0230	3340	Radio Misiones Int., Honduras	SS/EE	1100	9885	Radio New Zealand	
0300	3345	Channel Africa, South Africa		1100	13710	All India Radio	HH
0300	4910	ZNBC - Radio Zambia		1100	6399	Pyongyang Broadcasting Station, North Korea	KK
0300	3306	ZBC, Zimbabwe	vern	1100	4919	Radio Quito, Ecuador	SS
0300	3320	Radio Sondergrense, South Africa	Afrikaans	1100	4814	Radio Buen pastor, Ecuador	SS
0300	4052	Radio Verdad, Guatemala		1100	4781	Radio Oriental, Ecuador	SS
0300	4860	Voice of Iranian Kurdistan (cland..)	vern	1100	13610	China People's Broadcasting Station, China	CC
0300	6940	Radio Fana, Ethiopia	vern	1100	4900	Xizang PBS, Tibet	CC
0300	7110	Radio Ethiopia					

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
1130	6120	Radio Japan/NHK, via Canada		1900	11605	Kol Israel	
1130	11655	Radio Rebelde, Cuba	SS	1900	17800	Voice of Nigeria	
1130	9430	Trans World Radio, Guam		1900	17875	Radio Netherland, via Canada	
1200	21820	Deutsche Welle, Germany, via UAE	AA	1900	15470	Radio Ndeke Luka, Cent Af. Rep., via Germany	FF
1200	4890	NBC Papua New Guinea		1930	15205	Radio Jamahiriya, Libya, via France	AA
1200	6250	Pyongyang PBS, North Korea	KK	1930	11760	Radio Havana Cuba	SS
1200	6130	Lao National Radio, Laos	Laotian	1930	15175	Adventist World Radio, via Germany	AA
1200	9395	Deutsche Welle, Germany, via Kazakhstan	GG	1930	9635	Voz Cristiana, Chile	SS
1200	4830	China Huayi Broadcasting Co., China	CC	2000	11625	Vatican Radio	
1200	4900	Voice of the Strait, China	CC	2000	9605	IBRA Radio, Sweden, via Germany	AA
1230	6075	Radio Rossii, Russia	RR	2000	9960	Radio Farda, USA, via Sri Lanka to Iran	Farsi
1230	4790	Radio Republik Indonesia-FakFak, Indonesia	II	2000	11820	BSKSA, Saudi Arabia	AA
1230	5860	Voice of Jinling, China	CC	2000	13680	Radio Nacional Venezuela, via Cuba	SS
1230	9580	Radio Australia		2000	15150	Voice of Indonesia	various
1300	11515	Radio Free Asia, via Sri Lanka	unid	2000	13630	Radio Marti, US to Cuba	SS
1300	9810	Radio Thailand		2000	12080	Voice of America Relay, Botswana	
1300	15110	Radio Kuwait	AA	2030	15295	Adventist World Radio, via South Africa	
1300	9920	Voice of Russia	RR	2030	12085	Radio Damascus, Syria	AA
1300	9980	AFN/AFRTS, Iceland		2030	7105	Radio Romania International	GG
1300	11510	Radio Free Asia, USA, via Kazakhstan	unid	2030	9830	Radio Jordan	AA
1300	11530	Voice of Mesopotamia (cland.)	Kurdish	2030	9580	Africa Number One, Gabon	FF
1330	15240	Radio Sweden		2100	9525	Voice of Turkey	
1330	9865	BBC via Uzbekistan	unid	2100	15345	RTV Marocaine, Morocco	AA
1330	9715	Radio Tashkent Int., Uzbekistan		2100	9915	BBC Relay, Cyprus	AA
1330	15155	BBC Relay, Thailand		2100	7380	Voice of Biafra International, via South Africa	Saturdays
1330	21675	Radio Jamahiriya, Libya, via France	AA	2130	17830	BBC Relay, Seychelles	
1330	9690	All India Radio	unid	2130	17860	Deutsche Welle, Germany, via Rwanda	GG
1330	15140	HCJB, Ecuador	SS	2130	9575	Radio Medi-Un, Morocco	FF
1400	9465	KFBS, No. Marianas	RR	2130	9950	All India Radio	
1430	15265	Radio Taiwan Int.	Hindi	2130	17860	Deutsche Welle Relay, Rwanda	
1430	15385	Adventist World Radio, via UAE	CC	2200	9630	Radio Exterior de Espana, Spain	SS
1430	9740	BBC Relay, Singapore		2200	5840	Radio Ukraine Int.	
1430	15660	Sedaye Mellet-e Irana (cland.)	Farsi	2200	9590	Radio Netherland Relay, via Madagascar	Indonesian
1500	9645	Voice of America Relay, Sri Lanka		2200	6055	Voice of Islamic Republic of Iran	AA
1500	17870	Radio Rhino Int., to Uganda via Germany		2200	6005	Deutschland Radio	GG
1500	13775	Radio Austria Int.		2200	9415	Radio Prague, Czech Republic	
1530	17770	Channel Africa, South Africa		2200	6180	Cyprus Broadcasting Corp.	Greek; wknds
1600	15120	Voice of Nigeria		2200	17815	Radio Cultural, Brazil	PP
1600	15605	Radio France International		2200	5900	Radio Bulgaria	unid
1600	17485	Radio Prague, Czech Republic		2230	11550	Radio Australia, via Taiwan	
1630	11690	Radio Jordan		2300	4845	Radio Mauritanie, Mauritania	AA
1630	11755	YLE/Radio Finland	Finnish	2300	11675	Radio New Zealand	
1630	13665	YLE/Radio Finland	Finnish	2300	17680	Voz Cristiana, Chile	SS
1630	11840	Voice International, Australia		2300	9700	Radio Bulgaria	
1700	21655	RDP International, Portugal	PP	2330	7300	Voice of Turkey	TT
1700	21600	Radio Japan/NHK, via French Guiana	JJ	2330	9855	Radio Kuwait	AA
1745	17810	United Nations Radio, via Ascension		2330	17880	Adventist World Radio, Guam	CC
1800	12005	RTV Tunisienne, Tunisia	AA	2330	5030	RTV Burkina, Burkina Faso	FF
1800	13670	Radio Free Asia, via Northern Marianas	Tagalog	2330	9570	China Radio Int., via Albania	
1800	9855	Radio Cairo, Egypt	AA	2345	9845	CPBS, China	CC
1800	12050	Egyptian Radio	AA	2130	9590	Radio Centrafrique, Central Af.. Republic, via Germany	FF
1830	17595	Radio Exterior de Espana, Spain	SS	2130	11830	Radio Budapest, Hungary	HH
1830	17895	VOA Relay, Morocco		2130	9990	Radio Cairo, Egypt	
1830	15355	Radio Japan/NHK, via Gabon	JJ	15435	1530	Emirates Radio, United Arab Emirates	AA
1830	11630	Radio Rossii, Russia	RR				
1830	15475	Africa Number One, Gabon	FF				
1830	9960	VOA, via Armenia	AA				
1900	11950	BSKSA, Saudi Arabia	AA				

New, Interesting, And Useful Communications Products

Motorcycle Mount Gives Bikers Satellite Radio

XACT Communication and Kuryakyn USA have just announced the release of a satellite radio receiver mount, made specifically for recreational vehicles. Designed and distributed by Kuryakyn USA, the custom-fitted bracket mount will allow motorcycle, scooter, and quad enthusiasts to listen to commercial-free SIRIUS Satellite Radio via an XACT Stream jockey Plug + Play Satellite Radio Receiver, anywhere in the United States. The custom made bracket will fit most motorcycles on the market (including Harley-Davidson, Honda, BMW, Yamaha, Buell, Suzuki, and Kawasaki) and allows for several mounting options to provide the cleanest look and fit. Available in chrome and black, the mount bracket is aesthetically appealing, as well as functional and durable. Motorcyclists will have the ability to listen to SIRIUS with their XACT Stream jockey, either with FM modulation through their existing stereo or through direct helmet-headset plug-in. Kuryakyn USA also provides pre-amped speakers for additional options for music listening on a recreational vehicle. With the XACT Stream jockey satellite radio receiver, listening is not exclusively confined to the vehicle. The receiver can be easily "plugged" into the motorcycle mount, a home stereo system, or one of XACT's wide assortment of satellite radio accessories, including boom boxes and the Portable Pod.

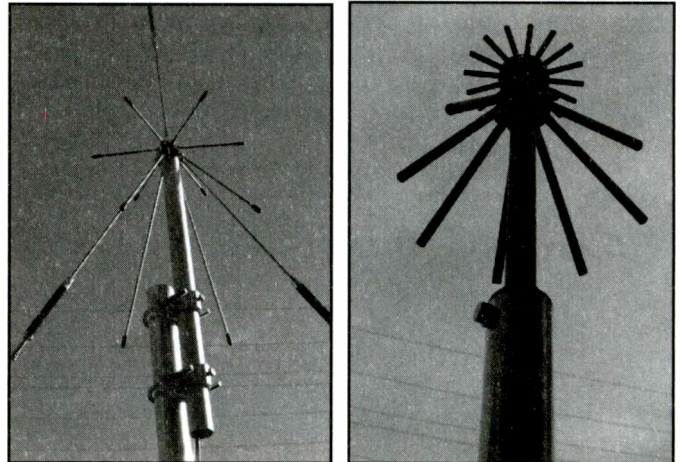
For more information on the new motorcycle mount, contact the company at www.xactcommunication.com or call 866-466-9228.



Here's a look at the XACT satellite receiver mount designed for recreational vehicles.

AOR Announces Two New Wideband Coverage Discone Antennas

AOR USA has announced the release of two new discone antenna systems designed for broad bandwidth and featuring professional-grade construction. According to the company, the DA5000 and DS3000A are designed to maximize the oper-



AOR's new wideband discones are perfect for the radio monitor or amateur operator. One antenna can do the work of multiple antennas!

ation of newer receivers capable of capturing signals of 2 GHz or more, and will simplify operations for the user, allowing one antenna to do accomplish what often requires multiple antennas and feed lines. In addition to reception, the DS3000A also has the capability to handle multiband transmitters.

The DA5000 is a very high performance commercial-grade UHF discone antenna covering frequencies from 700 MHz to 3 GHz. At one foot high and weighing 1.6 pounds, the DA5000 presents a small wind load and is built to exacting tolerances. AOR recommends the use of low-loss cable to derive maximum performance from the DA5000. The antenna feed point has a low-loss Type N connector. The DS3000A can receive from 75 MHz to 3 GHz. Built to precision standards, its relatively small size (2.9 feet high) and lightweight (1.55 pounds) also presents a small wind load, though it can also be mounted in confined areas. The DS3000A can support transmitting on 144, 430, 904, and 1200 MHz, safely handling loads up to 50 watts. The antenna system includes mounting hardware for standard masts and 10 meters (33.8 feet) of low-loss RG58A/U cable terminated in a Type N connector.

The manufacturer's suggested retail price for the DS3000A is \$129; MSRP for the DA5000 is \$339. Dealers are free to set their own prices and often discount from the MSRP. For more information, contact AOR USA at www.aorusa.com or write to them at 20655 S. Western Ave., Suite 112, Torrance, CA 90501. They can also be reached at 310-787-8615.

GeoSentry, Inc., Introduces Pocket-Sized MiniTracker GPS System

GeoSentry, Inc., provider of covert wireless tracking solutions for security and surveillance, has introduced the small,

portable MiniTracker MT-100 GPS system for discreet and reliable location information and monitoring of high-value assets and individuals. The MiniTracker MT-100 system offers a unique combination of portability, immediate out-of-the-box operation, and enhanced GPS capability that does not need to "see" the sky to determine the device's location, according to the company. The combination of portability, ease of use, continuous tracking and monitoring, and covert deployment make the MiniTracker suitable for law enforcement, drug agencies, executive security firms, shippers of high-value and hazardous cargo, and the intelligence community. To assure continuous tracking in GPS-limited environments, GeoSentry's new MiniTracker employs SureTrak 4-in-1, a suite of location capabilities that includes enhanced GPS sensitivity, cell tower estimation, and an RF beacon and buzzer. As a result, the MiniTracker can continue to provide location information even in the absence of GPS satellite coverage. MiniTracker uses a GSM cellular communications link to provide position updates, which can be displayed and monitored on a secure webpage, permitting access to real-time monitoring and histories with a click of a mouse button. Alerts can be sent from the MiniTracker to designated pagers, e-mail addresses, and mobile phone numbers. The ability to send multiple alerts to specified locations further enhances the MT-100's value in security applications. Because there are no external wires required for power or antennas, the slim-profile MiniTracker can be deployed in minutes. For covert deployments in harsh or hostile physical environments, the MiniTracker can be coupled with GeoSentry's newly introduced Slap-N-Track enclosure, a rugged, waterproof, NEMA-compliant housing featuring an 85-pound magnet which attaches instantly to any flat metal surface.

Initial GeoSentry service is available in the U.S. and Canada; future service is planned for Europe, the Middle East, South America, Asia, and Africa.

For more information, visit the company's website at www.geosentry.biz.

New Infrared Remote Control For JRC NRD-545 Receiver

Swl-remotes.com has just introduced a new product for infrared remote con-



Swl-remotes' new SWL IR Remote control for the JRC NRD-545 receiver is a full-featured remote control unit that sells for \$89.95.

trol of the JRC NRD-545 receiver. You can now control your NRD-545 while relaxing in your easy chair, instead of hunched over the receiver. The SWL IR Remote is a full-featured remote for the NRD-545 that permits control of the receiver using a standard TV Universal Remote. Use the Universal Remote to enter frequencies directly, move through frequencies, and set modes. The memories on the NRD-545 can be directly entered, stepped through, transferred to the VFO, and saved from the VFO to memory. All front panel analog controls, including volume, can be controlled from the Universal Remote. If you have the Wideband Converter option (CHE-199) installed, the SWL IR Remote will work in the frequency range up to 1,999 MHz. The buttons on the Universal Remote are in an intuitive layout for ease of operation. The SWL IR Remote is very easy to operate with a minimum of keystrokes to perform the operations, and the built-in LED gives feedback on the operation and status of the remote. The SWL IR Remote connects to the NRD-545 RS232-C connector with the supplied Null Modem cable and uses the communications protocol built into the NRD-545 receiver. No receiver modifications are necessary to use the SWL IR Remote. The supplied DC wall adapter supplies power for the control unit.

The SWL IR Remote from swl-remotes.com costs \$89.95; the universal remote is sold separately. A comprehensive Operating Manual is available as a download from the company website. For more information visit <http://www.swl-remotes.com>.

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African Shortwave Enjoys A Resurgence

Recent weeks have seen an unusual amount of African activity on the bands. It's good to have **RTV Gabonaise** (Radio Gabon) back on the air on its former **4777** spot and being fairly widely heard in the East to closing at 2300, and also from 0500 sign on. So far it's unclear whether **7270** is also back. Reports on this one should go to B.P. 10150, Libreville.

And **Radio Centrafrique**, in Bangui, Central African Republic, recently appeared on **9590**, noted as early as 1700 and running to 2300 close. The trouble is, though, it's not the real thing, but rather a relay via France's Issoudun transmitter site. At least it's a step in the right direction!

Radio Lubumbashi in Congo-Kinshasha is being reported for the first time in many years on **7205v**, but unfortunately the timing is poor, from 1900 to 2000, which is too early in the day to be of much use to any but those on the eastern seaboard.

Also back is **Radio Nacional**, Bata, Equatorial Guinea, which had gone silent some months ago due to transmitter problems. Check **5005** from around 0500. Reports go to Apartado 749, Bata, Rio Muni, Equatorial Guinea. The Malabo transmitter (**6250**) was also in disrepair for a number of months, but that one should be active again by the time you read this. Check for them from 0500 sign on.

And, as mentioned briefly last time, **Radiodiffusion National Tachadienne** has also taken to the air again and is widely heard on **6165** from 0500, sometimes at excellent strength. You might also catch it between 2100 and 2200. Reports on this one go to B.P. 892, N'Djamena.

The **Voice of Nigeria** now seems to have its 31-meter band channel active. **9690** was reported to be in operation a number of months back, but no receptions were noted back then. More recently this frequency has been noted in use after 1800. It's listed as active only from 1000 to 1600.

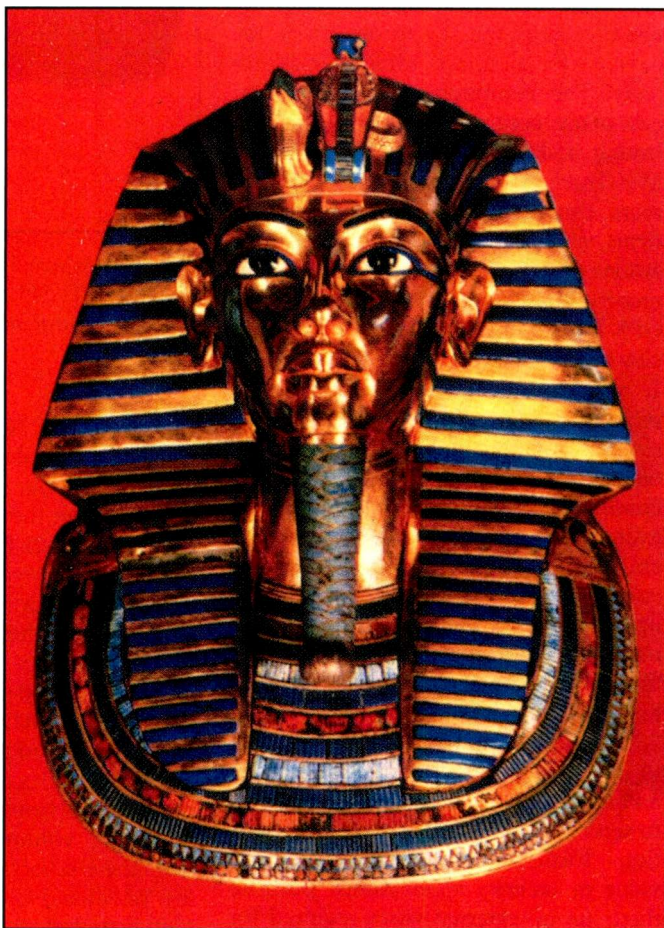
Government Busy Work: Name Changes!

It may have happened already, but if not, watch for a name change for Radio Free Europe/Radio Liberty. The government's International Broadcast Bureau (IBB)—always looking for something to do—is said to be planning to combine the two services and change the station's name to Radio Liberty International. When these services went on the air back in the 1950s, Radio Free Europe beamed to the communist nations of Eastern Europe, and Radio Liberty focused its efforts on the Soviet Union. In the years since communism's collapse in 1991 the two services have had trouble finding a focus for their efforts. We'll see how all this jells and where Radio Farda and the others fit into the new scheme.

More Station News

A new anti-Vietnam broadcast is **Radio Que Me**, aired via Tashkent on **15385** from 1200 to 1230, but seemingly only on Saturdays.

Ecuador's **La Voz del Upano**, which many DXers have heard on their **5040** or **4870** frequencies, has added new **5999v**, which



Could this be the fellow in charge of modulation quality at Egyptian Radio? (Thanks Robert Charlton)

is active from around 1000. I'd wager that this is a very tough spot in the evenings, with Cuba just a few hundred Hertz higher.

That odd **Radio Buluarte** is active again in Argentina. Try **6215** in the early evenings, around 0000.

Christian Vision, which started broadcasting from Chile just a few years ago, has added yet another outlet: Bulgaria! It's using Radio Bulgaria transmitters on **9680** to West Africa from 1800 to 2000. It also uses **15650** from 1600 to 1800. This organization also broadcasts as Christian Voice (from Zambia) and Voice International (from Darwin, Australia).

Broadcast Logs

Remember, your shortwave broadcast station logs are always welcome. Just be sure to double or triple space them, list them by country, and include your last name and state abbreviation after each log. Also needed are spare QSLs you don't need returned, station schedules, brochures, pennants, photos, and anything else you think would be of interest. And why oh why are there no folks brave enough to send in a shack photo?

Wouldn't you like to see your fellow reporters at their receivers? Who'll start the ball rolling?

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

ALBANIA—Radio Tirana, **6115** in Albanian at 0015. Also **6205** in Albanian at 2225, ID 2230. (DeGennaro, NY)

ANGOLA—Radio Nacional, **4950** in PP at 0525. (DeGennaro, NY)

ANGUILLA—Caribbean Beacon, **11775** with Dr. Scott preaching at 1311. (Newbury, NE) The same heard at 2052. (Charlton, ON)

ANTIGUA—BBC Relay, **5975** at 0000. (Newbury, NE) **15190** with soccer at 1646. (Charlton, ON)

ARGENTINA—Radio Nacional/RAE **6060** with news in SS at 0009. Also **15345** with SS to Europe at 2147. (DeGennaro, NY) **11715** (not 11710?—*gld*) in SS at 0108.

Help Wanted!

We believe the "Global Information Guide" consistently presents more short-wave broadcast loggings than any other monthly SW publication! (This month we processed just under 700 loggings!) Why not join your fellow SWLs and let us know what you're hearing and you'll be eligible for our monthly shortwave book prize as well! Send your logs to "Global Information Guide," *Popular Communications*, 25 Newbridge Road, Hicksville NY 11801-2953. Ore-mail them to Editor Harold Ort at popularcom@aol.com, or to your "Global Information Guide" columnist at gdex@genevaonline.com (please see the column text for basic formatting tips). We look forward to hearing from you!

(Charlton, ON) RAE, in SS at 2220 on 15345 in SS. (Brossell, WI) 2340. (Newbury, NE)

ARMENIA—Voice of Armenia, **9960** heard at 1839 in AA with very poor audio. (Charlton, ON)

ASCENSION IS.—BBC relay. **7105** in FF at 0448. (MacKenzie, CA) **15190** with news at 1300. (Northrup, MO) **15390** in PP to Brazil at 2137 and **15400** to West Africa at 1830. (DeGennaro, NY) 1904. (Wood, TN) Family Radio **15195** at 2006. (Brossell, WI) 2026. (Jeffery, NY) United Nations Radio

(via), **17810** with "United Nations Today" heard at 1744. (Charlton, ON)

AUSTRALIA—Radio Australia, **6020** to Pacific and WCNA at 1105. Also **9475** at 1150, **9580** at 1041, **9710** in Pidgin with rebroadcast of program from Port Moresby at 1047 and **11550** via Taiwan with EE for Indonesian speakers at 2235. (DeGennaro, NY) 9580 at 1307. (Newbury, NE) 1315. (Northrup, MO) 9580/9590 with "Planet" program at 1353 and **21740** at 2242. (Charlton, ON) VL8A-Alice Springs, **4835**

Abbreviations Used In This Month's Column

(p)	—	presumed	LV	—	La Voz
(t)	—	tentative	NBC	—	National Broadcasting Corporation (Papua New Guinea)
//	—	parallel	ORTB	—	Office de Radiodiffusion et Television du Benin
AA	—	Arabic	PBS	—	People's Broadcasting Station (China)
AFN	—	Armed Forces Network	PP	—	Portuguese
AFRTS	—	Armed Forces Radio TV Service	PSA	—	public service announcement
AIR	—	All India Radio	QQ	—	Quechua
anmt(s)	—	announcement(s)	RCI	—	Radio Canada International
anner	—	announcer	Rdf	—	Radiodifusora, Radiodiffusion
AWR	—	Adventist World Radio	REE	—	Radio Exterior de Espana
BSKSA	—	Broadcasting Service of the Kingdom of Saudi Arabia	RFA	—	Radio Free Asia
CC	—	Chinese	RFE/RL	—	Radio Free Europe/Radio Liberty
co-chan	—	co-channel (same) frequency	RNZI	—	Radio New Zealand International
comm1	—	commercial	RR	—	Russian
CP	—	Bolivia, Bolivian	RRI	—	Radio Republik Indonesia
CRI	—	China Radio International	RTBF	—	RTV Belge de la Communaute Francasie
DD	—	Dutch	relay	—	site not owned by broadcaster
DJ	—	disc jockey	Relay	—	owned/operated by the broadcaster
DW	—	Deutsche Welle/Voice of Germany	s/off	—	sign off
EE	—	English	s/on	—	sign on
i/by	—	followed by	SIBS	—	Solomon Is. Broadcasting Corp.
FEBA	—	Far East Broadcasting Association	sked	—	schedule
FEBC	—	Far East Broadcasting Company	SLBC	—	Sri Lanka Broadcasting Corp.
FF	—	French	SS	—	Spanish
GBC	—	Ghana Broadcasting Corp.	TC	—	time check
GG	—	German	TOH	—	top of the hour
HH	—	Hebrew	TT	—	Turkish
HH	—	Hungarian	TWR	—	Trans World Radio
HOA	—	Horn of Africa	unid	—	unidentified
ID	—	identification	USB	—	upper sideband
I	—	Italian; Indonesian	UTE, ute	—	utility station
Int	—	International	v	—	variable
IRRS	—	Italian Radio Relay Service	vern	—	vernacular (local language)
IS	—	interval signal	VOA	—	Voice of America
JJ	—	Japanese	VOIRI	—	Voice of Islamic Republic of Iran
KK	—	Korean	ZBC	—	Zambian Broadcasting Corp.
LSB	—	lower sideband			

with interview, then ABC News at 0930. (Alexander, PA) 0920 with pops, Pacific region news. (Barton, AZ) 1155 ending program on the economy and into news at 1200. (Brossell, WI) Voice International, **11840** at 1645 and "Voice International—your global radio" at 1700. (Taylor, WI)

AUSTRIA—Radio Austria Int., **5945** in GG to America at 2034, **6155** in GG to Europe at 2202, **13670** in GG to Europe at 1130 and **13675** via Canada at 1635. (DeGennaro, NY) 6155 with light classics at 0539. (Taylor, WI) **9870** in EE to Europe at 2351 and **13775** via Canada with "Report from Austria" at 1509. (Charlton, ON)

BELGIUM—Radio Vlaanderen Int., **5965** via Germany in Flemish at 0749. (DeGennaro, NY) **9945** via Russia in unid language at 1204. (Brossell, WI) **11635** (Bonaire) with current events feature at 2205. **13685** in DD at 1916. (Charlton, ON) (*Note: These relays have probably been discontinued as RVI does the downsize dance.*—gld)

BOLIVIA—Radio Municipal, Caranavi, **4845.2** at 0932 with rustic vocals and man in SS, ID at 0946 mentioning its shortwave frequency. Covered by the Brazilian at 0950. (D'Angelo, PA) Radio San Miguel, Riberalta, **4902** at 0940 with ID at 1000. (Wilkner, FL) 1005 with SS talk, ID 1007, SS ballads. (Alexander, PA) 2340 with woman and long SS religious talk. (D'Angelo, PA) Radio Santa Cruz, **6134.8** at 0946 with SS ballads, ID at 0950. (Alexander, PA; DeGennaro, PA) La Cruz del Sur, La Paz, **4874.8** at 1027 with SS religious talks, quick ID, vocal. (D'Angelo, PA) Radio Nueva Esperanza, La Paz, **6585.4**, weak at 0930. Also noted at 2330. (Wilkner, FL) Radio Yura, Yura, **4716.2** with long talk by woman. Very poor. (Strawman, IA) Radio Guanay, Guanay, (t) **4761.7** very poor in SS at 2330. (Wilkner, FL)

BOTSWANA—VOA Relay, **9885** with "News Now" programming at 0339. (D'Angelo, PA) **12080** in FF 2009. (Brossell, WI) 1930. Also **15580** in EE at 1904. (Charlton, ON) **17895** at 1930. (Paradis, ME)

BRAZIL—(All in PP) Radio Nacional Amazonia, **6185** with call-ins, ID, address. Also **11780** with futbol match at 2007. (DeGennaro, NY) 11780 with woman in PP at 2332. (Newbury, NE) 0109. (Charlton, ON) Radio Cultura Ondas Tropicais, Manaus, **4845.2** from 0950 sign on with choral national anthem and sign on anmts. (D'Angelo, PA) Radio Difusora, Londrina, **4815** with preaching in PP at 2332. (D'Angelo, PA) Radio Record, Sao Paulo, **6150** with man/woman taking phone calls at 2215. (D'Angelo, PA) Radio Educacao Rural, Tefe, **4925** with news at 1022. (DeGennaro, NY) 0020 with futbol. (Strawman, IA) Radio Aparecida, Aparecida, **6134.9** at 0757 with PP anmts, talk, ballads, ID at 0800. Weak on //9630. (Alexander, PA) **9630** with call-ins at 0051. Also **11855** at 0057 with religious message. (DeGennaro, NY) Radio Guiaba, Porto Alegre, **11785** with conversation between two annrcs at 0049.

(DeGennaro, NY) Radio Bandeirantes, Sao Paulo, **9645** at 2123 with discussion, ID, commls, 5+1 time pips at 2130. (D'Angelo, PA) 2219 with talk about coffee. (DeGennaro, NY) Radio Educacao Rural, Coari, **5035** with local news at 2154. (DeGennaro, NY) Radio Cultura, Sao Paulo, **9615** at 2215 with two men talking, songs. Also **17815** at 2231. (DeGennaro, NY) 2320 with romantic ballads, brief PP anmts, ID. Better on //9615. (Alexander, PA) Radio Brazil Central, Goiania, **4985** with music and commls at 0735. Also **11815** with religious message at 2313. (DeGennaro, NY) Radio Difusora, Acreana, **4885** with talks and ID at 0310. (Brossell, WI) Radio Cancao Nova, Cachoeira Paulista, **9675** with soft religious vocals and religious talk at 2115. (D'Angelo, PA) 2235 with religious talk. (DeGennaro, NY) 0110. (Charlton, ON) Radio Educadora, Braganca, **4825** with music and talk at 0924. (DeGennaro, NY) Radio Senado, Brasilia, **5990** with domestic news at 0943. (DeGennaro, NY) Radio Marumby, Florinapolis, **9665** at 0045 with talk and music. (DeGennaro, NY) Radio Difusora, Taubate, **4924.5** at 0958 with local event anmts, commercials. (DeGennaro, NY) Radio Rural, Santarem, **4765** with talks at 0919. (DeGennaro, NY) Radio Nacional, Macapa, **4915** at 0239. (Jeffery, NY) 0321. (Brossell, WI) 0510. (MacKenzie, CA) 0535. (DeGennaro, NY) 0757. (Alexander, PA) Radio Anhanguera, Goiania, **4915** with call-in program at 0954. (DeGennaro, NY) Radio Clube do Para, Belem, **4885** with music at 0730. (DeGennaro, NY) Radio Difusora Roraima Londrina, Boa Vista, with pops at 0150. (Strawman, IA) 0227 with talk. (Jeffery, NY) 0312. (Brossell, WI) 1000 with ID, prayer, music. (DeGennaro, NY) Radio Educadora de Guajara, Mirim, **3375.1** heard at 0917 with lively morning program with IDs, TCs, commls. (D'Angelo, PA)

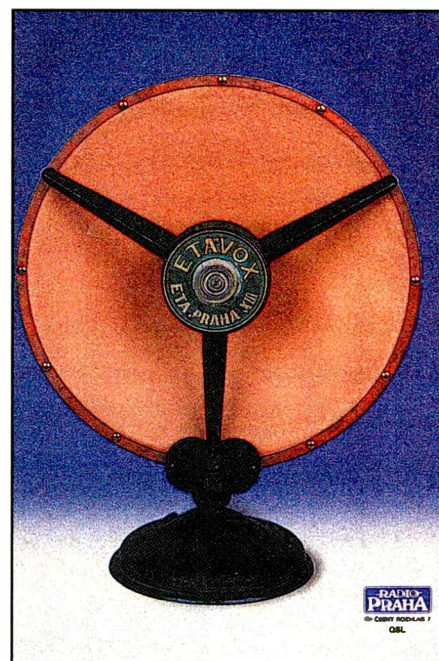
BURKINA FASO—Radio TV Burkina, **5030** at 2140 in unid language with talks and occasional short replies by others. (DeGennaro, NY) 2340 with FF talk, variety of Euro and Afro-pops. Off at 0001. University network signs on at 0000. (Alexander, PA)

BULGARIA—Radio Bulgaria, **5800** at 2147 with ID and schedule. EE at 2200. Also **5900** in unid language at 2209, **7400** in BB at 0254, **9700** in EE at 0013, **11700** in GG at 1133. (DeGennaro, NY) 9700 at 2300 and 11700 in SS at 2329. (Charlton, ON) 9700 in FF at 0215, // 7400. (Newbury, NY)

CANADA—CKZN, Newfoundland, **6160** with program on crab fishing at 2000. (Paradis, ME)

CHAD—Radiodiffusion Nationale (p) **6165** monitored at 0548 with phone numbers and address. Man and woman in FF talks, music interludes. Heavy QRM. (Wood, TN)

CENTRAL AFRICAN REPUBLIC—Radio Ndeke Luka, **15470** via Germany heard at 1907. Off at 1929. (Charlton, ON)



A 1927 Czech speaker is one of a QSL series from Radio Prague. (Thanks Robert Charlton)

CHILE—Voz Christiana, **9635** in SS at 1944 and **11745** in SS at 0144. Also **17680** in SS at 2332. (Charlton, ON) **9780** at 1103 with apparent rebroadcast of an Argentina FM station (97.1) with religious message. (DeGennaro, NY) 17680 with SS, rock group. (Newbury, NE)

CHINA—China Radio Int., **5990** via Cuba in SS at 0021, **6175** in PP at 2221, **7190** in presumed KK to East Asia at 1118, **7255** in RR to East Asia at 1125, **7290** in RR to East Asia at 1047. Also **9440** in unid language to SE Asia at 1109, **9570** possibly via Canada in EE at 0054, **9580** via Cuba in EE at 0131, **9640** in SS to West Europe at 2223, **9745** possibly via Canada in SS at 0027, **9785** in CC at 1200, **11640** via Mali at 2012, **11700** in Malay or Indonesian at 1112, **11975** via Mali in CC to North Africa at 2259 and **13630** via Mali at 2129 closing EE into FF. (DeGennaro, NY) 9580 via Cuba at 0118, 11640//**13630** via Mali at 2117 and **11970** with letters at 2337. And **13685** via French Guiana in SS at 0224. (Charlton, ON) **7405** at 1510. (Newbury, NE) 9570 via Albania from 2357 sign on to North America. (D'Angelo, PA) **9865** with time pips, ID at 2030. Also 11970 via Mali at 2315. Maybe replacement for 13680. (Barton, AZ) **11640** via Mali at 2000. (Paradis, ME) **15100** in CC at 0000. (Linonis, PA) **15230** at 1310. (Northrup, MO) CPBS/CNR, Beijing, **7345** in CC at 1242. (Brossell, WI) CNR-1, **6175** in Mandarin at 1338. (Taylor, WI) **9820** in CC at 2348, **9845** in CC at 2344, // **9830**, **15670** in CC at 0037, **17605** in CC at 0032 and **17625** in CC at 0025. (MacKenzie, CA) **9810**-Xi'an in CC at 1154. (D'Angelo, PA) **13610**-Nanning, in CC at 1118. (DeGennaro, NY) Qinghai PBS, **6145** in Mandarin at 1157.

Nombre: Sr. Richard A. D'Angelo
 Dirección: [REDACTED] WYOMISSING, PA 19610
U.S.A.
 Agradecemos su Reporte:
 del día 07 de Septiembre de 2004 en la Frecuencia 4.940.042
09:37 a 10:14 UTC.
 Gracias por tan valiosa colaboración.
 RADIO AMAZONAS, S.A.
 Puerto Ayacucho, Estado Amazonas.
 VENEZUELA
 Ángel M. Pérez
 DIRECTOR
 ORHELION

A QSL from Radio Amazonas, one of the few active Venezuelan stations these days. (Thanks Rich D'Angelo, PA)



Trans World Radio's colorful QSL confirmed reception of its Monte Carlo broadcasts. (Thanks Rich D'Angelo)

(Strawman, IA) Xizang PBS, Lhasa, **4905** in presumed Tibetan with songs at 1114. (DeGennaro, NY) China Huayi Broadcasting Co., **4830** in CC with Doris Day songs at 1204. (D'Angelo, PA) Voice of Jinling, Nanjing, **5860** in CC at 1251. (Brossell, WI) Voice of the Strait (p) **4900** at 1226 with continuous pop vocals. (D'Angelo, PA) Shijiazhuang PBS, **6950** in CC at 2200. (Paradis, ME) 2245 with Mandarin held until 2337 fade and SS UTEs took over. (Taylor, WI) China Music Jammer, **15510** over Radio Free Asia at 1940. (Brossell, WI) **17765** against VOA Philippines at 0005. (MacKenzie, CA)

CLANDESTINES—Radio Rhino Int., **17870** to Uganda via Germany from 1500 sign on with EE news, U.S. pops and country, more news and features. Weekdays only. (Alexander, PA) Radio Marti, **11930** in SS at 1852. (Newbury, NE) **13630** with sports coverage at 2019. (Charlton, ON) Voice of Mesopotamia, **11530** via Moldova in presumed Kurdish at 1310. (Brossell, WI) 1356 with talk and off at 1358. (DeGennaro, NY) Voice of the Tigre Revolution, **6350** from 0355 sign on with flute, vernacular talk. //5500. (Alexander, PA) Sedaye Mellet-e Irana (Voice of the Iranian Nation) **15660** via Germany, 1427 sign on with brief music, woman annr, then man with clear ID and opening anmts in Farsi. (D'Angelo, PA) Radio Payam-e Dost, **7460** via Moldova in unid language at 0304 to close at 0315. (DeGennaro, NY) Radio Farda, **5985** via Morocco in Farsi at 0045. (DeGennaro, NY) **9960** via Sri Lanka at 2103. (Brossell, WI) Voice of Biafra Int., **7380** via South Africa from 2100 sign on in EE, local music, ID, EE prayer, news. Saturdays only. (Alexander, PA) Radio Free Asia, **9905** via Palau in CC at 1635 and **11945** via Northern Marianas at 1650. (Newbury, NE) **11510** in unid language at 1304 and **11515** Sri Lanka in unid Asian language at 1313. (Brossell, WI) **15450** via Northern Marianas in possible VV at 0050. (MacKenzie, CA) **11950** via Northern Marianas in possible CC at 2000. (Paradis,

ME) **13670** via No. Marianas in possible Tagalog at 1815. (Linonis, PA) Voice of Iranian Kurdistan, **4860** at 0300 in possible sign on, martial music, call to prayer at 0305. (Alexander, PA)

COLOMBIA—La Voz de tu Conciencia, Puerto Lleras, **6009.8** with songs and religious messages at 1036. (DeGennaro, NY) Ecos del Atrato, Quibdo, **5019** with music, commls, anmts in SS at 0056. (DeGennaro, NY) La Voz del Guaviare, San Jose Guaviare, **6035** in SS at 1025. (DeGennaro, NY)

COSTA RICA—University Network, **5029** with Gene Scott at 0554. (Newbury, NE) **9725** at 0121. (Charlton, ON) Radio Exterior de Espana Relay, **5970** in SS at 1235. (Northrup, MO)

CROATIA—Voice of Croatia, **6165** at 2118 in Croatian with news items, occasional interview. (This is the station causing the QRM to Chad.—gld) **7285** via Germany in Croatian at 0248. Also **13830** in Croatian at 1133. (DeGennaro, NY) **9925** via Germany in Croatian at 0004. (Charlton, ON)

CUBA—Radio Havana Cuba, **9550** at 0525. (Wood, TN) 9550 in FF at 0055, **9820** in SS at 0008, **11760** in EE at 2102 and **15120** in SS at 2245. (Charlton, ON) 11760 in Esperanto at 1947. (DeGennaro, NY) Radio Rebelde, **5025** in SS at 0740. Also **11655** in SS at 1145. (DeGennaro, NY) 0000 in SS. (Linonis, PA)

CYPRUS—Cyprus Broadcasting Corp., **6180** in Greek at 2219 and **9760** in Greek at 2220. (DeGennaro, NY) (weekends only—gld) BBC Relay, **9915** in AA at 2108. (Charlton, ON) 2100 with ID and into AA. Also on **15180** at 1720. (Brossell, WI)

CZECH REPUBLIC—Radio Prague, **5930** with EE news at 2005, **6200** in Czech at 0243, **7345** at 0107, **9435** in SS at 2155, **9880** in GG at 1124, **11640** at 1137. (DeGennaro, NY) 6200 in SS at 0315. (Brossell, WI) **9415** at 2228, **13580/21745** at 1320 and **17485** at 1605, all in EE. (Charlton, ON)

ECUADOR—La Voz del Upano, Macas, **4869** at 0945 with Ecuadorian ballads, open-

ing ID as "Radiodifusora Catolica Cultural... La Voz del Upano" at 1000. Also frequencies and several LV Upano IDs. Religious programming at 1005. (Alexander, PA) 1010. (DeGennaro, NY) Radio Oriental, Tena, **4781.3** in SS at 1115. (Wilkner, FL) Radio Buen Pastor, Saraguro, **4814** with religious message in SS at 1053. (DeGennaro, NY) Radio Quito, **4919** in SS at 1057, ID at 1059. (DeGennaro, NY) La Voz del Napo, Tena, **3279** with SS religious talks at 0544. (DeGennaro, NY) (Probably carrying Radio Maria programming.—gld) La Voz de Saquisili, **4902** in SS at 2258. (DeGennaro, NY) HCJB, **9745** in SS at 0102 and **12005/21455** in EE at 1326. (Charlton, ON) **9785** in GG at 0226. (Newbury, NE) **15140** in SS at 1330. (Northrup, MO)

EGYPT—Radio Cairo/Egyptian Radio, **7155** with AA/EE lesson at 0140, **9735** in AA at 2358, **9855** in AA at 1859, **9990** in FF to Europe at 2020, **12050** in AA at 1907. (DeGennaro, NY) 9990 in FF at 2105. (Brossell, WI) 9990 in EE at 2154, AA at 2239, **9855** in AA at 1820 and **11725** with AA/EE lessons at 0006. (Charlton, ON) 12050 in AA at 1800. (Paradis, ME)

ENGLAND—BBC, **9525** at 0115, **12095** via Ascension in EE at 1940, **15400** at 2109, **15190** at 1634, **17820/21470** at 1600 and **21490** via South Africa in Swahili at 1645. (Charlton, ON) **12095** to South America at 0108. (DeGennaro, NY) **15565** at 1710. (Newbury, NE)

ETHIOPIA—Radio Ethiopia, **9704v** at 0305 in vernacular, with local music, drama. Better on //7110. (Alexander, PA) 1424 with music. (Strawman, IA) Radio Fana, **6210** at 0257 with chimes IS, vernacular talk, local music. Poor, and weaker on//6940. (Alexander, PA)

FINLAND—YLE/Radio Finland, **11755** in Finnish to Europe at 1638, **13665** in Finnish at 1628. (DeGennaro, NY) **15400** in Finnish at 1553 and "Finnish as a Second Language." (Charlton, ON)



MINIVAN RADIO



VERIFICATION STATEMENT FOR MINIVAN RADIO/INDEPENDENT RADIO

This is to confirm your reception of our station, Minivan Radio which you heard on the Date of 29th August 2004.

Reception was on the frequency of 13855 kilohertz meters from 16:00 hours sign-on to 17:00 hours sign-off Universal Time.

Thank you for your interest.

Friends of Maldives 64 Milford Street, Salisbury SP1 2BP Tel: 01722 504 330
admin@friendsofmaldives.co.uk www.friendsofmaldives.co.uk

This letter confirmed D'Angelo's reception of Minivan Radio—The Friends of the Maldives broadcast via Julich, Germany.

FRANCE—Radio France Int., **7135** in Romanian to Europe at 2105, **7270** via Ascension in FF to Central/South America at 0409, **11845** in FF to North Africa at 1038. (DeGennaro, NY) 7270 via Ascension in FF at 0439, **17710** via Japan in FF at 0020. (MacKenzie, CA) **11670** in RR at 1830. (Linonis, PA) **11955** (via Gabon—gld) in FF at 1946, **15475** in FF at 1639, **15605** in EE at 1625, **17515** in EE at 1440, **17620** in FF at 1645. (Charlton, ON) 11955 via Gabon at 2057 in FF then IS and EE ID at 2100. (Brossell, WI) **15300** in FF at 1230. (Northrup, MO)

FRENCH GUIANA—RFI Relay, **11665** in SS at 0002. (Charlton, ON) **11670** in FF at 1103. (DeGennaro, NY)

GABON—Africa No. One, **9580** in FF with lively African music at 2045. (Barton, AZ) 2157. Also **15475** in FF at 1839. (DeGennaro, NY) 1621 in FF. (Charlton, ON)

GERMANY—Deutsche Welle, **5910** in RR at 0525, **9815** via Sri Lanka in EE at 2350 and **15145** via Russia at 0130. (MacKenzie, CA) **6140** in EE at 0805, **9655** via Sri Lanka in unid language at 1159 and **13780** via Sri Lanka to Africa at 2136. (DeGennaro, NY) **6145** in GG at 0250 and **9790** in GG at 1530. (Newbury, NE) **9545** in GG at 0048, **9720** via Sri Lanka in GG at 2204, **11865** in EE at 2150, **17595** in EE at 1620, **17860** via Rwanda in GG at 1930. (Charlton, ON) **6190** in GG at 0000 and **9615** with EE to Africa at 2115. (Linonis, PA) Hamberger Lokalradio via Julich, **6045** from 1000 sign on with brief music, man with ID and opening anmts, long talks in GG by several people, several IDs at 1007. (D'Angelo, PA) Deutschland Radio, **6005** with news in GG at 2205. (DeGennaro, NY) Adventist World Radio (via), **15175** in AA at 1930. (Brossell, WI)

GHANA—GBC, **4915** with EE sign on at 2159 and into news. (DeGennaro, NY) 2300 with news, African music. (Linonis, PA)

GREECE—Voice of Greece, **5865** at 0010, **7475** at 0320, **9375** with call-ins at 2324; **9420** at 2334, **12105** at 2246, **17565** via Greenville at 2022, all frequencies in Greek. (DeGennaro, NY) 5865 in Greek at 0520. (MacKenzie, CA) 9420 in Greek at 2252, **15630/17705** in Greek at 1625. (Charlton, ON) 15630 in Greek at 2015. (Brossell, WI) Filia Radio (domestic 666 AM and 107 FM) via Voice of Greece on **7430** at 1929 open with news. Mentions also to Europe and America on shortwave. (D'Angelo, PA)

GUAM—Adventist World Radio, **17880** in CC at 2343. (MacKenzie, CA) Trans World Radio, **9430** in unid Asian language at 1150. (Brossell, WI)

GUATEMALA—Radio Cultural, Coatan, **4780** in SS with ID at 1100, religious programming. (DeGennaro, NY) 1145. (Brossell, WI) 0215 to 0233 close. (Alexander, PA) Radio Buenas Nuevas, San Sebastian, **4799.8** with music, ID and SS talk from 1133. (DeGennaro, NY) 0245 with local religious music, lots of dead air between selections. (Alexander, PA) Radio Verdad, **4052.5** in SS at 0320. (Brossell, WI) 0450 with continuous religious vocals, SS ID, then in EE as "Radio Truth," more music. (D'Angelo, PA)

GUINEA—RTV Guineenne, **7125** in unid language at 2055. (DeGennaro, NY) (usually in FF—gld)

GUYANA—Voice of Guyana, **3291** with EE rugby match at 0547, sports scores and BBC programming. (DeGennaro, NY)

HAWAII—WWVH, **5000** with time signal anmt by woman at 1255. (Newbury, NE)

HONDURAS—HRMI-Radio Misiones, Tegucigalpa, **3340** heard at 0235 with religious music, SS talks, closing anmts at 0506. (Alexander, PA)

HUNGARY—Radio Budapest, **6025** in GG at 2057 and **9825** in HH at 2224. (DeGennaro, NY) **9570** in HH at 0218 and **11830** in HH at 2143. (Charlton, ON)

ICELAND—AFN/AFRTS, 9980u with religious service heard at 1308. (Brossell, WI)

INDIA—All India Radio, **4760**-Port Blair, 1145 with Hindi (HH) talks, vocals and flutes; **4775**-Imphal, 1149 with HH talks, and vocal, ID and news at 1200; **4800**-Hyderabad, 0124 with long HH talk and flutes; **4840**-Mumbai at 0003 with HH vocals and instrumentals hosted by a woman. 3 + 1 time pips and news in Hindi, //**5010**; **4895**-Kurseong at 1146 with continuous vocals until news at 1230, //**4850**; 5010-Thiruvananthapuram at 0030 with news in HH, ID and news in EE; **9445**-Bangalore ending EE news at 2208, ID and commentary. (All D'Angelo, PA) 4840-Mumbai at 1251. (Strawman, IA) **4860**-Delhi in presumed Hindi at 1257. Also **15050**-Delhi in presumed Hindi at 1157. (Brossell, WI) **7115**-Panaji, to Middle East and Africa at 1600. (Paradis, ME) 9445-Bangalore at 1900 in presumed Hindi with sitar, vocals. (Linonis, PA) 2157 with EE. (Charlton, ON) 2118 in EE to Europe with listener letters, **9470**-Aligarh in Hindi to Southeast Asia at 2203, **9950**-Delhi with EE news at 2210, **10330**-Bangalore in HH to South Asia at 1145, **11585**-Bangalore in HH to Western Asia at 1554, **11620**-Delhi in Hindi at 1028 and **13710**-Bangalore in Hindi to East Asia/Australia at 1122. (DeGennaro, NY) **9690**-Bangalore, with EE ID at 1400, //13710. (Newbury, NE) 9950-Delhi in EE at 2140. (Charlton, ON)

INDONESIA—RRI-FakFak, **4790** at 1245 to past 1300 with Koran recitations. Strong voice UTE QRM from "Alpha Alpha Romeo 7." (Brossell, WI) RRI-Makassar, **4750** at 2141 with man/woman aners in II talks, musical selection, SCI and Jakarta news relay at 2200. (D'Angelo, PA) Voice of Indonesia, **15149.9** heard at 2003 with news by woman, political commentary, music. (D'Angelo, PA)

IRAN—VOIRI, **6055** with AA talks at 2125, **11740** in AA to Middle East and North Africa at 1942. (DeGennaro, NY) **6120** "Voice of Justice" program to North America at 0138 with talk about U.S. in Iraq, postal and e-mail address for reports. Announced sked as 0130-0230 on 6120 and **9580**. Thanks D'Angelo for the tip. And VOIRI-7320 with national anthem at 1930 sign on, Koran, EE religious messages at 1935, news at 1937, off at 2028. (Alexander, PA) 6120 at 0205 with lots of coverage of Iraq and feature program "Iraq Occupation Crisis." Many IDs. //9580. (D'Angelo, PA) **9855** in AA at 2340. (MacKenzie, CA) **9905** in AA at 0034. (Charlton, ON)



This TWR QSL confirmed D'Angelo's reception of its broadcast via Albania.

ISRAEL—Kol Israel, **6280** in Hebrew (HH) at 2233, **7545** in HH at 0329. Also **15640** in SS to Europe and North America at 1650. (DeGennaro, NY) **9390** in HH at 2250, **11585** in HH at 1955 and 0154. (Brossell, WI) **9435//17535** in SS at 1713, **11605** in EE at 1908 and **15640//17535** in HH at 1948. (Charlton, ON) Galei Zahal, **6973** in HH at 0205. (Taylor, WI) 0300 in HH to 0402 sign off. (Alexander, PA) 2038 in HH. (DeGennaro, NY)

ITALY—RAI Int., **6010** in SS to Europe and N. Africa at 2116, **6125** in unid Slavic language to Europe at 2207, **11800** in II to North America at 2315 and **11920** via Singapore in II to Australasia at 1044. (DeGennaro, NY) 11800 in II with IS and EE ID at 0115, **11880** at 2043 with birdcall IS, bells, music, woman in presumed II; **21520** in II at 1627. (Charlton, ON) IRRS, **5775** at 2215 carrying "Free Speech Radio News," IRRS ID and into "UN Radio." Off abruptly at 2300. Also **13840** at 0840 with U.. pops, EE IDs at 0858 and 0903, otherwise just constant U.S. pops. (Alexander, PA)

JAPAN—Radio Japan/NHK, **6110** via Canada at 0548 and **17810** in CC at 2350. (MacKenzie, CA) **6120** via Canada in EE at 1158, **11710** via England in GG at 1125, **15355** via Gabon in JJ at 1834 and **17825** (direct) in JJ at 2236. (DeGennaro, NY) **6180** via England at 2120 and **15220** via Ascension in JJ at 2219. (Brossell, WI) **9505** at 1505 and **11840** via Sri Lanka at 1502. (Newbury, NE) **21600** via French Guiana in JJ at 1711. (Charlton, ON)

JORDAN—Radio Jordan, **6105** in AA at 2219, **9830** in AA at 1906 and **11690** in EE to Europe at 1602. (DeGennaro, NY) **9635** in AA at 1944; **9830** in AA at 2043 and 11690 in EE at 1652. (Charlton, ON) 11690 at 1655. (Newbury, NE) **15290** with apparent news at 1208. (Brossell, WI)

KAZAKHSTAN—Deutsche Welle (via), **9395** in GG at 1207. (Brossell, WI)

KUWAIT—Radio Kuwait, **9855** in AA at 2335 and **15505** in AA at 2037. (Charlton, ON) **11675** in AA at 0245. (Newbury, NE) **15110** in AA at 1310. (Northrup, MO)

LAOS—Lao National Radio, **6130** at 1156 with vocals, until seven gongs, instl. music to woman with news in Lao. (D'Angelo, PA) 1200 with gongs. Weak but easily copied under huge open carrier. (Strawman, IA)

LIBYA—Radio Jamahiriya, **11635** in AA at 2105. (DeGennaro, NY) **15205** at 1930. (Brossell, WI) **15560** at 1627, **21675//21695** at 1327. (Charlton, ON) (All frequencies are via France, all in AA.—*gl'd*)

LITHUANIA—Radio Vilnius, **7325** in Lithuanian to North America at 0101. (DeGennaro, NY)

MADAGASCAR—Radio Netherland Relay, **7120** heard at 1830. (Paradis, ME)

MALI—RTV Malienne, **4783//4835** with hi-life music and FF talk at 2140. (Brossell, WI) **4785** in FF at 2244. (DeGennaro, NY)

MAURITANIA—Radio Mauritanie, **4845** in AA at 2100. (Paradis, ME) 2143 with Koran, AA talks. Also noted at 0255. (Brossell, WI) 2245 with Koran. (Linonis, PA) 2355. (DeGennaro, NY)

MEXICO—Radio Educacion, **6185** at 0550 in SS with music, SS talk and IDs. (Wood, TN) 1105 with instl and classical music. (DeGennaro, NY) XERTA-Radio Transcontinental, **4810** at 0151 with SS pops, ID by man at 0200, more pops. Religious talks at 0230. (D'Angelo, PA) 0545 with SS pops. (Newbury, NE)

MOROCCO—Radio Medi-Un, **9575** in AA at 0000. (Charlton, ON) 2141 with music and FF talks. (DeGennaro, NY) VOA Relay, **11720** in FF at 1950. (Charlton, ON) **17895** at 1845. (Newbury, NE) RTV Marocaine, **15345** in AA at 1830, mentions of Allah. (Wood, TN) 1825 in AA. (DeGennaro, NY) 1936. (Brossell, WI) 1937. (Charlton, ON) 2100. (Jeffery, NY)

NEW ZEALAND—Radio New Zealand Int., **9870** with sports news and interviews at 1335. (Newbury, NE) 1123 with report on HIV in Papua New Guinea. (Foss, Philippines) 1050 on avant-guard music. (DeGennaro, NY) **17675** to Pacific at 2300. (Linonis, PA)

NETHERLANDS—Radio Netherland, **9590** via Madagascar with Indonesian at 2200, **9895** in DD at 1129 and **17875** via Canada monitored at 1900. (DeGennaro, NY) **9845** at 0009. Also **11655//17810** at 1912. (Charlton, ON)

NETHERLANDS ANTILLES—Radio Netherland Relay **15315** in DD at 2100 with times and frequencies. (Charlton, ON) **17725** at 2030 with ID, news. (DeGennaro, NY)

NIGER—La Voix du Sahel, **7155** in FF with songs at 2110. (DeGennaro, NY)

NIGERIA—Voice of Nigeria, **7255** at 2233 with presumed news in unid language. (DeGennaro, NY) **9690** at 1925 with local pop program in EE, news magazine at 2000. (Alexander, PA) **15120** in unid language at 1315. (Northrup, MO) **17800** at 1915; Africa has done little to stop war in Sudan. (Charlton, ON)

NORTH KOREA—Voice of Korea, **11710** on U.S. nuclear policy at 1515. (Newbury, NE) **11735** at 0115 with talk on Kim Jung Il. (Linonis, PA) 15180 with woman anncr in EE, classical piano music. (MacKenzie, CA) Pyongyang Broadcasting Station, **6250** with military music at 1214. (Brossell, WI) **6398.8**-Kanggye at 1034 with long KK talks, //6250. (D'Angelo, PA) KCBS, **2850** in KK with patriotic vocals at 1140. (Strawman, IA)

NORTHERN MARIANAS—KFBS, **9465** in RR with religious talks at 1411. (Taylor, WI)

PAPUA NEW GUINEA—NBC, Port Moresby, **4890** in EE and Pidgin at 1231. (DeGennaro, NY)

PERU—(All in SS) Radio Frecuencia VH, Celendin, **4486** at 0145 with OA music, anmts, IDs. (Alexander, PA) Reina de la Selva, Chachapoyas, **5486.7** at 1010 with man hosting huaynos, TC, ID. (D'Angelo, PA) La Voz de la Selva, Iquitos, **4824.4** at 0950 with OA music, talks, IDs, TCs. (D'Angelo, PA) Radiodifusora Huancabamba, **6536** at 0115 with OA music, talk, IDs, promos. Off at 0217. (Alexander, PA) 0153 with long talk segments, phone calls, OA vocals. Off at 0223. (D'Angelo, PA) Radio Horizonte, Chachapoyas, **5019.9** at 1015 with rooster crows, anmts, promos, lively OA music. (Alexander, PA) 1021 with morning OA music pgm. (D'Angelo, PA) Radio Oriente, Yurimaguas, **6188** with commercials and music at 1035. (DeGennaro, NY) Radio La Hora, Cusco, **4855.8** at 1010 with OA music, ID, talk. Drifting upward slightly. (Alexander, PA) Radio Santa Monica, Cusco, **4965** at 0955 with OA music, canned IDs, talks. (Alexander, PA) 0956 with man in excited talk, flutes, woman with ID. (D'Angelo, PA) Radio Imperio, **4386.5** at 0910 with man shouting, ID, TC. (D'Angelo, PA) La Voz del Campesino, Huamaca, **6957** at 0135 with man hosting OA vocals. Off at 0152. (D'Angelo, PA) Radio Huanta 2000, Huanta, **4747** at 1010 with music and talk. (DeGennaro, NY) 0041 with man hosting OA vocals. (D'Angelo, PA) Radio Tarma, Tarma, **4775** at 0118 with flutes, man host, canned, formal ID, woman in long talk. (D'Angelo, PA) 1017 with ID, TC, music. (DeGennaro, NY) Radio Paucartambo, **6520.3** at 0945. (Wilkner, FL) 1003 with rustic vocal, talk, brief news, ID, TC, and OA vocals. (D'Angelo, PA) Radio Altura, Cerro de Pasco, **5014.6** at 1019 with SS talk, ID, campo music, TCs, ad strings, and jingles. (Alexander, PA) 1021 SS talks and anmts, OA vocals. (D'Angelo,

PA) Radio Cultural Amauta, Huanta, **4955** with talks at 1045. (DeGennaro, NY)

PHILIPPINES—FEBC, **9405** in CC at 2331. (DeGennaro, NY) 9435 at 2230 sign on in possible Tagalog or Malay. (Linonis, PA) **15435** in unid language at 0100. (MacKenzie, CA) Radio Veritas Asia, **15520** in Tamil at 0055. (MacKenzie, CA) VOA Relay, **6110** with news at 1200. (Brossell, WI) 9760 with news at 1303. (Newbury, NE) **11705** with "Asia News Now" at 1300. (Paradis, ME) **15395** in CC at 0107. (MacKenzie, CA)

PIRATES—Crystal Ship, **4070** at 0130 with ID and song. Heavy noise. (Wood, TN) Take It Easy Radio, **6925 USB** at 0119 with Eagles, talk about pirate radio, encouraging reports to FRW, FRN, ACE. Merlin address for reports. (Zeller, OH) Sunshine Radio, **4065 USB** at 0038 with ID, songs by various groups. (Wood, OH) Undercover Radio, **6920** at 2320 with ID, and undercoverradio@mail.com e-mail address. (D'Angelo, PA) Grass Cutter Radio, **4065 USB** at 0104 sign on with ID a couple of songs and off at 0114. (Wood, TN) Mystery Radio (Europirate) **6220** at 0100 with continuous Euro-pops, U.S. pops mostly from '70s and '80s. Still there at 0750 recheck. (Alexander, PA) WJAM Punk Rock Shortwave, **6925** at 2234 with host "Zach Riot" and punk rock sounds and news. (D'Angelo, PA) WHYP, **6925** with the usual mix of barnyard noises, Bozo remarks, and similar WHYP audio clips mixed in with the regular show. Noted on various dates at 0035 sign on, 2156 sign on and 2324. (Zeller, OH) **6952.6** at 2326 with humorous ad for "DX Survivor" program noted celebrating eight years of broadcasting. (D'Angelo, PA) Smooth Blues Radio, **6925 USB** at 0400 with rock and blues, some talk by guy, handful of definite IDs. Appeared to claim a Mississippi location. (Zeller, OH) Voice of Laryngitis, **6925.6** at 0029, apparently a combination of a new production and a relay of an old show. Including numbers read in SS mixed with the trademark barking seal IS from Laryngitis. After 0034 it was a relay of the classic "pirate busters" sketch from Laryngitis with siren and machine gun sound effects. Their old Battle Creek address is no longer valid. (Zeller, OH) WHGW, **6925 USB** at 2205 just a brief program of instl music and ID at 2208 sign off. I understand they use whgw@myway.com for reports. Also noted at 2032 with lengthy comedy sketch (Zeller, OH) WMPR, **6955** at 0010 with techno mx. ID as "W-M-P-R-6-9-5-5." (Zeller-OH)

PORTUGAL—RDP Int., **9715** at 0141, **9815** at 1056, **17680** at 1832 And **21830** at 1115, all in PP. (DeGennaro, NY) **21655** in PP at 1715. (Charlton, ON)

ROMANIA—Radio Romania Int., **6055** in FF at 2102, **6140** in EE at 0130, **7105** in GG at 2004, **9525** in SS at 0027 and **9690** in EE at 2015. (DeGennaro, NY) **7285** in presumed Romanian at 2130. (Brossell, WI) **9610** in EE monitored at 2333 and 9690 at 0116 "You are tuned to Bucharest Romania Radio." (Charlton, ON)

RUSSIA—Voice of Russia, **5945** from in SS at 0219, **6190** in SS at 0139, **7180** via Moldova in EE at 0415, **7330** in SS at 0123, **7390** in PP to Brazil at 0051 and **7440** in RR to South America at 0040. (DeGennaro, NY) **9920** in RR at 1319. (Brossell, WI) **11630** in RR at 1820. (Linonis, PA) **15595** in EE at 0230. (Newbury, NE) Radio Rossii, **6075** in RR at 0540. (MacKenzie, CA) 1250. (Brossell, WI)

RWANDA—Radio Rwanda, **6055** in FF after Turkey closes at 2019. FF pops & some U.S. country. (Alexander, PA) Deutsche Welle Relay, **15410** in EE at 2103. (Newbury, NE) **17860** in GG heard at 2144. (Charlton, ON) 2151. (DeGennaro, NY)

SAO TOME—VOA Relay, **4940** to 2101 close with D.C. address for program schedule and **4960** at 0334, //9885. Also **9785** from 0327 sign on. (D'Angelo, PA) **6080** at 0544 and 7290 at 0436. (MacKenzie, CA) **11975** at 2000. (Paradis, ME) 2004. (Brossell, WI)

SAUDI ARABIA—BSKSA, **11820** in AA with Call to Prayer and Koran at 2003. (DeGennaro, NY) 2039. (Charlton, ON) **11950** in AA to Asia at 1900. (Paradis, ME) **15380** with Koran at 1216. (Brossell, WI)

SEYCHELLES—BBC Relay, **9605** to West Africa at 2204. (DeGennaro, NY) **17830** with a drama heard at 2146. (Charlton, ON)

SERBIA-MONTENEGRO—Int. Radio of Serbia Montenegro, **9580** at 0005 "International Radio of Serbia Montenegro is giving you the news." (Charlton, ON)

SIERRA LEONE—Radio UNAMSIL (t) **6137** at 0130 with talk about UN efforts in Sudan. (Linonis, PA)

SINGAPORE—BBC Relay, **9740** at 1210. (DeGennaro, NY) 1440. (Northrup, MO) **17790** at 0003. (MacKenzie, CA)

SLOVAKIA—Radio Slovakia Int., **9440** at 0115. (DeGennaro, NY) 0126 with IS and frequencies, ID at 0130. (Charlton, ON)

SOUTH AFRICA—Channel Africa, **3345** at 0313 with cricket and other sports news. (D'Angelo, PA) 0315 with U.S. pops. (Brossell, WI) **7390** with music variety. Also **15285** with sports news at 1701. (DeGennaro, NY) **15265** with news items in EE at 1719, 15285 in FF at 1643 and **17770** in EE at 1533. (Charlton, ON) Adventist World Radio (via),

11845 with multi-lingual ID, including "This is Adventist World Radio—The Voice of Hope." IS at 2000 and into FF. (Brossell, WI) **15295** at 2046 and **15365** in unid language at 1935. (Jeffery, NY) 15365 in listed Igbo language at 1939. (Charlton, ON) Trans World Radio (via) **11640** with ID, IS at 0600. (Newbury, NE) BBC, **7205** in FF at 0445. (MacKenzie, CA) Radio Sondergrense, 3320 with music and commls in Afrikaans at 0314. (Brossell, WI) 2115. (DeGennaro, NY)

SOUTH KOREA—Radio Korea Int., **9560** via Canada at 0211. (Charlton, ON) **11795** via Canada in SS at 1109. (DeGennaro, NY) **15575** in JJ at 0040. (MacKenzie, CA)

SPAIN—Radio Exterior de Espana, **6055** in EE at 0006, **7270** in AA at 2125, **9535** in SS at 2339, **9620** in SS at 0058, **9630** in SS at 2209, **12035** in FF at 1911, **13720** in SS at 1127 and **17595** in SS at 1825. (DeGennaro, NY) 6055 in SS at 0535. (MacKenzie, CA) 9535 in SS at 0045, **9570** in EE at 2008, **15130** in SS at 2104, **17580//17850** in FF at 1900, **21570** in SS at 1614 and **21610** in AA at 1713. (Charlton, ON) **15170** in SS at 1330. (Northrup, MO) 17595 in SS at 1709. (Newbury, NE)

SRILANKA—VOA Relay, **9645** at 1502. (D'Angelo, PA) **9890** with news at 2336. (MacKenzie, CA)

SUDAN—Radio Peace, **4750** at 0230 sign on with ID, anmts, long talk by woman in EE. (D'Angelo, PA)

SWAZILAND—Trans World Radio, **3240** with choral singing at 0340, closing anmts in listed Nda. Off at 0345 but carrier on until 0347. **4775** at 0338 sign on with music box IS, man with EE ID prior to opening ID and anmts in listed Lomwe language. (D'Angelo, PA)

SWEDEN—Radio Sweden, **13840** in Swedish at 1650 and **15240** via Canada in Swedish at 1650. (DeGennaro, NY) 15240 in Swedish at 1205. (Brossell, WI) 1305. (Northrup, MO) 1343 in Swedish. (Charlton, ON) 1658 in Swedish. (Newbury, NE) IBRA Radio via Germany, **9605** with religious talks in AA at 2014. (DeGennaro, NY)

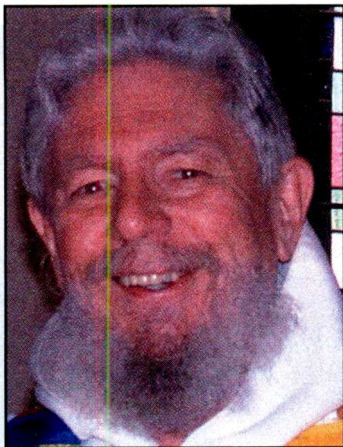
SYRIA—Radio Damascus, **12085** in AA at 2034. (Charlton, ON)

TAIWAN—Radio Taiwan Int., **7130** in JJ at 1309. (Newbury, NE) **11825** via USA at

This Month's Book Winner

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

Our book winner this month is **Ray Paradis**, Pittsfield, Maine, who receives a copy of Joe Carr's *Receiving Antenna Handbook*, courtesy of our friends at Universal Radio. Treat yourself to a free copy of their giant radio hobby catalog by contacting them via e-mail at dx@universal-radio.com, by phone at 614-866-4267, or by mail at 6830 Americana Parkway, Reynoldsburg, OH 43068.



Here's reporter Ed Newbury of Kimball, Nebraska. We don't see his rig but he's smiling so he must know where it is. Thanks, Ed!

0102 and **15600** via USA at 2247. (Charlton, ON) **15265** via Tinian in Hindi at 1434. (DeGennaro, NY)

THAILAND—Radio Thailand, **5890** (via Greenville—gld) // **9570** with schedule anmts at 0034. (Charlton, ON) **7285** in presumed Thai at 1042, **7305** at 1100 with EE ID and into Thai and **9535** in GG at 2000. (DeGennaro, NY) **9810** at 1247 with economic news. (Strawman, IA) 1257 with "This is HSK9, Radio Thailand World Service broadcasting from Bangkok," then IS, ID again and news. (Brossell, WI) BBC Relay, **6195** at 2123 with report on casinos. (Brossell, WI) **15155** at 1335, // **15190**. (Northrup, MO) **17615** with ID and "Teachers Around the Globe." At 0030, // **15280**. (MacKenzie, CA) VOA Relay, **9770** in Mandarin at 1407. (Charlton, ON)

TURKEY—Voice of Turkey, **5980** with talk, traditional music. (Paradis, ME) **7300** in TT at 2345. (Newbury, NE) 7300 at 2238 and **9525** in EE at 2125. (DeGennaro, NY) **9830** at 2210, **15350** in TT at 1507. (Charlton, ON)

TUNISIA—RTV Tunisienne, **7190** in AA at 2227 and **7225** in AA at 2120. (DeGennaro, NY) **9720** in AA at 1949. (Charlton, ON) **12005** in AA at 1800. (Wood, TN) 1830 in AA. (Paradis, ME)

UGANDA—Radio Uganda, **4976** at 2043 with soft vocals, ID, and apparent closedown anmts heard at 2059. (D'Angelo, PA)

UKRAINE—Radio Ukraine Int., **5840** with EE news heard at 2204. (DeGennaro, NY)

UNITED ARAB EMIRATES—Adventist World Radio (via) **15395** in Mandarin at 1420. Off at 1500. (D'Angelo, PA) **17595** at 1800 with Christian programming in AA. (Linonis, PA) Emirates Radio, Dubai, **15435** in AA at 1547. (Charlton, ON) Deutsche Welle (via), **21820** in AA at 1200. (Paradis, ME)

USA—AFN/AFRTS Key West, **5446.5 USB** at 1225. (DeGennaro, NY) **7811** at 0117. (Taylor, WI) KOA, Denver, **25950** cue link frequency with live sports coverage at 1835.

Thanks to Tom Williamson for the tip. (D'Angelo, PA) (This and similar operations in this area are only periodically active and use very low power.—gld) WWRB, **5015** at 0150; a spur from **5085**. Another one on **5120** from 0050. (Alexander, PA) **5015** (from 5085) at 0256. (Taylor, WI) (Might be a good idea to alert the station in cases like this.—gld) KJES, **11715** with the usual readings and responses by children at 1510. Back after transmitter repairs. (Barton, AZ)

UZBEKISTAN—Radio Tashkent, **9715** in UU at 0109. (Charlton, ON) 1258 opening and into Hindi, IS at 1330 and start of EE. (D'Angelo, PA) 1345. Woman anncr refers to station as "RTI." (Barton, AZ) BBC (via), **9865** in unid language at 1330. (Brossell, WI)

VATICAN—Vatican Radio, **5885** in II at 2023, **9605** in PP at 0044, **9645** in II at 1125 and **15570** in FF at 1723. (DeGennaro, NY) 9605 in FF heard at 0233, // 9605. (Newbury, NE) **11625** with EE translation of Pope's speech. (Charlton, ON)

VENEZUELA—YVTO, **5000** with SS time signal anmts under WWV at 0947. (DeGennaro, NY) Radio Amazonas, Puerto Ayacucho, **4939.7** with SS songs and commls at 1048. (DeGennaro, NY) Radio Nacional, **11760** in SS at 2353, **17705** in SS at 2049 (Charlton, ON) **13680** at 2004. (DeGennaro, NY) 2315. (Barton, AZ) **15230** heard at 2012. (Jeffery, NY) (All in SS and all via RHC transmitters in Cuba—gld)

VIETNAM—Voice of Vietnam, **6175** via Canada at 0121. (Charlton, ON) 0239. (DeGennaro, NY)

ZAMBIA—Christian Voice, **4965** at 0335 with Christian rap and short religious talks, EE ID and UK postal address. Carrier cut at 0357. (D'Angelo, PA) 0340 to 0404 close. Many "The Voice" IDs. Asked for reports. (Alexander, PA) 2310. (DeGennaro, NY) ZNBC/Radio Zambia, **3306** (p) at 0320 with local Afro-pops, vern. talk. Also **4910** at 0245 sign on with Fish Eagle IS, choral anthem. (Alexander, PA) 0308 with vernacular talks and call-ins. (Brossell, WI) 2131 with call-in program. (DeGennaro, NY)

Time to hoist the banners and sound a fanfare in salute to those who stepped forward this time, namely: Jerry Strawman, Des Moines, IA; George Zeller, Cleveland, OH; Robert Charlton, Windsor, ON; Stewart MacKenzie, Huntington Beach, CA; Joe Wood, Venore, TN; Ed Newbury, Kimball, NE; Rick Barton, Phoenix, AZ; Rich D'Angelo, Wyomissing, PA (& French Creek State Park DXpedition); Ray Paradis, Pittsfield, ME; Jack Linonis, Hermitage, PA; Mark Northrup, Gladstone, MO; Robert Brossell, Pewaukee, WI and Cero DeGennaro, Feura Bush, NY. Thanks to each and every one of you.

Until next month, good listening! ■

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The NCS-3230 Multi RX Audio Controller, And Organizing Your Scanning Activity

How many radios can you listen to at once? I remember my mother, and then also my wife, asking that question several times over the years. Well, it turns out the answer is quite a few, and a new gadget from New Communications Solutions (www.ncsradio.com), the NCS-3230 Multi RX controller, helps quite a bit.

It's always hard to focus on what you want to hear when a bunch of radios all start chattering at once. Yet when it's quiet, you often can have several radios on at the same time without thinking about it (assuming you have them handy; see my rationale for such strange behavior below). Balancing with volume levels and position helps a lot, but it's always been more of an art than a science. No more.

The NCS-3230 allows up to six receivers to be connected at the same time. Two speakers also need to be hooked up and then you're in business. Just being able to switch audio from six devices to two speakers is very cool and quite useful all by itself, but that's just the beginning with this unit. In Normal mode, you can position any of the six receivers left, right, or center using front-panel controls that are very easy to operate once you get the hang of what they're doing. You can also select any combination of the receivers for recording to a digital or analog recorder by VOX or manual operation.

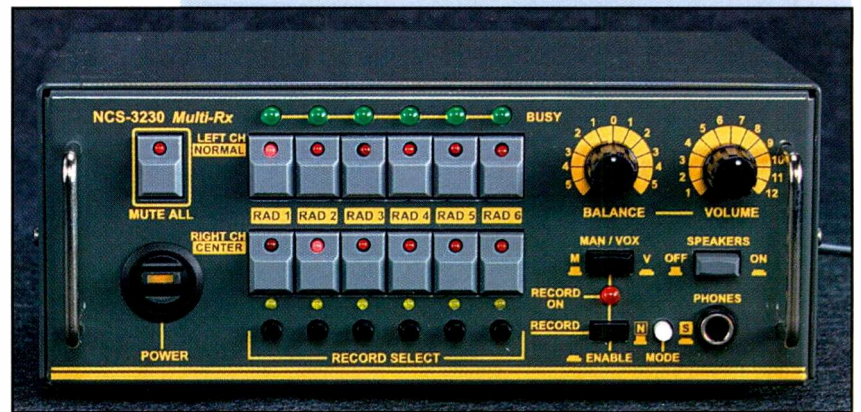
Spatial Mode Makes A Real Difference!

The Spatial mode is where the unit begins to make a real difference. In that mode each of the six receivers has a pre-assigned location in the "audio field" ranging from far left to far right; 1-3 are left and 4-6 are right. Of course, you'll need some distance between speakers to hear this, but what a difference it can make! Pushing the bottom-row button instantly "centers" the audio from that radio and boosts its audio so that signal can be concentrated on. Another push puts everything back to normal. Very nice.

This is an accessory for base operation only. It requires 11-14 Vdc of power. The expectation is that the unit will be used in ham or base receiver applications where a 12V power supply is almost standard equipment. At a price point of \$349.95, this is a major accessory. However, if you have even a couple of receivers, it can make a real difference in your listening.

Sweet Speaker!

To go with the NCS-3230 Multi-RX controller, you might consider a pair of "Sounds Sweet" speakers (www.soundssweet.com). These are not compromise speakers and are optimized for communications use. They are large (10" x 12" and 10 inches deep) and built like a tank. A solid-wood, black cabinet gives them both a heavy feel and solid sound. Even with a single radio, you'll find the audio improves with this speak-



The NCS-3230 Multi RX audio controller from New Communications Systems is a very nice accessory for controlling the sound in a multi-radio environment. Not only can audio be switched in and out, stereo separation is used to create an "Audio Field" for up to six receivers, making listening to multiple radios much easier if they're busy.

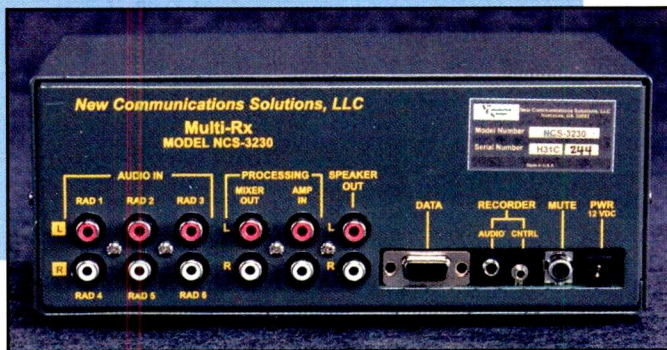
er. Don't hook them to your stereo, though. These speakers are focused just on the audio range for communications; there's no tinny tweeter here! At \$99 each, this could be the last speaker you will ever need for communications.

Why would you want more than one receiver? One reason, of course, is for extra capabilities. Most people who have multiple radios didn't buy them all at once, but rather accumulated them over several years of listening. As new radios came out with capabilities or frequency ranges that weren't previously available, a new one was added to the collection. But since the used market often doesn't make it worthwhile to dispose of the old radio, it finds another use somewhere in the shack. A good example of adding a new radio because of its capabilities is the trunktacker radios of recent years. If you live near a trunking system those radios can follow, you'll want one regardless of the equipment that you already have.

The other reason why you would want more than one receiver is to get more banks. As you begin to listen more, you start to focus on things that are of greater interest. You also begin to learn what frequencies are active at what times. Many frequencies are only of interest when something major is happening, and the rest of the time the traffic is of little interest. In many cases, being able to switch in a bank quickly (and without having to stop and reprogram a radio) makes all the difference in hearing the early action.

Banks Of Banks

If you think about it for a minute, banks are really the "channels" of your scanner. Bear with me for a second, and forget



The rear panel of the NCS-3230 has standard RCA connectors, which are not the connector of choice for most scanners. However, they do hold up well over time, and cables and adapters are easy to find. There's also recorder connections, and optional amplifier in and out for adding an additional amplifier or DSP processing into the mix as well. What a way to listen to HF utility stations on SSB!

about channels in the "200-channel scanner" sense. I'm thinking more like TV channels, programs you want to listen to on your scanner—groupings of things that make some sense to monitor together because they have something in common.

With multiple radios you have multiple groups of banks. If one of your radios is old enough to still need crystals, then that "bank" is pretty much fixed and can't be reprogrammed easily. For most of us, however, the programmable scanner means that we can easily move frequencies around, and pretty much at will. If you've ever reprogrammed a 500-channel scanner, you know that it takes a lot of will and patience. Switching a bank on and off can be done rapidly—much more rapidly than locating a particular frequency and locking it out (on most scanners anyway). It's also easy to tell which banks are turned on or off. Making use of this "grouping" function allows you to get much more mileage, and ultimately information, from your scanner.

Service Or Geography?

Most of the methods of organizing your scanner's frequencies that I have seen come down to separating the channels by the type of service that uses them—police, fire, medical, ham, etc.—or by area (all of the south stuff in one bank, north in another, and so on). Quite frankly, I hadn't really given it a whole lot of thought until I started messing with computer-control systems and it became possible to reorganize banks quickly and easily.

I had always been pretty much a service fan, putting all of the county police channels in one bank, city in another, state and outlying areas in another. Then there was a bank for fire, but I depended on the radio with regard to how much room I had to put together any other services. This method works quite well if you're interested in a particular department or section of scanning, or if you seldom listen to a particular service but want to have the channel of interest handy for when something does happen (assuming, of course, that you have open banks to store them in). This method also works well for scanning from a fixed location—home, for instance.

The primary *disadvantage* of this method comes to light when you get into a busy environment. If you have a busy police department with several channels, it's entirely possible that your scanner can be held up for quite some time, plowing its way

through, stopping here and there as it goes. Perhaps some of the channels are not of much interest, but if they are grouped together by service, you'll probably have them active. It's entirely possible that you'll get tied up with some major event in the police bank and miss some other event in another bank. Of course, there's no total cure for this, but you can mitigate the damages a bit by planning.

Having another radio doesn't hurt either. Eventually, if there's enough traffic, you'll either have to give up listening to some channels or add another radio just to have the chance of hearing what's happening. Often, if a second radio is available, it can be parked on a single channel where the main action is happening while the other radio scans. You can pick up a lot of detail in a hurry this way, if you pick the right channel to park on.

Geographically Speaking

The other popular method of organizing is by area, with all of the south-side stuff in one bank and all of the north side in another. This probably means that some channels will have to be duplicated, such as mutual aid and point-to-point channels that are in use no matter where you are. Things such as fire dispatch and medical services also may not follow clean geographic lines and will have to be duplicated as well. It seems like a waste of channels, don't you think?

Well, back in the old days of 4- and 16-channel scanners I would have agreed. Of course, most of the 4- and 16-channel radios didn't have banks anyway, so the point was moot. However, with today's 200-, 400-, and even 1000-channel radios some duplication starts to be a little more tolerable and even make some sense at times.

Another case in point: Our county is divided into seven precincts. Most of the precincts have their own dispatch channel, although a couple of them are shared. A detective channel, a car-to-car channel, and an emergency channel are shared county wide. As I mentioned earlier, I used to keep all of the police channels in one bank and scan them all full time. The problem is that in the north precinct, you can't hear much of what's going on in the south one. It's simply too far away to get much but static. In addition, among the municipalities within the county (somewhere around 80), some have their own police departments and some do not. Some of the municipalities that have

Banks You Might Consider

Here are a few ideas to get you started. This list is by no means exhaustive.

Service: Police, Fire, Medical, Media, Aviation, Military, Ham, Business, Malls, Casinos, Unknown or Experimental, Schools, Railroads, Busses/Taxis

All-the-time stuff: Mutual Aid/Shared frequencies, Maritime, Lake, River

Geographic: City, County, Local, North, South, East, West, Out of State, Your City, Neighboring City, Precinct or District

Special Banks: Airport problems; Parade/Fair; Rail accident; major Vehicle accident; River/Lake/Ocean incident; Industrial incident; VIP visit; Jail or Prison incident; major Media event; Sports event; Severe Weather; Natural Disaster; major Fire, Riot, or other civil disturbance; Concert or Theater event; Special-use channels (emergency, detectives, traffic, etc.)

“There’s a balancing act between scanning too much so that you can’t really follow anything, and listening to only one channel so you follow all that traffic but miss everything else.”

nels that cover that area, and the shared channels I want to listen to most of the time. In addition, I created a bank for all fire and one for air stuff (when I’m near the airport at lunchtime), and one or two left over for experimental stuff or special events.

It works like a charm. I simply switch banks on and off like I used to use channels, but now I’m not missing all the action on other frequencies in the area. The trade-off is that there is a lot of duplication in my scanner, and there are several banks with very few channels in use. Oh well. Here again is a great excuse for an extra radio. I certainly wouldn’t want this arrangement at home, so a handheld for strictly mobile use makes sense (or a mobile scanner mounted in the car, but that’s another story). The point here is that this radio really isn’t a “multiple radio” system, because that radio is removed for a special use.

Event Scanning

A friend of mine is a nut for special events. Hmmm . . . come to think of it, even if he didn’t like special events, I’d be half right in that assessment. Anyway, he groups many of his scanner banks by event. He has a handful of channels that he likes to listen to all the time, and he dedicates one or two banks in one of his scanners to that, for the most part grouped by geography. He’s mostly interested in tracking local stuff. The rest of the banks in his radios are dedicated to one type or another of special-event scanning, some of which border on services.

There’s a bank for severe-weather events. Any time during the year when severe weather threatens, he flips on this bank and immediately has access to the highway department, weather-observation channels, ham radio frequencies that are used for storm spotting, etc.

You can make sort of a challenge out of this type of thinking. Consider an event that is likely to occur in your area. What would happen, say, if the President came to your town? OK, if you live in the District, this won’t be very challenging. However, if you live somewhere else, think about it. What kind of frequencies might be active for a VIP visit? Would the person receive Secret Service protection? Their comms are mostly encrypted, so you can’t listen to them, but activity on those channels might tip you off that something is about to happen.

Would your local police play a role? Sometimes they are used to provide traffic control and other assistance. What frequencies might they use? How about medical services, or fire? News coverage? You can fill up a bank pretty quickly with good monitoring possibilities.

Now depending on where you live, you might have to wait a long time to see just how good your guesses were. But once it happens, it can be quite a lot of fun and get you in on the action just a bit earlier. Particularly if you have more than one radio and can dedicate a bank to channels you don’t need very often, it can be quite a lot of fun to plan. Even if you can’t spare a bank, you can think about the frequencies and write them down somewhere. That way you’ll have the planning done if you hear something is happening and can reprogram quickly. You do have a list of the frequencies that normally are in your scanner, don’t you?



Of course you’d never use the NCS-3230 with just one receiver, but the PRO-2006 is shown to give an idea of size. This unit is about the size of a standard base scanner, or slightly larger.

their own departments also have their own dispatch, while others contract it out to other departments or even the county.

The county has an additional two channels dedicated just to these municipalities, one for north-side stuff and one for the west group. Therefore, in addition to listening to the county precinct you’re in, you also have to follow these municipal channels—and there may be a bunch. Finally, I came up with a bright idea: “Why not give each precinct a bank?” (I may be old, but I’m also slow.) It could include the precinct channel, any municipalities in that precinct I care to listen to, the fire dispatch chan-



Just two receivers are all it takes to start hearing the benefits. That’s a YAESU FRG-7700 (late ’70s) on the bottom. For those too young to remember it, it’s a shortwave general-coverage receiver. For you old timers, you’ll remember this receiver as one of the first with digital readout to hit the “general market” at a reasonably affordable price.



The Sounds Sweet speaker is large compared to the ICOM K-2, but the communications-optimized sound may be worth the space in your shack!

Another possibility is if a factory, school, or other major facility near you has a major "event." It could be a celebration of some sort, or it could be a disaster situation. With the recent rash of school violence, there are all sorts of possibilities. SWAT operations are occurring on a seemingly more frequent basis in many parts of the country. Do you know where to find your local special operations? Our county has a frequency set aside for these types of events, but once at the scene, they switch to an unpublished and unannounced channel. Since it's all low-power stuff, you won't hear much unless you're too close for comfort!

What frequencies would be in use? What outside agencies might be called in? If you are located within listening distance of any large facility, chances are they use radio during their day-to-day operations, most of which are probably very boring. However, if something happens, having those frequencies handy might get you information that you wouldn't have until the news at eleven. In the event of a major disaster such as a chemical spill, that could be very good information to have in advance. Hopefully, you'll never get to test your theory. It's fun to plan, though, and maybe there will be a smaller event or drill just for you to test things out.

Parking On A Frequency

Another use for multiple radios is parking them on a particular frequency as something catches your attention. By not scanning, of course, you'll hear a lot more of the activity and call-back traffic on that channel. Of course, you'll be missing everything else if you only have one radio. By having an extra radio to park on an interesting channel, you can hear a lot more of the action and perhaps know when to anticipate traffic on other channels.

By listening to the police car-to-car traffic from an accident scene, you'll learn that they may have requested the fire department. Switching that bank in another scanner might help you learn more as they dispatch and arrive at the scene. The more radios you have available for this process, the more you can track closely (as long as there isn't so much activity that you can't concentrate on anything!).

I know many enthusiasts have a dedicated "fire radio" that is normally programmed with only fire dispatch channels. The theory is that something on the fire channels is much more likely to be a major event than the other stuff we listen to most of the time.

Once an interesting event is dispatched, the fire radio could have banks to switch on for the local or fireground channels used by a particular department. This leaves your regular scanner free to listen to all the routine police, air, ambulance, drive-through window traffic, and other things that are interesting when nothing is happening. However, you won't miss the big fire because somebody was running a license plate, or ordering lunch.

Here's some good advice from the AOL Radio Listener's Conference: "Armadillo's first law: You can never have too many radios. At one time, having more radios meant more channels. At one time, more channels meant an extra 4, 8, or 16 channels, and every one was a precious (and expensive if you had to buy crystals) resource. That's simply not true in these days of multi-hundred-channel receivers that are so common."

Trunking Systems

Trunktracker radios have made the need for organization quite apparent. While many of the newer trunktracking receivers can, in fact, mix conventional and trunked banks into a single radio, it may not be at all practical. Large trunking systems are busy almost all the time, and even if you're only interested in a few select channels, there's a good chance you'll miss something



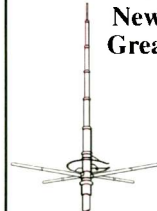
You don't need fancy equipment to begin to take advantage of many of the multi-radio techniques in this month's column. When you add a new radio, start thinking about how to use the old one in a new way!



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Frequency Of The Month

Oops. Last month I apparently suffered some kind of brain malfunction and managed to put old contact information at the end of the column and completely forgot to go back and plug in the frequency of the month. Sorry about that. If you sent anything, I didn't receive it at that old e-mail address (the mail address hasn't changed in years), so you'll need to resend it.

Thus, last month's frequency is **155.475**, and for this month we'll dip back down to the air band and have a look at **119.400**. Plug those in and let me know what you hear.

We also have a winner. **Dave Heard** from Kingswood, Texas wrote to say, "The frequency to check for December, 154.570, is MURS channel 4. Not much usage that I can hear in my area of Houston (Kingswood). Some references to a 'room 504 not being cleaned and a light bulb was still out.'"

Good job in spotting the MURS channel, Dave, and that's about the same activity that most folks heard, plus or minus. Thanks for sending in your entry.

that occurs while you're in the conventional scanning mode. Sure, it's possible to have both systems in one scanner, but my experience with even moderately used trunked systems dictates that two receivers is a much better option. You can, however, still group your ID lists together in banks, or scan lists as they're called, at least with most radios.

Most trunk-system listeners eventually settle on a group of IDs they like to listen to, and have another group that they don't want to hear at all. Using the ID list function allows you to group those IDs that you do want to listen to into logical "channels" or "virtual banks" in your scanner. By turning them on and off, depending on what's happening at the

time, you'll find your listening can have a lot more continuity. You'll hear the outcome of more stuff, and the follow-up calls will make sense to you. Even with a busy system, if you pick and choose your IDs carefully, it will increase your understanding of what you're hearing.

What Do You Use?

As you can see, there's no one right answer to the question of what to use. It depends a lot on the kind of events that you are likely to see in your area, as well as how much you want to listen to. There's a balancing act between scanning too much so that you can't really follow anything, and listening to only one channel so that you follow all that traffic but miss everything else.

We all fantasize from time to time about what the ultimate radio setup might be. Of course, it will be different things to different people, depending on their listening habits and likes and dislikes. I've always liked base radios, and adding together several receivers with the NCS-3230 and a couple of nice speakers such as the Sounds Sweet would go a long way toward the ultimate station. I wonder if I could get away with two NCS-3230s and four speakers?

Your Input Needed

I'm always interested in your comments and questions. What would your ultimate shack look like? Perhaps if we get enough of ideas, we can put together an article and give other folks some ideas! Let me know what you think, and don't forget to enter the Frequency of the Month contest! Send information via e-mail to radioken@earthlink.net or via the more traditional method to Ken Reiss, 9051 Watson Rd. #309, St. Louis, MO 63126. Until next month, good listening! ■

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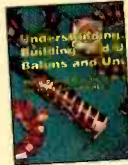


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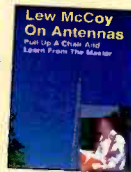
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Remote Broadcasts: An Exclusive Look Behind The Scenes

We hope that you've had a very productive DX season, and we hope this month is also one of your best! In this column I want to share what it's like to be behind the scenes of a radio remote broadcast, where a station or network goes to a special location and "broadcasts live" so the listeners will turn out and support the business by supporting the event. First we'll look at what's involved with a radio station doing a remote broadcast. Interestingly, I've set up many remotes over the years for small stations that didn't have big operating budgets.

Remotes 101

Yes, in the 30-plus years I've been in the broadcast engineering business, remotes are one thing I learned to be very creative with, especially with stations having a very limited budget. Most broadcasts are handled on RPU (Remote Program Unit) equipment, which is a VHF transmitter operating on 161 or 165, or 450 or 455 MHz. Stations are assigned a license to operate the units, and the frequency is generally set up by a frequency coordinator of the local chapter of the Society of Broadcast Engineers. This gives the station the ability to go within a 15- to 20-mile radius and not be tied down with a phone line (which was common practice years ago) to do a remote broadcast. For example, remotes may broadcast from a car dealer, restaurant, shopping center, or even more "daring" areas. Remote broadcasts can also involve news or sporting events, such as high school football. These all fall under the remote broadcast umbrella.

Prior to the broadcast, the station gives the information of the pending remote broadcast to the engineer, who at that point is given the responsibility of making it work. This is the time to make the magic of remote broadcasting work.

The station engineer contacts the person in charge of the event, such as the manager or public relations person of a business or the coach of a local high school team, to go over the dates, times, and location of the upcoming broadcast. In some cases, the engineer may have to go to the remote broadcast location to make sure that everything is going to work on the day of the broadcast. This would involve taking the transmitter and antenna to the site and making sure the radio station will get a good signal.

The engineer would also make notes on items, which would be needed, such as guest microphones for interviews or a field microphone for picking up crowd sounds from a sporting event. If the engineer is not going to be involved in the set up of the equipment on the day of the remote broadcast (often the person doing the remote sets up his own equipment if it's a simple broadcast where breaks are filled in the station programming), he'll supply information on where the antenna has to be located and the direction in which it should be pointed. Most of the time, though, a simple remote broadcast setup is comprised of



Pictured here is one of the newest digital remote systems available to broadcasters, known as the "Vector" and made by Comrex. It consists of a portable unit that weighs three pounds, can handle microphone and headphone requirements, and can supply great quality audio. The receiver is located back at the station and does the necessary audio conversions from digital to analog. These units hook into a standard "plain old telephone service" (e.g., dial up) line.

a microphone for the main announcer, a guest microphone, and a radio for monitoring the station, so operators know when breaks are to be taken.

It's also the engineer's responsibility to make a remote work if it's at a location where there may be a problem getting the signal from the remote location back to the station. Let's suppose the engineer goes to the remote location and can't get a good quality signal back to the station, perhaps because of distance from the station or some obstruction, such as buildings, hills, or even too many trees! This is where a phone line comes into the picture. Years ago, the phone company offered "remote loops," which were dedicated lines used to set up a remote broadcast. The station would contact its local phone representative and place an order for a remote line as far in advance as possible. The phone company would then send a technician to make the hookup between the phone company and radio station. Many years later, special remote equipment allowed for a hook-up via a regular dial-up phone rather than a "remote loop," but the quality of the broadcast sound was lost due to the response limitations of a standard phone line circuits.

Today there are devices that permit the station to hook into a standard phone line using a modem and convert the analog audio signal into digital audio, and then convert it back at the station. This offers great sound quality and negates the need to set up a remote broadcast transmitter in situations where it may not work, making things even easier for the station. The digital system also gives the station a quality return feed, so there is no problem with listening or presenting the audio to the audience at the remote broadcast. And this is all done over a stan-



This is the latest Marti remote broadcast transmitter, which will put out 40 watts continuous duty in the 450-MHz spectrum. Marti remote units have been around since the 1960s, when the company was founded by George Marti in Cleburne, Texas, and became the standard for remote broadcast equipment. Broadcast Electronics purchased Marti in the '80s and has continued to supply the broadcasters with high-quality remote equipment. This unit, the SRT40A, requires an antenna and a receiver at the studio end, but does not require any type of phone line hookup. The frequency can be set to any channel in the 450-MHz area allowed for this type of service.

dard everyday POTS (plain old telephone service) phone line, such as the line you use for your computer dial-up service.

The Fun Remotes

Being involved in the broadcast field, remotes became a part of my life for many years. At some of the smaller stations where I worked, not only was I involved in making the remote broadcast work, but I was doing the actual broadcast! Somehow I pulled it off without any problems. I remember one remote setup I worked weeks on to make sure everything was perfect, including the hookups via digital phone lines to two major networks. Just as challenging was making sure that the host had a certain chair to sit in, certain bottled water to drink, a special microphone, and specific placement around the host of all others on the team (all of this only to have the host leave before the broadcast because the hotel where he was staying did something he didn't like!).

Then there was the football game where the person on the air calling the game got all excited and said, "he's at the 15, he's at the 5, he's at the 10...touchdown!"

Then there was the remote broadcast for a lawn and garden show, featuring a very well-known garden expert who received a call from a very excited person saying, "I've been stung by bees, what should I do?" Frankly, it scared the guest. I heard the question and told the host announcer to take a commercial break, at which time I dialed up the "last call" feature on the phone. That turned out to be one of the hosts' teenagers who was simply playing a joke.

Good Sports

Sports, as I've mentioned, have always been hugely important for radio. During practice season for football, it's good public relations for any professional or semi-pro football team to get its players out for the public to see and meet. An interview-

type program is the best way to do it, either via a network (such as ESPN) or on the local level. A few years back, a station I was doing engineering work for signed a contract to do an interview program of a team during its practice time before game start-up. This remote event involved broadcasting out of a basement lounge and back to a station that had such a bad signal, it couldn't be heard where the remote was being done!

How do you get a signal out of such a place? We used what was called a "double hop" system where the signal is sent via one transmitter (a 450-MHz RPU) to a receiver, and then resent via a second transmitter, generally located at a spot where the transmitting conditions are more favorable (in this case, it was 30 watts being run into a directional beam antenna at about 200 feet). Not only did the 161.67-MHz signal get back to the station crystal clear and static free, but it also covered about a 75-mile area and was heard as far away as 50 miles on another station's remote system! The broadcast involved interviews with the team players. At one point, one player, who was about seven feet tall and about five feet wide came in and was showing everyone just how tough he was...until he was fitted with a sports headset (headphones and microphone all in one piece). At that point, the player lost all his playing field showmanship and became so frightened by the microphone and hearing himself that he immediately became a "Whispering Smith," complete with small, squeaky voice that was so low it wouldn't move the needle on the remote mixer level meter! This went on for about 45 minutes, but as soon as the headset was taken off, it was back to the rough-tough football player!

What was even better on this remote was that it actually had listeners calling in who could hear the signal from 161.67 MHz on their scanners and not from the regular broadcast station! I still believe that broadcast actually had more listeners on the 161.67 signal than it did on the AM station it was being carried on!

New Systems And "Inventions"

Digital systems heralded a new form of remote broadcasting, not only for engineers but also for the people on the microphone at the remote location. With digital systems there is a delay of a split second in the digital to analog conversion. On one of the first digital remote broadcasts I was involved with, everything went fine, but no one had told us of the audio delay, so the announcer would hear himself off the air a split second after he actually spoke. This led to a few funny looks from the people stopping by, wondering why this reminded them of an old film with the sound out of sync with the picture.

Equipment "inventions" were a big part of a remote broadcast. They were created on the spot, when needed. In lieu of buying a very expensive telephone system where callers could be put on the air with a remote broadcast, one station asked me to come up with a system "on the cheap." In response, I purchased a speakerphone for less than \$50 and modified it to pick up the audio from the remote by way of the microphone input in the phone. The caller's audio was then delivered back to the remote equipment via the speaker itself, with some additional wiring in both cases. I think the station is still using this "invention"—made some 15 years ago!

So when you stop by to see your favorite station broadcasting live, take a moment to think about what's involved in the behind-the-scenes work of that broadcast. And if you've got any remote broadcast stories or photos, please send them

Shure has long manufactured a standard mixer for the needs of the remote broadcaster. Their first was an M67 mixer offering four inputs and a feedout that could go to an audio amplifier or dedicated phone line. The company's latest unit, pictured here, offers basically the same features, but adds more inputs, switchable between a microphone or unamplified input, such as a tape deck or other audio source.



along; we'll use them as space permits in your "Broadcast Technology" column!

Club Spotlight

We would like to start up a once-in-a-while-as-we-get-'em write-up on clubs, especially ones involved with AM, FM, or TV DX. We'll include the history of the club, what it specializes in, publication information, dues, contacts, etc. If you would like to see your club in the spotlight, please send your information to me at P.O. Box 3111, Scranton, PA 18505-0111 or -mail it to TheRadioColumn@aol.com. Next month we'll feature information on the National Radio Club.

A Good Station Gone

It was exciting to hear about the changes made at WSAI-1530 from Cincinnati, Ohio, when it dropped its "oldies" format, but sad to say, it is now gone, replaced with a talk format and call letter change. It's back to its former WCKY! I'm sure that bottom line operating came into play on this, but I was very sad to see it go. Gone are the great jingles, the high energy DJs, some great oldies, and audio that's really hard to find!

Low Power AM DXing?

Want to try for some low power AM DXing? Here's your chance, with some recent FCC license changes for AM stations having nighttime service:

1580 KAMI	Cozad, NE	adds 17 watts night service
600 WCVP	Murphy, NC	granted 20 watts night service
940 WGFP	Webster, MA	granted 4 watts night service
920 WPTL	Canton, NC	granted 38 watts night service
940 WGRP	Greenville, PA	granted 2 watts night service
940 WECO	Wartburg, TN	granted 16 watts night service
970 WNIV	Atlanta, GA	granted 39 watts night service
1420 WEMB	Erwin, TN	granted 20 watts night service
1590 WCAM	Camden, SC	granted 27 watts night service

Other Station News

97.5 WPST, Trenton, NJ, swaps dial positions with WTHK 94.5 Morrisville, PA. WPST was at the 97.5 position from way back in the late '60s

105.7 WXYV, Baltimore has started running "WHFS" at

night and on the weekends. WHFS was a long-standing and well-known modern rock/progressive rock station for eons in the Baltimore/Washington area. Why the change? The 99.1 signal, still licensed as WHFS, has switched to a Spanish/Tropical format!

1140 KSFN, Las Vegas, NV, has switched to an All Men's Format, now known as "Spike 1140"

107.9 KVMA, Shreveport, LA, has gone silent.

640 KFI, Los Angeles, had its tower taken down in late December when it was struck by a private plane landing at an airport near the station. KFI will be operating for some time with 25,000 watts day and night from an auxiliary tower until the long process of getting all the permits to rebuild the main tower is complete and the tower actually put back up. Reports from DXers in the west say that the 25,000-watt signal is far less audible and opens up the chance to hear stations on adjacent frequencies.

98.7 WOQL, Keene, NH, swaps calls and formats with WINQ 97.7.

1440 WC DL, Carbondale, PA, has returned to the air after a 14-month silence with a "Classic Country" format with new studios in downtown Carbondale.

1680 WLAA, Winter Garden, FL, was fined \$18,000 for not having an operational EAS system.

1330 WCVC, Tallahassee, FL, was given a \$7,000 fine for not having properly maintained fences around its towers.

1220 WRIB, Providence, RI, has been running a special station ID between 0255 and 0305 (EST) daily with a special code identification.

1620 WB3XNN, Milford, PA, an experimental station, was on the air for the month of January for the purpose of conducting field intensity measurements. It aired between 0930 and 1500 with station identifications each hour.

Broadcast Loggings

1590 WFBR, Glen Burnie, MD, noted briefly with station ID as "Famous 1590—WFBR Baltimore" then quickly faded. WFBR operated on 1300 for many years and was known as "the Baltimore Radio Show" in its heyday! Glen Burnie is a Baltimore suburb.

1650 KCNZ, Cedar Falls, IA, with full ID and promo for "Sports Talk," then Jim Bohannon. Nice to hear a "K" call in the east again (not forgetting KDKA or KYW!).

1520 WWKB, Buffalo, NY, a crystal clear, non-fading signal noted on this one while traveling the haunts of I-84 with

oldies and Jack Armstrong, IDing as WKBW. They are also running AM stereo!

540 WWCS, Canonsburg, PA, an audible daytime signal during the day in northeast Pennsylvania with feature "Radio Disney." Signal was mixing with WLIE-Islip, NY, with a business talk format.

720 CHTN, Charlottetown, Prince Edward Island, an early evening visitor, often before sunset, featuring an Oldies format. Noted with fair signal and ID.

1140 CHRFB, High River, Alberta, tentative with country music noted way under WRVA. If this was indeed CHRFB, it would be my first (almost) West Coast logging in years. WRVA then became a lot stronger and stayed there. This is a good one to look for in the east.

1160 WSKW, Skowhegan, ME, noted with ESPN sports, ID as "The Score." Noted with WYLL, which was also very strong at times. This one is a good bet for those who want to log the state of Maine.

1340 WALL, Middletown, NY, noted with Spanish programming, simulcast with 1390 WEOK.

All loggings were from your trusty columnist, using a GE Superadio II and a 2000 Ford Escort car radio while in my work travels in the Great Northeast United States. I would appreciate *your* loggings also, so please send them along!

Future Radio, And Coming Your Way!

How much have computers changed radio? I plan to discuss this soon, providing some insight into what they mean to the broadcast world by looking one of the leading computer broadcast suppliers. We'll also take a look at a unique AM directional system for two stations, where one tower is common to *both* stations and, in their Top-40 days, which were in fierce competition with each other. Religious/conservative programming is now coming from the same studio location where the Top-40 battles once took place! We'll also get you ready for the FM DX season, looking at some tricks that will help you hear stations, including tips from some expert DXers!

Speaking of experts, we'd also like to hear from YOU! We invite your input on broadcast items you may want to read about, including special articles, DX techniques that have worked for you, and what you're hearing. See you again next month, and don't forget to send in those broadcast loggings. ■

Call Letter Changes

840	WCEO Columbia, SC	was formerly WSCQ (for just a few weeks!)
1530	WCKY Cincinnati, OH	was formerly WSAI (back here after a change from many years ago!)
1250	WSSP Milwaukee, WI	was formerly WEMP (another heritage call gone)
730	WBLO Thomasville, NC	was WZXY for all of two weeks
700	WJOE Orange-Athol, MA	was formerly WCAT
1490	WTVL Waterville, ME	was formerly WODJ (for two weeks)
97.5	KRWP Beaumont/Houston, TX	was formerly KRWP
27	KSFX Springfield, MO	was formerly KDEB
64	KTFK Stockton, CA	was formerly KFTL

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Back To Basics—Part IV: Shortwave Receivers Plus Military-Technology Update

So you have the radio basics under your belt and are ready to lay down your hard-earned cash for an HF receiver. You've studied the advertisements in *Pop 'Comm* and other radio-hobbyist magazines, but still can't decide which receiver is best for you. Well, then you've come to the right column, so grab a cup of java and read on.

Old School Vs. New School

Some of us old crows just love listening in on the world with a vintage rig that not only looks better than today's black boxes, but still works great at pulling those weak signals out of the noise. Yet we still lust after the new computerized gear on the shelves, those boxes having so many new and useful features that eclipse anything I had as a kid.

As I've said (too many times in this column), my great-looking Panasonic RF-4900 is a real trooper and excellent at receiving communications that my WinRadio cannot even hear. The WinRadio's features (and design) are light years ahead of my '70s-era, drifting-tuning and noise-susceptible tuner.

I've found that younger kids naturally are drawn to my Panasonic by its huge knobs and cool, green digital frequency readout, but older kids are so computer-driven these days that having a receiver that cannot be computer controlled is unthinkable. With that in mind, since there are no hard and fast rules set down when it comes to what you can use to monitor utility stations, I'll leave it up to you which way you want to go. Usually good, used 1980s and '90s equipment is less expensive (and will serve you well), but you can't beat a brand-spanking-new receiver for performance.

Entry-Level Receivers (both old and new school)

Now that you are totally confused, let's begin with stand-alone receivers (both old and new) that I consider entry-level—those which are great for beginners, yet are just darned good radios that you'll still want to use even when you've become a utility-monitoring expert.

Old School: Realistic DX-440/Sangean ATS 803

Basically, this is the same receiver sold under various manufacturers' labels. The DX-440 is a 1980s' vintage PLL digital HF communications receiver that is a great first receiver for a teenager or for yourself. Millions sold, the DX-440/ATS 803 has enough basic features (including SSB capabilities and programmable memories) to allow you to intercept many utility-station modes. Stable, with no frequency drift and compact, the DX-440/ATS 803 series radios can serve as a good portable unit for field use, or they are right at home hooked up to a long wire in your shack. They can be found on eBay for around \$30 to \$100, but I wouldn't pay more than \$70 for a good used unit. Either is an excellent first shortwave receiver for the youngster in your life.



The Grundig YB-400PE is one of today's best-selling receivers.

New School: Grundig YB-400PE

A modern-day equivalent of the DX-440, the YB-400PE is one of the best-selling entry-level HF receivers today. It is SSB and CW capable with a direct-entry keypad plus 40 station memories. Dual-bandwidth switch—plus scan, search, and clock timer capabilities—makes this little radio a great buy for the beginner or as a second radio to back up a big rig. It sells new for from \$99 to \$130.

Old School: Panasonic RF-2600

In actuality, an analog radio with a digital frequency counter built in, the RF-2600 is an impressive-looking radio with good sensitivity and performance, but it very limited in features. In its day it was sold in consumer electronics stores by the millions, and there are still quite a few of these units to be had on the used market. A single-channel radio with no memory capabilities such as are found on today's receivers, the RF-2600 is best used as a base radio for monitoring your single favorite utility station. Mine is glued to 8.982 MHz (my favorite HF MILCOM frequency) 24 hours a day (for frequency-stability reasons) and rarely is used to search the bands for other utility stations. I treat 8.982 MHz and 11.175 MHz as if they were "guard" channels, and use my WinRadio for searching through the HF MILCOM frequency bands. Good-condition RF-2600s can be found on eBay for just over \$100, but sometimes these still-popular radios will go as high as \$250. Unless you are a vintage HF receiver buff (like I am), I wouldn't pay that much, and you would be better served buying the radio listed next.

New School: Sangean ATS-818 ACS

A step up from the Grundig YB-400PE, the ATS-818 is a good-quality HF receiver with built-in cassette recorder plus SSB and CW reception capabilities. Features include RF gain control, wide-narrow selectivity switch, direct-entry frequency



Sangean's ATS-818 ACS shortwave receiver includes a built-in cassette recorder and has 54 memories.

keypad, and manual tuning knob, plus 54 memories (18 for shortwave) and a nice, big backlit LCD readout. Sold new for just under \$200.



Sony's ICF-2010 has been discontinued, but during the '80s and '90s more of them were sold than any other receiver.

Old School: Sony ICF-2010

During the 1980s and '90s, more ICF-2010s were sold than any other shortwave receiver. A great rock-solid performer, the ICF-2010 is still a much-sought-after radio fetching as much as \$300 for units in good condition. The ICF-2010 set the standard for almost every modern HF receiver to come. Features include drift-free synchronous detection, PLL-synthesized tuning, and the added bonus of being able to tune in the AM civil aviation band (116 to 136 MHz).

New School: Grundig Satellit 800

A great performer packed with advanced features, the Grundig Satellit 800 is the modern equivalent of the SONY ICF-2010, but much more refined. The Satellit 800 is surprisingly portable, yet is still a full-size, tabletop rig that features full, rich sound; synchronous detection (to reduce fading); three audio filters (6/4/2.3 kHz); and a large backlit LCD panel that displays frequency readout, receiving mode, audio filter selection, AGC (Automatic Gain Control), and dual 24-hour timers. Other features include a direct-entry keyboard and a large tuning knob for dialing through the bands and VHF aviation-band



The Satellit 800 by Grundig weighs in at 14.5 pounds and is a large radio that's also large on features.

reception. New, the Satellit 800 can be found through many radio communications retailers ranging from \$450 to \$500.

Stay tuned, as next month we'll turn it up a notch (in price range) and take a look at medium- to high-end dream receivers, both old and new school! I also want to know what works best for you. What is *your* personal review of modern receivers on the shelf today? Send your comments to me via e-mail: webbfeat@ls.net.

Military Technology Update

One of my favorite aspects of Utility Monitoring is MILCOM. Successful and enjoyable military monitoring takes hard work and a good base of background information. That's why sometimes I post information that on the surface may not seem directly related to Utility Monitoring, but the more you know about the military the more you'll get out of your MILCOM monitoring. Read and file the following information for future reference.

I don't know if you've seen it, but there's a cool snippet of video that has been circulating for years. It shows an F-15 Eagle fighter being launched from a submerged submarine. It has never been claimed to be anything other than what it is (a clever example of homebrew special effects), but it was sent to me (several times) by gullible (but well-meaning) friends who thought it was the real thing.

The video shows a calm sea with the sudden eruption of water and an F-15's nose breaking through the spray and erupting up into the air like a sea-launched ICBM (InterContinental Ballistic Missile)! In fact, that's what the video originally showed. Someone cleverly pasted a 3-D image of a jet fighter over actual footage of a Trident ICBM launch.

As ludicrous as it might seem, though, Northrop Grumman Corporation has found a way to launch almost anything from a submerged submarine. According to a recent press release:

Northrop Grumman Corporation (NYSE: NOC) has successfully demonstrated a new technology which will allow weapons and vehicles to be released from submarines even if they were not originally designed for undersea use.

During the U.S. Navy's recent Silent Hammer exercise, a simulated unmanned aerial vehicle (UAV) was successfully released from a submerged submarine to the sea surface using a low-cost, disposable encapsulation system. The demonstration was conducted on board the *USS Georgia* off the southern coast of California.

Developed by Northrop Grumman's Electronic Systems sector, the so-called Stealthy Affordable Capsule System, or SACS, is a modular

encapsulation system that enables "non-marinated" UAVs and weapons to be launched from a submerged submarine.

Without such technology, weapons and vehicles must be specifically designed to withstand underwater conditions.

How James Bond! Imagine covert operatives inserted into a hostile country by launching them (in a small, stealthy, disposable aircraft) at night from a silent and invisible submarine lurking off the coast! Q would be proud.

EHF Satellite Delayed

The Pentagon's Advanced Extremely High-Frequency satellite program to produce a military-communications satellite follow-on to the MILSTAR system has hit a snag, driving up the cost of the system by 20 percent. A problem in the production of a critical crypto-subsystem will extend the gap (between fieldable systems) by about five years.

The AEHF satellite system is designed to provide more powerful and much wider bandwidth military communications capabilities and also be hardened against nuclear attack and enemy jamming. The Pentagon had put the program on the fast track for development due to the loss of a multi-million-dollar MILSTAR satellite after a flawed 1999 Titan launch deposited the satellite in a useless orbit.

Protecting Airliners From Attack

As part of a joint Air Force/NASA initiative to identify the security vulnerabilities of post 9-11 aircraft (including military and civilian), technologists are assessing the chances that an airliner could be crashed (or commandeered) by electronic means. While ground-to-air missiles, such as the Stinger, are considered the biggest threat to aircraft, terrorists armed with high- and low-tech electromagnetic weapons pose a growing concern.

Research scientists are exploring ways to protect aircraft from electromagnetic weapons that could trigger fuel-tank explosions and also ways to foil radio-frequency attacks on vulnerable avionics that could disable an aircraft's controls. Developers will start by monitoring regular RF activity onboard commercial aircraft and identifying weaknesses.

Laser Attacks

Also under consideration are ways to thwart attacks from high-powered and low-powered laser beams that could blind crew and passengers or even burn through aircraft surfaces. The FAA reports that in 2004 there were ten incidents in which transport aircrafts were "lased" from the ground either by accident or on purpose. Last September a green light striking a Delta Air Lines aircraft on approach to Salt Lake City burned the retinas of the first officer, and in late December 2004 a New Jersey man was arrested for a laser-related incident involving aircraft operating out of the Morris County, NJ airport.

According to a bulletin (released jointly by the FBI and Transportation Security Administration) entitled "Potential Laser Threat," the terrorist threat to commercial aviation is described as low, with the recent spate of incidents being described as "accidental or pranks." However, according to intelligence agencies, terrorist groups have expressed "some interest" in using laser devices.

The Air Line Pilot's Association First Vice President Dennis J. Nolan said, "Lasers are definitely a threat from a safety standpoint. A really tight beam, even if it is low-powered, aimed at a person's eyes in an airplane at 2,000-3,000 feet AGL can cause a problem." When asked if a laser could physically damage an aircraft, Dolan said, "There is basically nothing on the exterior of an airplane that would be sensitive to that type of damage. The human eye is much more fragile."

High-Tech Terrorists Keep U.S. Intelligence Agencies Scrambling

With the evolving war in Iraq, many Iraqi insurgents have grown wise to the fact that their cell phones are vulnerable to U.S. interception and have developed ways to thwart eavesdropping. Some terrorist cells have acquired new encrypted wireless telephones that are close to impossible to decipher by U.S. intelligence agencies. Other cells are using low-powered walkie-talkies that can be hard to intercept inside urban environments such as the narrow streets of Baghdad, and although most radio communications are made in the clear, the insurgents are adapting by using code words and slang terms unknown to U.S. interpreters. Long gone are the days of listening to terrorists discussing their plans openly on clear channels.

In light of these developments, U.S. capabilities against encrypted cell phones and walkie-talkies are still considerable. What can't be deciphered or understood can still be selectively jammed, denying terrorists a reliable line of inter-communications. New RF-gathering UAVs (Unmanned Aerial Vehicles) that can collect as well as hinder insurgent communications are being deployed. New "hyper-spectral" sensors that can identify targets (such as cell-phone triggered bombs) from a long range and over a wide area are being developed so threats can be assessed long before U.S. forces enter an area.

Star Wars on HF

Imagine the year is 1976. You are a utility monitor or ham radio operator tuning through the HF bands and you intercept what sounds like military combat traffic, possibly an attack by a squadron of fighters on some kind of battle station! The voice sounds uniquely American and very excited, as if he is in the heat of a climatic battle. You jot down or record some of the snippets you hear, such as: "Cut the chatter, Red Two!" and "Stay on him, Porkins. I'm right behind you!"

If those phrases sound familiar, it probably means you are a *Star Wars* fan and recognize them as the combat chatter used in Episode IV, when the valiant Rebel Alliance X-Wing squadron attacks the evil Death Star. It's one of the most exciting scenes in cinematic history, and it made an indelible imprint on my (then 16-year-old) brain, because it was fast, fun, and (although it took place in a galaxy far, far away) seemed incredibly real.

But as a starry-eyed teen in the '70s, I did not notice that one of the elements that made the scene seem so real was the expertise that went into the sound-effects design. The special dialog and sound-effects editor for *Star Wars*, Ben Burt, went beyond the call of duty to collect sounds for the movie that were very purposely familiar (not at all out-of-the-world, like most sci-fi movies of the day) and constructed and based on our earthly experiences. As a sound engineer, Burt's task was to invent a

soundtrack that would strike an emotional chord, while making this alien space opera seem well, not so alien and something we all could identify with.

What does that have to do with Utility Monitoring? One of the reasons why the communications chatter between the X- and Y-wing pilots sounds so realistic is that it is based on the real fighter-pilot communications of the day, such as could be heard during news footage of the (then) still fresh in our minds Viet Nam War. Burtt did extensive research into military communications terminology, phraseology, and structure used by the fighter pilots of the day.

If you are like me and you rushed out and bought the original *Star Wars Trilogy* on DVD and have not watched the movie yet (while listening to the audio commentary channel), do yourself a favor and do so. Not only do the comments by the cast and crew give you a unique insight into what went into making this timeless classic, you'll also discover some of the unique sources Ben Burtt drew upon for his sound-effects pallet.

In the commentaries, both George Lucas and Ben Burtt describe how they increased the reality of the sound of the combat chatter by taking pieces of dialog

and actually transmitting them over HF to an SSB receiver (connected to a recorder), tuning it slightly off frequency (giving the chatter that realistic raspy sound), and then inserting them into the sound track.

It's fun to think that quite possibly back in 1976 a Utility Monitor or ham radio operator could have intercepted the communications of the attack on the Death Star, not at all knowing that what he was hearing was not the communications of a military confrontation, but the sound effects to be used in a movie that would revolutionize modern cinema. Like I've always said, keep your ears to your receivers. You never know what you might intercept.

Readers' Logs

Wow! I guess my plea to get you to send your loggings in worked. There are lots to go through, so let's get to it!

0000 (Frequency MHz): STATION, Anytown, USA, summary of traffic heard in MODE at 0000 (monitor/sometimes location)

3285.0: USAIS1012 (Army Intelligence & Security Command, Ft Belvoir VA-Net Control): 1522 USB/ALE TO USANG2409 (US Army National Guard HQs, Arlington VA). Also on 05066.5 and 06985.0. US Army Continuity of Operations (COOP) Net. (RP)

3389.0: UNID SS YL with 5-figure groups, Poor audio. AM at 0109 (CG)

4372.0: 7FE, 8NR, and FRANCHISE in Link-11/Link-16 coordination net. Kicking data freq to GREEN 02 at 0042. (MC)

4469.0: SOUTHEAST CAP 47 taking check-ins from SOUTHEAST CAP 30, SOUTHEAST CAP 43, TENNESSEE CAP 120, LITTLE JOHN 1030, GOLDENROD 181, and GEORGIA CAP 461 in Southeast CAP Net at 0107. (MC)

5211.0: NMN CAMSLANT check-in with WGY912 (FEMA, Mount Weather, VA) at 2325. (MC)

5696: COMSTA Kodiak getting flt ops from CG 1707 at 0110. (DS2 WI)

5696: CG Sector San Juan calling CG 2102 in the red w/no joy at 0415. (DS2 WI)

5696.0: Sector San Juan wkg CG 2102 (HU-25) regarding their fuel status for a PIW SAR at 2316. (MC)

5708.0: SENTRY 50 (E-3 AWACS) ALE initiated call to Tinker AFB Meteo for WX at 2123. (MC)

5711.0: NCS (SHARES National Coordinating Station, Arlington VA): 1745 USB/ALE TO KNY66 (SHARES station). (RP)

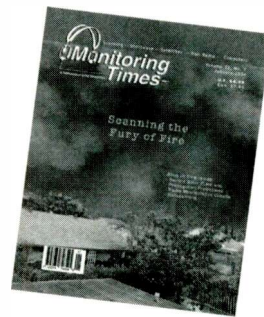
6604.0: NEW YORK Volmet with aviation wx at 1340. (DS2 WI)

6694.0: SWORDFISH12 sending immediate traffic to Halifax Military monitored at 1333. (DS2 WI)

6697.0: MYSTIFIED bdcsting EAM. (DS2 WI)

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6721.0: SENTRY 50 ALE initiated call to Tinker AFB Meteo for WX between South Carolina and Tinker at 2125. (MC)

6721.0: RIC (Civil Air Patrol, Nat'l Technology Center, Richmond VA): 1717 USB/ALE sounding. Also sounding on 9025.0. (RP)

6739.0: REACH 109Y p/p via Puerto Rico HF-GCS for WX at Kogalniceanu, Romania at 0211. (MC)

6745.0: CANFORCE 2639 (CC-130) p/p via TRENTON MILITARY to WING OPS at Trenton followed by request for WX at Trenton and Rochester, NY at 2245. (MC)

6797.0: UNID SS YL with "atencion" several times, followed by 5-figure groups. Pause after every tenth group. AM at 2203. (CG)

6855.0: UNID SS YL with 5-figure groups. AM from 2111-121. (CG)

6911.5: KRQNG (North Carolina ARNG, Rowan County Airport, Salisbury, NC): 1651 USB/ALE sounding. (RP)

6911.5: EAATS (Eastern Army Aviation Training Site, Muir AAF Ft. Indiantown Gap, PA): 1735 USB/ALE sounding. (RP)

6985.0: USACE1010 (Army Corps of Engineers): 2138 USB/ALE sounding. (RP)

7527.0: "HAMMER EAST NODE" wkg "OMAHA 31SK" to inform them they are approved for ops in the Cuban outer ADIZ and they are to squawk Company 01 at 1846. (MC)

7527.0: OMAHA 9SK with position report to HAMMER at 2216. (MC)

7632.0: NNN0KAG and AAV4AR taking SE SHARES RCS net check-ins at 1729. (MC)

7633.5: RAZOR 88 (E-8 JSTARS) p/p via AFA2MH Georgia to LUMBERJACK at Robins AFB at 1819. (MC)

7635.0: MIDDLE EAST 34 checking into CAP net at 1509. (MC)

7650.0: R23454 (probable UH-60, 2/238th Avn INNG): 1718 USB/ALE TO T2Z238 (2/238th Avn, INNG, Shelbyville, IN). Also noted on 08171.5, 10151.5, and 11439.5. (RP)

7849.0: CLC25M (Local Communications Center-Mobile, 25th Inf Bde): 1034 USB/ALE TO CRC2M (Regional Command Post-Mobile, 2nd Military Region). (RP)

7887.0: UNID SS YL with "atencion" several times, followed by 5-figure group. Pause after every tenth group. AM at 2000. (CG)

8030.0: CARRERA (unidentified, Mexican military): 0019 USB/ALE TO ALFA (unidentified, Mexican military). (RP)

8030.0: ELTA (unidentified, Mexican Army): 0235 USB/ALE TO ALFA (unidentified, Mexican Army). (RP)

8045.0: ASTRO (Mexican military): 0105 USB/ALE TO ROBLE (Mexican military). (RP)

8047.0: A040LN (Nat'l Guard, Alabama): 1530 USB/ALE TO PMTRACS (Program Manager for Tactical Radio Communications Systems). (RP)

8060.0: SCLC222M (Subordinate Local Communications Center-Mobile, 22nd Mo-

torized Inf Bn, Venezuelan Army): 0111 USB/ALE TO CLC22M (Local Communications Center-Mobile, 22nd Motorized Inf Bde). (RP)

8065.0: SKYWAT (Army Flight Following Service [AFFS], Soto Cano AB, Honduras): 0106 USB/ALE TO RUH 963 RUH957 & RUH993 (probable UH-60A helos, 1/228th Avn Bn, Soto Cano AB Honduras). (RP)

8084.0: ACERO (possibly HQs, Mexican Air Force): 0317 USB/ALE sounding. (RP)

8097.0: UNID SS YL with "atencion" several times, followed by 5-figure groups. AM at 1800Z. (CG)

8171.5: R24323 (UH-60, 1/159th Avn Ft Bragg NC): 1702 USB/ALE TO T1Z159 (1/159th Avn, Ft Bragg NC). (RP)

8171.5: 86OPS (86th Med Coy, VTNG, Colchester/Burlington VT): 2019 USB/ALE sounding. Also sounding on 06911.5 & 09295.0. (RP)

8171.5: KFMHNG (Nat'l Guard Bureau, Otis ANGB MA): 1641 USB/ALE sounding. (RP)

8187.0: CLC25 (Local Communications Center-Mobile, 25th Inf Bde, Venezuelan Army): 0146 USB/ALE TO SCLC251 (Subordinate Local Communications Center, 251st Inf Bn). (RP)

8301.6: Sector San Juan wkg unid asset to instruct them to search for 30 more minutes then RTB to Borinquen at 1132. (MC)

8337.6: X2S clg L2Z with No Joy heard at 1140. (MC)

8846.0: NEW YORK Radio wrking TAG 168 with routing. (DS2 WI)

8864.0: Air CANADA 881 sending pos. rpt to GANDER Radio at 1350. (DS2 WI)

8912.0: CG 1502 p/p via SERVICE CENTER to CLEARWATER AIR discussing delivery of an HH-60 part for OPBAT monitored at 1450. (MC)

8912.0: TIGER01 and CG 1717 discussing HF secure and ALE comms at 1336. (DS2 WI)

8971.0: GOLDENHAWK and 3MT (id 222) testing secure HF comms monitored at 1325z. (DS2 WI)

8983.0: CAMSPAC wkg RESCUE 1714 (HC-130, CGAS Barbers Point). 1714 is wkg a SAR case for sinking vessel *RED DIAMOND* at 0017. (MC)

8983.0: Camslant Chesapeake: 2255 USB w/CG 1706 (HHC-130, CGAS Clearwater) asking if they have comms w/Juliet 40 (HH-60 # 6040, CGAS Clearwater). Camslant advised that J40 has contacted homplate via UHF. (RP)

9007.0: CANFORCE 2053 wkg TRENTON MILITARY for WX at Dakar, Senegal at 0326. (MC)

9052.0: SCLC222M (Subordinate Local Communications Center-Mobile, 22nd Motorized Inf Bn, Venezuelan Army): 2316 USB/ALE TO CLC22M (Local Communications Center-Mobile, 22nd Motorized Inf Bde). (RP)

9065.0: R0310 (probable helo, Idaho NG):

0000 USB/ALE TO KBOING (1/183rd Avn or 1/112th Avn, Idaho NG, Boise Air Terminal/Gowen Field, Boise ID). (RP)

9081.5: KFMHNG (probably 3/126th Avn MANG, Otis ANGB MA): 1758 USB/ALE sounding. Also sounding on 08171.5. (RP)

9106.0: WGY9900 (American Red Cross, Arlington VA): 1619 USB/ALE sounding. (RP)

9295.0: RVHNY (Nat'l Guard, Riverhead NY): 1707 USB/ALE sounding. (RP)

9380.0: 1002 (unidentified): 0309 USB/ALE sounding. (RP)

10000.0: OC1 (FBI, Oklahoma City OK): 1603 USB/ALE TO DL1 (FBI, Dallas TX). (RP)

10051.0: NEW YORK Volmet brdcting aviation wx. (DS2 WI)

10600.0: CORE7 (Commander, 7th National Guard Region): 1120 USB/ALE TO CGGN (HQs, National Guard). (RP)

10670.5: 86OPS (86th Med Coy, VTNG, Burlington VT): 1701 USB/ALE sounding. Also sounding on 08171.5 & 09295.0. (RP)

10720.5: Razor 66 (E-8 JSTARS, Robins AFB GA): 1708 USB calling Strike Star w/no response. (RP)

10993.6: CG 1706 clg Sector Key West then gets W7E to relay their position heard at 1626 (MC)

11175.0: TROUT 99 (C-135C) p/p via Puerto Rico HF-GCS to Meteo for 0630z WX at UGGG (Tbilisi, Georgia) at 0531. (MC)

11175.0: Terra 44 (B-757/C-32A 486 FLTS, Eglin AFB): 1605 USB w/Puerto Rico in pp/Scott Metro w/request for landing wx at McGuire. (RP)

11181.0: REST CAMP wkg ANIMOSITY at 1422. (MC)

11205.0: VOLT 27 (C-17A) check-in with SMASHER. Departed KCHS en route Guantanamo Bay. Heard at 1547. (MC)

11205.0: R40177 checking in with SMASHER with departure time from Bogotá, Colombia at 1923. (MC)

11220.0: Andrews HF-GCS radio check with SAM 201 at 1340. (MC)

11220.0: DOOM 91 (B-52H, 2 BW) p/p via Andrews HF-GCS to Barksdale AFB CP at 1731. (MC)

11226.0: BLUE 66 w/ McGuire CP via pp LAJES at 1532. (DS2 WI)

11232.0: UN03 rcvng wx and then pp to Wing OPS via Trenton Military at 1530. (DS2 WI)

11232.0: Trenton Military: 1945 USB w/Razor 61 (E-8 JSTARS, Robins AFB GA-not heard) in pp w/Peachtree Ops passing formatted report info and requesting wx for Robins. (RP) 11232.0 Trenton Military: 2200 USB w/Sentry 41 (E-3B AWACS, Tinker AFB) in pp w/Phoenix Ops. Tries to send formatted report info but Raymond 24 (Tinker AFB) asks that they relay info through Trenton Military. (RP)

11232.0: Canforce 2668: 2215 USB calling Trenton Military w/no response. Calls in blind

that they are closing selcal watch. (RP)

11232.0 Trenton Military: 2233 USB w/Sentry 31 (E-3B AWACS, Tinker AFB) in pp w/Raymond 24 (Tinker AFB) relaying formatted report info through Trenton Military. (RP)

11232.0: Trenton Military: 1704 USB w/Razor 66 (E-8 JSTARS, Robins AFB GA): in pp w/Strike Star (E-8 JSTARS, Robins AFB GA). Razor 66 advises Strikestar that they are airborne in the orbit area and are trying to contact Strike Star on 10720.5 & 327.7 MHz. (RP)

11232.0: Trenton Military: 2207 USB w/Canforce 2640 w/wx for Trenton & Ottawa. (RP)

11309.0: Navy RJ150 reving routing from New York Radio at 1459. (DS2 WI)

11330.0: NEW YORK Radio getting pos rpt and SELCAL chk with Continental 1950 at 1625. (DS2 WI)

11342.0: NEW YORK Radio wrking unreadable aircraft with pos rpt. (DS2 WI)

11387.0: Sydney: 1704 USB w/automated voice volmet. (RP)

11396.0: REACH 257 reving routing from New York Radio at 1532. (DS2 WI)

11410.0: OMNI 01 (P-3C) p/p via SKYWATCH to Naval Support Activity New Orleans reporting ETA at 1833. (MC)

11473.0: ANDREWS wrking aircraft (unreadable) for flt ops. (DS2 WI)

14493.5: SE1 (FBI, Seattle WA): 1703

USB/ALE TO AN1 (FBI, Anchorage AK). Also on 10913.5. (RP)

11494.0: CAMSLANT reving flt ops from aircraft (unreadable) at 1452. (DS2 WI)

11566.0: UNID with 5-figure groups (cut numbers) in CW at 1830. (CG)

12191.0: SCLC501 (Subordinate Local Communications Center, 501st HQs Bn, Venezuelan Army): 1357 USB/ALE TO SCLC513 (Subordinate Local Communications Center, 513th Jungle Inf Bn). (RP)

12537.0: PR1 (Radio Station 1 (Puesto Radio): 0120 USB/ALE TO DHN (Venezuelan Navy Hydrographic & Navigation Directorate). (RP)

13200.0: REACH 254, escorting flight of 3 F-16's, wrking Hill CP via pp ANDREWS at 1527. (DS2 WI)

13200.0: OFFUTT with a SKYKING message at 1555. (DS2 WI)

13270.0: New York Volmet w/aviation wx at 1635. (DS2 WI)

13306.0: ITALIA 636 snding pos rpt to New York Radio at 1637. (DS2 WI)

13375.0: UNID EE YL with 5-figure groups, each read twice. USB at 1512. (CG)

13927.0: REACH 4673 p/p via AFN2AC Miami to Westover JARB at 1842. (MC)

14653.0 OIR (Nat'l Guard, Oregon): 2234 USB/ALE TO W080YN (Nat'l Guard, Wyoming). Also noted on 16338.5. (RP)

14670.0: CHU Canada time station at 1641. (DS2 WI)

15094.0: KNY81 (SHARES station, Everett, WA): 1739 USB/ALE TO NNN0ELA (Navy/Marine MARS Salem SC, Southeast Region Digital Coordinating Station). (RP)

16283.6: KWK93 (US Embassy): 1727 USB/ALE TO KWK96 (US Embassy). (RP)

16607.0: ERMBEL (Brazilian Navy Radio Station, Belem): 2109 USB/ALE TO NDC-CMM (Brazilian Navy Large landing ship, *Mattoso Maia*, G-28). (RP)

17080.0 CNZACE (Venezuelan Navy, Central Naval Zone): 1306 LSB/ALE TO CAPANA (Capana-class Medium Landing Ship *Capana*, T-61). (RP)

17080.0 ALBATROZ (Venezuelan Coast Guard Point-class cutter *Albatroz*): 1958 USB/ALE TO BRION (Frigate, *Almirante Brion*, F-22). (RP)

18248.6: KWK99 (US Embassy): 1733 USB/ALE TO KWK96 (US Embassy). (RP)

18872.5: CVJACE (Brazilian Navy Corvette *Jaceguai* V-31): 2155 USB/ALE TO ERMRIO (Brazilian Navy Radio Station, Rio de Janeiro). (RP)

22245.0: GOAJIRA (LSM *Gojaira*, T-63, Venezuelan Navy): 1343 LSB/ALE TO BRION (Frigate, *Almirante Brion*, F-22). NOTE: New Ven Navy Freq. (RP)

This month's star contributors are, Mark Cleary (MC), Ron Perron (RP), Dwight Simpson (DS2), and Chris Gay (CG). ■

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Future Trends— And What They Mean To Our Hobby



Over the past few months I've been focusing on a number of heavy-duty technical topics, such as networking, programming, and the remote control of radios, all of which are important to your understanding of computer-assisted radio monitoring. However, every once in a while I think it's important to take a break and just stand back, taking a good long look at this whole business of computers and radios and trying to evaluate where things are going.

This month I'd like to do just that and have a conversation with you, speaking about a few things that have been on my mind and doing a little brain storming as well. So get a cup of coffee, or whatever beverage you prefer, and just sit back and let me share a few ideas and observations with you.

Don't worry. I don't plan on making a habit of this (or at least not very often), so by the next column I'll be back on track with hard information once again. Still, I think if you'll just bear with me, you'll learn a few things this month despite my apparent ramblings.

What's Happening Out There With Electronics?

I recently picked up a little portable audio player made by a company called BenQ at one of the many big-box electronic stores that have sprung up almost overnight in a former brown-field near me. When I say that it is a little audio player, I'm not exaggerating, as it measures only 2.5" x .5" x 1.6" and weighs in at 1.1 ounces. Yet thanks to computerization, this little device offers an amazing number of features, such as the ability to play MP3, WMA, and WAV files, which, depending upon which file format you use, can provide just over one hour of listening time.

This is the little audio player sold by BenQ. It is made in China, is the size of an old-style cigarette lighter, and weighs 1.1 ounces. At the same time, it has the features and audio sound that some full-size audio systems would find hard to beat. After a mail-in rebate it cost me \$30. (Photo courtesy BenQ)



This particular player also features 128 megabytes of memory, 200-MHz CPU, an eight-hour rechargeable battery, an FM radio with a PLL digital tuner, and a digital audio recorder for the FM radio or for voice, using a built-in microphone. The player also offers a number of different ways of processing the digital sound, either through an equalizer (classic, rock, jazz, or other music mode) or "colorizer" (warm, cool, or neutral sound).

In addition to all this you also can also control the way in which information is displayed on the LCD screen, re-format the memory, and determine how long the player will be on before shutting itself off, along with controlling a host of other features. Speaking of the LCD screen, it displays a whole wealth of information about what is going on in the player, such as file type, content, the lyrics of a song as it is playing (if available), and the bit and sample rate at which the file was recorded, as well as how many files are being stored.

That's not all, as you can connect the device to your computer so that you can upload and download audio files via a high-speed USB cable, which also supplies the power to recharge the built-in battery.

To allow for this transfer of files to the audio player, you are supplied with a software package to install on your main computer. Once the software has been installed, you can then organize your audio files on your computer so that they can be downloaded as pre-defined groups of music or audio information. You can even use the same software to create audio CDs if your computer has a CD burner built in.

Now believe it or not, I've actually *left out* a large number of features that are to be found in both the audio player and the supporting software in order to save some space in the column. All that I have related to you are simply the main features of the player—and remember that all of this resides in a package no bigger than an old-style cigarette lighter and weighs in at just over an ounce.

The bottom line for all this: What did I pay for this little audio player? Would you believe \$30 after the mail-in rebate? We are definitely living in an age of wonders.

A Quick, But Important History Lesson

What's so important about a little audio player and comput-

er-assisted radio monitoring? Why are all of the details that I just presented worthwhile reading?

I think it's important every once in a while to simply stop and really take a good look at what is going on in the world of technology in order to fully appreciate just how far we've come over the past few years. There is tendency among many people to simply take for granted the great changes that are occurring around us. Worse, I think many people have no real appreciation of the amount of effort that has gone into the everyday miracles that are now available to us at a really reasonable cost.

Let's sit back for a moment and consider the fact that when IBM introduced its first personal computer back in 1981, it had a CPU that operated at 4.77 MHz, had 640 K of memory, used 5.25-inch floppy disks to store 160 Kb of information, and could only display text on a green screen monitor, plus there was no audio other than a small speaker that emitted beeps. It cost around \$3000 in that configuration, and a year later \$2000 more would get you an optional 5-megabyte hard drive.

Yet despite that seemingly high price, IBM sold 200,000 units during the first year the computer was introduced. In order to understand why the IBM PC was successful, you have to look at the market to which it was being sold.

While most people tend to think that Steven Wozniak was the first person to create the personal computer with the Apple II, it has since come to light that in 1973 Mers Kutt of Micro Computer Machines in Toronto, Canada offered the world the first fully assembled and operating micro-computer that was specifically designed for the home market. That was one year before MITS offered the Altair 8800 in kit form, two years before IBM released the 5100 (IBM's first truly portable PC), and three years before the first Apple I was sold.

Kutt's MCM-70 cost about \$3500 and was a completely self-contained unit weighing in at about 20 lbs. and offering a built-in keyboard, monitor, and operating system based on the APL (Array Processing Language) programming language. Data for the programs used to run on the MCM-70 was stored using audio-cassettes (standard practice for personal computers until the mid-1980s), and it came with several useful programs, such as a spreadsheet. There were even a number of simple video games available for this computer, showing that it was definitely being marketed for the individual home user, rather than the corporate market.

However, the MCM-70 used an early Intel 8008 CPU running at 800 kHz and came with only 100 Kb of memory, plus the speed of the audio cassettes was slow when either storing or loading programs and data. So while being the first off the mark, it simply did not catch on in either the Canadian or US markets, as the technology was still in its early stages of development.

If there is a lesson here, it's the re-affirmation of the basic truth that winners get to write their own history, which is why you've most likely never heard about Mers Kutt or the MCM-70—along with a lot of other technology that never made it to the hall of fame but still contributed to your life today.

The truth about all makes and models of the early PC is that it was their lack of memory, proprietary software, and slow operation which made them unsuitable for anything but the hobby market. However, I'm sure brand names such as RadioShack's TRS-80, the Atari 400 and 800, Texas Instrument's TI 99-4a, Timex-Sinclair (a.k.a. ZX-81), plus the very successful Commodore 64 will bring back some fond memories for those who first started out in computing using them in the early to mid-1980s. I'm certain that many of those



Here it is, the IBM 5150 personal computer that was released in 1981 and made Time Magazine's "Man of the Year" cover. What you see in the picture probably cost between \$3500 to \$4000. What you got in return was an Intel 8088 CPU running at 4.77 MHz, two floppy disks with 160 Kb storage each, and monochrome monitor giving you 80x24 text display (no graphics). While having only a fraction of the computing power and memory that the BenQ audio player has today, they flew off the shelves and made computers a permanent part of our lives.

(Photo courtesy IBM)

memories also include thoughts of frustration over bad keyboard designs, awful mono-colored video monitors, primitive software, and a host of additional limitations that drove many computer companies out of the market or into bankruptcy.

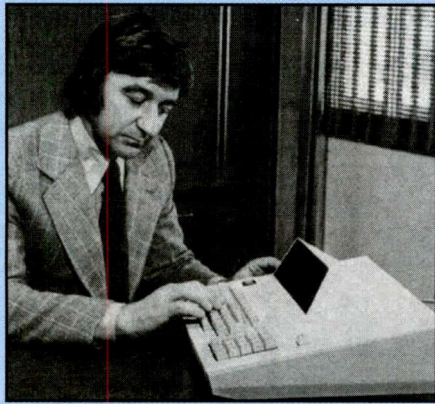
What made the IBM PC a success and the others' computers history? Well, simply, it was due to the fact that the new computer design was based upon "open architecture." Open architecture allowed third-party manufacturers to be able to sell peripheral products for use with the IBM PC without having to go through an expensive licensing process. The reason why the PC was developed this way was due to an interesting management decision on the part of IBM; they gave the development team 30 days to come up with a working prototype. The only way this could be accomplished was to use "off-the-shelf" hardware that had already proven itself to be reliable in other computer applications, and to license an existing disk operating system (or DOS) from another software developer rather than trying to develop it from scratch.

What's interesting about the decision regarding licensing DOS is that IBM ended up negotiating with a small company called "Microsoft." What IBM didn't know was that the owner of the company, Bill Gates, didn't actually have any DOS software to sell. Gates inked the deal with IBM to sell them the DOS software, and then went looking for a DOS program to buy so that he could license it. He found what he was looking for at a small West Coast software company.

It seems that the company in question, which was called Seattle Computer Products, had an employee by the name of Tim Paterson, who had sat down and created a rough (and questionably legal) copy of another popular DOS program then on the market. Bill Gates licensed the copied DOS for \$50,000 and immediately turned around and licensed it to IBM for millions of dollars. The rest, as they say, is history.

The Rather Strange PC Revolution

The only roadblock to a real revolution in the personal computer industry was one part of the PC that IBM was not going to share with anyone—the BIOS. The acronym for Basic



As you can tell from the haircut, it's 1973 and Mers Kutt of Micro Computer Machines of Toronto, Canada is checking out the new personal computer his company developed. Called the MCM-70, it was completely assembled and self-contained with a keyboard and monitor and only cost \$3500. Some now consider Kutt to be the true father of the PC. (Photo courtesy IEEE)

Input/Output System, the BIOS chip was what "woke up" when you turned the computer on and made everything work. Without the BIOS chip, the computer was nothing more than a big paperweight, and even if another computer manufacturer had all of the parts needed to make the computer, including the operating system, it would not be "IBM compatible" without that BIOS chip.

However, the market for personal computers was just too big, and it was not long before the Compaq computer corporation figured out how to clone the IBM BIOS through some tricky reverse engineering. The result was the very successful Compaq Portable computer, which was released in 1982. More important, when Phoenix Technologies was able to successfully produce a legal clone of the IBM PC's BIOS, a multi-billion-dollar industry dedicated to producing inexpensive "IBM compatible" personal computers was born.

The point of this story is that the micro-computer industry has been evolving over the past 35 or so years one day at a time, with someone coming out with a product or idea that seems to push design limits to the end point, only to have another person come out with something even more amazing a short time later, more by accident than design.

The bottom line is that nobody is in charge of the future of micro computing, nor has anyone been able to really predict the future of micro computing in any significant way. The history of micro com-

puting is filled with stories of "experts" having made big mistakes at key moments of computer technology. Good examples of this are Bill Gates dismissing the importance of the Internet, or Apple's Steve Jobs developing the "Newton" handheld computer (not to mention the Apple III). There was the Mattel Aquarius, which had a key on its keyboard which when pushed would re-boot the computer and wipe out all of your data. Then there was the DEC Rainbow, whose DOS lacked a format command for its floppy drives, so you had to buy expensive pre-formatted disks from the company.

Speaking of Bill Gates's many failures, does anyone remember the "Bob" version of Windows® that was released by Microsoft in 1995? Yes, there was actually a version called "Bob," which was named after the virtual "host" who "lived" in the operating system and invited you into his house, where you could do things such as send e-mails or type letters. Believe it or not, the spirit of "Bob" still lives in today's Windows® operating systems as a bit of an in-joke. Whenever you turn on the "Office Assistant" feature found in today's Microsoft Office programs (such as Word or Excel), you see the optional cat and dog characters, which are based on two counterparts who originally helped people out in "Bob."

The point is that there is no "master plan" for the microcomputer industry that anyone can follow towards some well-defined goal. I've been working in that industry since the early 1980s, and the truth is that everyone I know within it is just making it up as they go along.

What Does This Mean For You?

What does a \$30 digital audio player have to do with early PCs and big ideas that flopped? Well, I think it comes down to the fact that when I went to the store and saw the little audio player, I bought it. I bought it because the price was right and it had the features I was looking for. The same marketplace waved an Apple Newton at me, as well as the "Bob" operating system, and I, along with a large number of other people, didn't buy them.

When I opened the package that the audio player came in, though, I noticed that the unit and the software had been made in China. Now that's a small point, until you consider the fact that just this last December IBM announced it was selling the majority of its PC division to



This is the computer that many feel actually started the computer revolution—the Apple I. As the computer originally came in kit form, the builder would sometimes get rather creative, as you can see here. The turning point was when Steve Wozniak and Steve Jobs managed to make enough money to put the computer in a good-looking box. Then sales really took off.

a mainland China company called the Lenovo Group. What's interesting about Lenovo is that it was established in 1984 in Beijing by the Chinese government for the purpose of importing and distributing IT technology made by North American companies such as IBM, AST, and Hewlett Packard. The original office for the company was located on the grounds of the Chinese Academy of Science, and the staff was composed of 11 technicians from that school.

By 1990 Lenovo began to promote the idea of home use of personal computers to mainland Chinese, and by 1994 it was the best selling brand in that country, as it remains today. Before the merger, the company ranked as the ninth largest computer company in the world, with the majority of its sales being in the Orient. However, after the merger it will be the third largest, with a worldwide market.

The bottom line for the deal is that Lenovo will be allowed to use the IBM logo and other properties with the current line of IBM products for five years, and it has full access to IBM's sales infrastructure in 160 countries around the world. In order to fully exploit this global market, Lenovo is moving its head office from Beijing to New York City, where a new management team will reside, being made up of senior executives from both IBM and Lenovo. What IBM hopes to achieve through the combination of the two companies is to allow more penetration into the Chinese market of IBM's more profitable consulting services and high-end comput-

ing equipment. In return, Lenovo will make use of IBM's financial and service expertise to manage relations with new and existing customers, particularly in the corporate sector.

I think Charles Darwin summed up this current arrangement best when he said, "It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change." Likewise, I think Darwin's next statement also helps to explain this new business relationship: "In the long history of humankind (and animal kind, too) those who learned to collaborate and improvise most effectively have prevailed."

What's The Bottom Line For Computer-Assisted Radio Monitoring?

What do the purchase of a little audio player for \$30 and the sale of a computer division of a large corporation for about \$1.7 billion have to do with computer-assisted radio monitoring? Well, recently I dropped by a store (which will remain nameless) in upper New York State that specializes in CB radio accessories. The owner of the store designs and sells those accessories himself, but in our conversation one thing that stood out was the fact that in order to compete he had set up a relationship with an electronics manufacturing plant in China.

Now a lot has been made about "Buy American" as a way of supporting American business and workers, and I have absolutely no argument against that position and stand by it 100 percent. Yet from now on you increasingly will see more and more American products being manufactured in China and other countries around the world. More important, the deal that was made with Lenovo in China is going to result in the closure of IBM PC manufacturing plants in North Carolina.

On the other hand, DELL computer, which is currently the number one computer company in the world, announced a month before the Lenovo deal that it will be spending \$115 million on new PC manufacturing facilities in North Carolina. So you win some, and you lose some.

However, Dell also has PC manufacturing plants in Limerick, Ireland; Xiamen, China; Eldorado do Sul, Brazil; and Penang, Malaysia. Frankly, if you take a look at any successful player in the computer market today—whether it's the number one company, like Dell or a small

entrepreneur in upper New York State—you will see that they are working out because they have learned how to compete using the new global economy to their advantage.

The best way to understand this trend is to go to the corporate website of Lenovo at <http://www.lenovo.com/>, where the very first thing you will see is an animated banner that says, "Sometimes the best way to win the game is to play together."

The bottom line is that living in the world that we are, the only thing that can be predicted with *any* certainty is that over the next 10 or 20 years changes will happen and it will take forms that we will not expect.

When Bill Gates bought a little DOS program from a virtually unknown company, did he know it would make him the richest man in the world? When a technician working at the Chinese Academy of Science was approached to work in a new government-run company, did he expect that company to eventually have its head office in America?

That's the point. All we can do is work within the decisions we make and try to make the best of them. Some of us will be like Mers Kutt or Tim Paterson, and will actually create something that changes the whole game but will not be able to fully profit from it. Others, like Bill Gates or Steve Jobs, will make a good decision on Monday that will make them very rich, but for the rest of the week make the same stupid decisions that the rest of us make.

No doubt about it, chance and luck play as much of a role in success as do hard work and intelligent choices. However, there are some very broad practices that we can follow that will definitely help to ensure success. When change happens, make it a policy to adapt to that change and to collaborate with others who are taking part in that change, rather than trying to fight with everyone for a top-place position that is generally more of an illusion than a reality.

IBM originally approached Bill Gates to write a version of BASIC for them, not to create MS-DOS. Originally IBM approached Gary Kindall of Digital Research to license them CP/M, but he was so uncooperative they dropped him and then turned to Gates because he was nicer to work with—simple as that. Likewise, when two young hippy-looking kids named Steve Wozniak and Steve Jobs approached a computer store owner by the name of Paul Terrell in 1976 looking to sell a computer they had cooked up in

their garage and called the "Apple I," he could have told them to get lost. Instead he took an order for 50 units, promising to pay cash on delivery, and thus started a whole new industry.

In both cases, the people who had been given an opportunity delivered on what they had promised. Gates, even though he did not have a working DOS, went out and found one, and thus delivered on his promise to IBM. Wozniak and Jobs originally wanted to sell computer kits, but Terrell wanted them fully assembled, so the two lads worked their tails off for a month of late evenings and soldered together every kit that they had.

The bottom line is that you need to act upon every opportunity that comes your way as if it will be the big one that will make you rich beyond your wildest dreams, because you never know if that will happen until you test it out.

For radio monitoring enthusiasts, there are huge opportunities waiting for someone to sit down and define what precisely radio monitoring will be for the next decade simply by making some good decisions and putting a little work behind it. More important, success will occur for that person who is willing to think outside of the old ways of radio monitoring

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and who is willing to work with others in order to make things happen.

Frankly, if you take a look at successful people such as Gates, Wozniak, and Jobs, you discover that a great deal of their success came from the fact that they had developed a network of people who were both business associates and friends. For example, in order to be closer to other software developers, Bill Gates actually moved Microsoft's original offices from New Mexico to Seattle. Wozniak met Jobs while hanging around with an amateur computer group called the "Home-brew Computer Club" in Palo Alto, California.

The point here is that if radio monitoring is going to continue to grow and evolve to its fullest potential, then it is going to have to come from two things. First, manufacturers are going to have to be shown that there is a market for new and innovative products by having people buy them, and if enough people do that, then prices are going to come down significantly. Second, if we are going to get the products we want, they are going to have to be designed by people who understand the market, and for that to happen, we are going to have to encourage a new generation of young people to get involved in the design process.

So, plain and simple, the way in which our interest in radio monitoring is to be best served will be through the encouragement of more young people to get involved. The best way to do this is through helping to organize clubs at the high school and college levels, where radio and computer technology are encouraged to co-develop.

The entire reason why we have our hobby is due to the fact that in 1919 a group of organized amateur radio operators was able to prevent the United States Navy from making illegal the practice of the public monitoring of radio frequencies. Those early hams, under the leadership of Hiram Percy Maxim, were able to lobby Congress to not enact the Navy's legislation by successfully arguing that radio hobbyists had enabled the United States to draw from a pool of experienced radio operators who signed up for service during World War I.

Today we need to encourage the same development of a pool of new technicians, engineers, and hobbyists who are able to bridge the technologies of radios and computers and bring that experience into the decision-making processes of government, the military, and private sectors. The truth today is that if you go to any radio club, radio meet, or radio event in the United States, you'll generally see an

aging group of people. Yet if you go around the world, you'll not necessarily see the same thing in other countries.

If the United States wishes to remain at the forefront of development in the computer and electronic sectors of the new world economy, then it is going to have to start encouraging today's generation of high school students to start looking at new strategies for competing. Yes, jobs are being sourced to other countries, and frankly the quality of work that is being done in places such as China is far from shoddy. However, what the United States still has is the freedom to innovate and develop strategic partnerships among a wide range of groups in order to be successful.

One of the ways that this can be done is by having people like you, readers of *Popular Communications* magazine, offer to be mentors to high school students to help introduce them to radio monitoring. Even offering to sponsor a subscription to this magazine for your local high school's library would be a start, or donating radio equipment for use by the school if it has a radio club (or offer to help them start one).

We have to move beyond thinking that simply "Buying American" is going to have a positive impact upon the economy. Just because there is an American brand name such as IBM on a product does not mean that you are actually dealing with an American company anymore.

The national path to success will be through the development of a new generation of American youth whose skills, knowledge, and attitudes enable them to be adaptive, innovative, and collaborative in the new world economy. The truth is that a convergence of radio electronics and computer skills could be just the ticket for a successful career.

So think about that after reading through my column. I'm not just talking about ways of making your radio work better. I'm trying to point you towards a brand-new technology—one in which several old technologies are converging into one new way of doing things.

Over the next few years something is going to be happening that will be on par with the micro-computer revolution of the late 1970s and early 1980s. It will change our lives once again, and we will wonder how we ever lived without it once it arrives. The trick is going to be being in the right place at the right time in order to take advantage of it. I'm betting that the people who do grab hold of the "next big thing" will be those who are now linking together their radios and computers.

The "computer nerds" of the '70s and '80s have shaped our current world, and through that we have true global communication via the Internet. My prediction is that the next generation of world shapers will be those who understand how to use that ability to communicate to its fullest potential, and that it will come about because computers will lose their cables and become wireless-based using radio technology. Only time will tell if I'm right on that prediction.

Next Month

Next month I'll be looking at some of the computer-compatible radios and their features. I also have coming up some interesting guest columns on how to prevent computer RF from getting into your radio, and will be taking a look at remote control of scanner radios.

Remember, too, that if you wish, e-mail me with any questions you may have at carm_popcomm@hotmail.com. You can also write to me at: Computer Assisted Radio Monitoring PMB 121 – 1623 Military Rd., Niagara Falls, NY 14304-1745. As mentioned before, I cannot answer general questions on computers, but I will be more than happy to help you with any issues raised in the columns.

I have also placed a list of the columns that I have done over the past two years, along with a summary of the content, on the Web. Please note that my personal webpage has moved to a new URL at www3.sympatico.ca/joe_in_ey. On that website I've also included instructions on how to purchase back issues of *Popular Communications*. Remember that I cannot release previously published material due to the fact that *Pop 'Comm* owns the copyright for all of the material. Also remember that I'm interested in any pictures you have of your own computer-assisted monitoring station or stories about how you have built and run it.

Please keep in mind our troops overseas and give them your support. As mentioned previously, the "Any Service Person" mail program has been suspended for security reasons. Refer to the U.S. Department of Defense's official webpage, "Defend America." They have a specific section found at http://www.defendamerica.mil/support_troops.html which has an amazingly wide range of practical and useful ways in which you can help directly. Please take some time to check out the resources suggested on that webpage and put them to use. See you again next month! ■

On The Bench: RCA 86T6 Notes

Every so often it's time to cull the herd. Most of my radio collection resides in my combination home office, workshop, and ham shack. A set of display shelves along one wall holds the larger radios. One or two radios have found their way to my office at my *real* job. Others are scattered atop any available nearby horizontal surface. Alas, there is only so much room at the inn, and once the radio population overruns the available space, a few sets are turned loose to find new homes.

One radio which recently found a new home¹ is the RCA model 86T6 table radio shown in **Photo A**. The radio, with badly delaminating veneer, was found at a yard sale several years ago. A friend offered to repair and refinish the cabinet, an offer I quickly took him up on!

Fast forward five years later and I find the radio chassis, carefully boxed and stored away, and quite forgotten. A phone call revealed that by coincidence my friend had a cabinet carefully boxed and stored away, and just as forgotten. Within two weeks the cabinet restoration was completed and the radio and chassis reunited. At this point, my total investment is over \$100 dollars for what is normally a \$75 radio.

Anyway, my experiences with the 86T6 restoration turned up a few interesting restoration topics for this month's offering, so let's begin.

Mechanical Restoration

The RCA 86T6 covers the AM broadcast band and shortwave bands. The band switch, via a mechanical linkage, operates a shutter-like indicator behind the tuning dial to show which band is selected. **Photo B** shows the original linkage arm that was mounted on the bandswitch shaft. The arm, made of either pot metal or cast aluminum, was crumbling and couldn't be fastened to the shaft. This isn't a common chassis, and it was unlikely that I would be able to find a donor chassis or anyone who made a reproduction part.

Time to improvise! I remembered how Bob Ryan used a brass insert salvaged from a plastic knob to mount a dial pointer on his homebrew radio receiver, as featured in our February column. Lacking a sacrificial knob, you'll find suitable quarter-inch metal collets, with setscrews, available in most hardware stores. **Photo C** shows how one was adapted and mounted on the bandswitch shaft. The arm was cut from a large safety pin and was inserted in a small hole drilled through the wall of the metal collet. Superglue or epoxy can be used to keep it in place. The original fabric drive belt was replaced with square rubber belting from Radio Daze.² The belting was cut to fit, and the ends were butt-welded together using superglue adhesive.

Electrical Problems

The chassis work was time consuming. This RCA had a lot of rubber-insulated wiring that was rotting away and needed to be replaced. **Photo D** shows the restored chassis after the capacitors, out-of-spec resistors, and bad wiring were replaced.

It was time to slowly power up the radio with my Heath IP-5220 variable AC supply. I watched the AC current meter for



Photo A. The 86T6 RCA table radio restored and ready for a new home. It was sold in two days thanks to its strong art deco features.



Photo B. The original pot metal linkage arm for the shutter indicator had broken and could not be repaired.

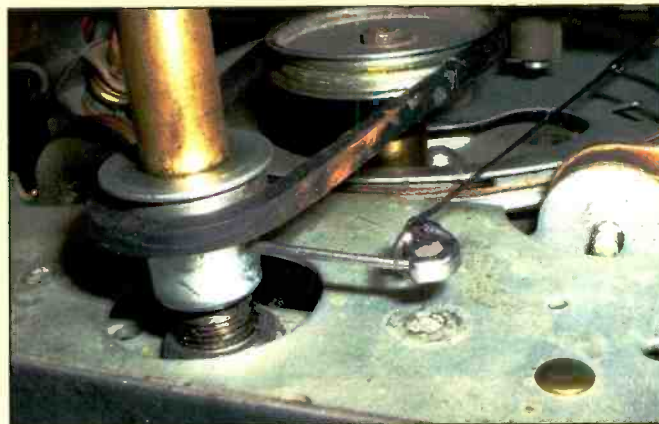


Photo C. A new linkage arm was improvised from a metal collet and a section cut from a safety pin. Necessity is the mother of invention!

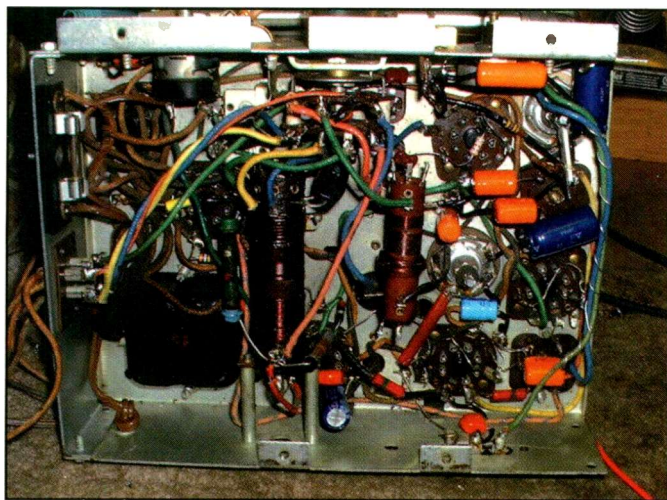


Photo D. The restored RCA chassis. All of the old wax capacitors and out-of-spec resistors were replaced. Rotted rubber-insulated wire was also replaced with new cloth-insulated wire.

any unexpected problems as the voltage was slowly increased to 115 VAC. Everything looked good! The next step was to align the IF stages, which also went well.

Now it was on to the AM and shortwave band alignment! Here's where things started going awry. The AM band went dead above 1200 kHz. The problem was traced to the local oscillator dying off at the higher frequencies. The shop oscilloscope showed the oscillator waveform would slowly drop off, and finally completely stop oscillating, as the radio was tuned to and above 1200 kHz. The usual culprit would be a weak converter tube, yet two other 6A8 tubes produced the same symptoms.

Next all of the new parts and wiring were checked and rechecked for obvious errors. No mistakes were found. It was time to go back to the schematic and look for some clues to solve this mystery. The radio uses a fairly complicated bandswitch scheme, which involved some time-consuming con-

tinuity tests to check for open oscillator coil windings or defective bandswitch contacts.

Mystery Solved!

I accidentally stumbled upon the solution. Going back to the schematic, I noticed the oscillator coil was bypassed with a 10-mF electrolytic capacitor (C12 on the Rider schematic), and I discovered that I had missed this capacitor while restoring the chassis (see **Figure 1**). The capacitor bypassed the "cold" end of the feedback windings on the different oscillator coils for each band. If this capacitor failed open, or had a high ESR (Equivalent Series Resistances), the feedback wouldn't be strong enough to sustain oscillation. I bridged the defective electrolytic capacitor with a new .1-mF Mylar capacitor, and the radio sprang to life across the band. Success!

Replacing the electrolytic capacitor solved the problem. However, I went one step further by bridging the new 10-mF electrolytic capacitor with a .1-mF Mylar, as shown in **Photo E**. My ESR meter showed that even a .1-mF Mylar capacitor had a much lower ESR (making it a better bypass) than a new 10-mF electrolytic capacitor at high frequencies.

Improving RF Bypassing

There are several reasons for doing this part. First, electrolytic capacitors are intended for power-supply filtering and decoupling between low frequency stages; they aren't ideally suited for RF bypassing. They have higher ESRs (equivalent series resistances) compared to a non-polarized Mylar capacitor. (Remember, we discussed ESR and how to measure it in our February column.) Also, they can have considerable internal inductances that also limit their effectiveness as RF bypasses. I'm sure there were good reasons why the RCA engineers used a high-value capacitance here without additional bypassing, reasons most likely related to cost savings, but adding a .1-mF capacitor in parallel is good practice.

Improved Image Rejection

I've often suggested adding a .1- or .22-mF Mylar capacitor across any electrolytic capacitor you might encounter that's also being used to bypass RF. You'll see this a lot in the more inexpensive sets where a few components are doing the work of many. Here are a few reasons why:

1. As the electrolytic ages and dries out, its ESR will slowly rise, and its effectiveness as an RF bypass will steadily decrease.

2. When an electrolytic capacitor is used for RF bypassing, the image rejection and front-end selectivity can be improved by adding the additional Mylar bypasses. Why? The ESR of the electrolytic capacitor will decrease the RF-coil Q, reducing the RF-stage tuning selectivity, and will also contribute to circuit losses, making the radio less sensitive. Coil and capacitor Q are quality figures based on the losses of a capacitor or inductor. In theory, a capacitor or inductor has no resistance, only pure reactance value. In the real world, all components have some DC resistance, and these resistances cause losses. In practice, these losses mean a tuned circuit will not have good image frequency rejection, and if lossy enough it might even affect the radio's sensitivity!

A single-conversion radio—with a 455-kHz IF and a single-tuned RF stage—operating above 8 MHz requires a very efficient

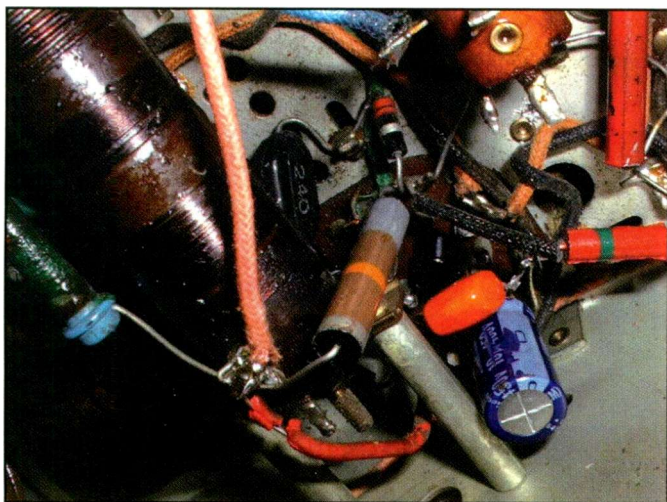


Photo E. The 10-mF electrolytic capacitor (part C12) was paralleled with an additional .1-mF Mylar capacitor to improve RF bypassing. The electrolytic capacitor (blue case) and the Mylar capacitor (Orange-Drop package) are located near the rear apron of the chassis (bottom of photo).

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RSGB, 2nd Ed, 1996. 160 pages.

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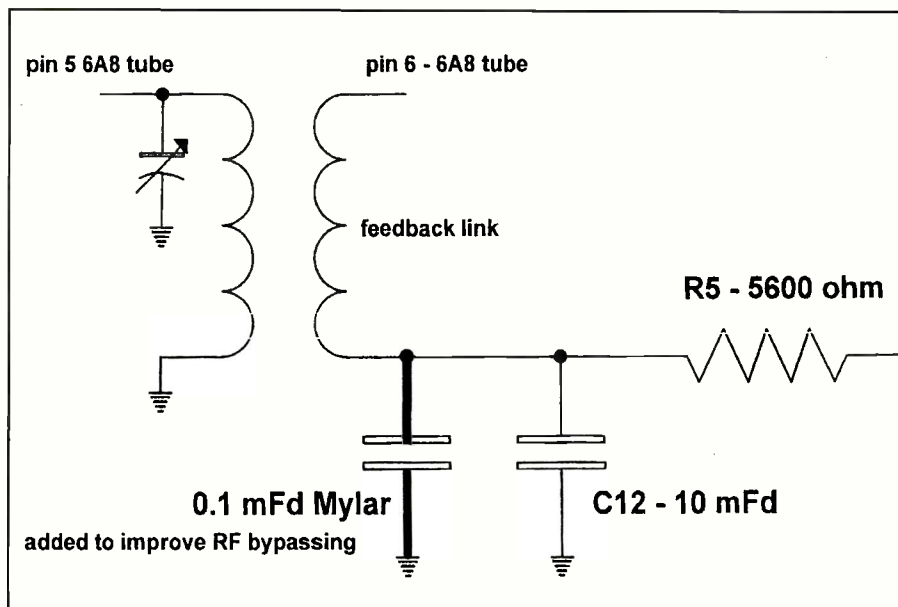


Figure 1. Abridged oscillator circuit for the 86T6 converter stage. Bypassing capacitor C12 with a .1-mF Mylar capacitor ensures continued good RF bypassing as the electrolytic ages and its ESR rises.

tuned circuit. Otherwise, strong signals 910 kHz away on the image frequency can cause problems. Bypass capacitors having any measurable ESR will act the same as

placing a resistor across, or in series with, the resonating components for the RF stage being bypassed!

We will talk some more about Q and

how to measure it in future columns, so stay tuned!

The 86T6 Finds A Home

The 86T6 was declared fit for service, bench tested for several days, and then offered on the RadioAttic website. Between what I paid for the radio, cabinet repairs, restoration materials, and the advertising fee, my net profit was about \$25—not bad for several years' effort! But we do this for fun, right?

Until next month, keep those soldering irons warm and keep you're letters, photos, comments, and suggestions coming in. I can be reached at "The Wireless Connection," *Popular Communications*, 25 Newbridge Road, Hicksville, NY 11801, or via e-mail at radioconnection@juno.com.

References

1. Wireless Connection radios that become available for adoption are offered on the RadioAttic website; you can find the RadioAttic at: www.radioattic.com.

2. You'll find the Radio Daze website at this URL: www.radiodaze.com; or call or write to Radio Daze LLC, 7620 Omnitel Place, Victor, NY 14564 (tel. 585-742-2020). ■

InfoCentral (from page 5)

celled their year-end vacations when the tsunamis struck and volunteered to carry phoned-in messages on special broadcasts. The messages came from some of the 12,000 survivors living in makeshift camps or from their frantic relatives in mainland India.

The AIR shortwave transmitter is located at Brookshabad, south of Port Blair, and uses 4760 and 7115 kHz.

Voice Of Tigers Broadcast Live On Web

VoT Radio—Voice of Tigers, the mouthpiece of the Tamil rebels fighting for independence in north and east Sri Lanka, has now started to broadcast live on the Web. The station, which recently celebrated 15 years on the air, primarily gives the rebels' version of their fight against the Sri Lankan government. You can listen to the station live on its website at <http://www.pulikalinkural.com/> (in Tamil, "pulikalinkural" means "voice of tigers").

RFE/RL Will Use Current Building For Two More Years

Radio Free Europe/Radio Liberty (RFE/RL) will use the building of the former Czechoslovak parliament in the center of Prague until the end of 2007, after which it is expected to move to another building. It has not yet been decided where precisely the radio station will be located after 2007. The station, financed by the United States, broadcasts in several languages to countries in which freedom of the press is not

observed. Discussions concerning its resettlement from the center of Prague began following terrorist attacks on the United States in September 2001. Since that time, increased security measures around the building have been in force, including being guarded by several armored vehicles for some time.

And The Survey Says...High Listening Rate For U.S.-Funded Radio In Afghanistan

Nearly two-thirds of Afghan radio listeners are tuning in to Radio Free Afghanistan, according to the results of a new survey conducted for RFE/RL by the Broadcasting Board of Governors. The survey showed a nationwide weekly listening rate of 61.6 percent to RFE/RL's Radio Free Afghanistan broadcasts in Dari and Pashto, rising to 70 percent in the capital city of Kabul. When asked about the reliability of the news and information broadcasts, strong majorities in the survey considered RFA and Voice of America (VOA) to be trustworthy. Asked about general issues, 54 percent said they are favorably inclined toward the United States, 64 percent said things in Afghanistan are headed in the right direction, and when asked to name the first thing that comes to mind when speaking of the United States, 40 percent said U.S. support for reconstruction of Afghanistan.

RFE/RL's Radio Free Afghanistan and the VOA broadcast on a 24-hour single stream in Afghanistan. RFA provides local news and VOA supplies news about events around the world. The U.S. Congress appropriated funding to create Radio Free Afghanistan in December 2001 as part of an effort to build a peaceful and democratic Afghanistan following the successful U.S.-led strike against the Taliban. ■

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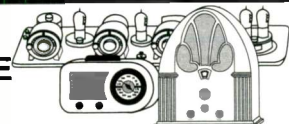
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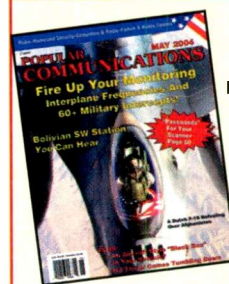
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Slip-Slidin' Away

It was a dark and stormy night. No, really . . . I'd never make up an opening line like that. My associate, Dave, had volunteered to run our television uplink on this particular night; he volunteered long before we knew it would snow and freeze and be generally miserable.

His problems, he told me, started when he arrived at the uplink and slipped on the hill leading down to the chain-link fence. All of us slip on that hill, and someday someone's going to get hurt. Come to think of it, someone already has—the boss. I think that's why he doesn't come around the uplink very often.

The uplink, for those 97 percent of you who don't know, is a place where microwave television feeds come into a building on fiber-optic cables and then are routed into a modulator, upconverter, and other interesting high-tech gadgets until the signal passes through an HPA (high-powered amplifier) and is squirted toward the heavens some 23,000 miles to hit a satellite which is orbiting (wow, I love using all this high-tech talk!) in a geo-stationary path (that means it stays directly above the same place on Earth all the time) so that we can hit it with our television signal. The signal then comes back to Earth on another frequency, to be received, taped, and later broadcast by one or more television stations. When we're not doing this, we often watch the early feed of *Jeopardy!* so that we can amaze our wives later that night by knowing all the answers to even the most obscure questions.

This particular uplink was nothing earthshaking—just a 15-minute feed of some college basketball highlights for the 11 o'clock news on a few channels within our state. However, it was important, as all uplinks are, because many people depend on using the feed in their sports highlights, and all the team members and their parents, coaches, and alumni eagerly await seeing themselves and their loved ones on television. Thus, it is imperative that “the show must go on.”

Dave has been running these uplinks even longer than I have, and he's quite competent. He has his own keys to the chain-link fence and the small building. After he said what might be construed as a brief prayer, he got up from the snow, brushed himself off, and dug out his keys.

The fence lock was frozen . . . completely frozen . . . filled with ice from keyhole to shackle.

Dave does not smoke. Most people today don't smoke and therefore don't carry lighters or matches, or any source of heat besides their bodies, which won't thaw a lock quickly enough anyway. Dave doesn't even have a cigarette lighter in his car. In his panic, he saw a police officer pass by, flagged him down, and then climbed back up the slippery hill to the waiting police car. He had no lighter or matches either (although later we all remembered that police officers carry road flares in the trunk of their car, but no one thought of that). However, he offered the cigarette lighter from the dashboard of the cruiser.

Dave heated the lock with the lighter, and when the lock

popped, he ran back down the hill toward the fence to get there before the thing cooled. He might have made it, too, if he hadn't fallen and let the lighter fly into a snow pile. He retrieved it, took it back up the hill to the cruiser, heated it again, and this time wrapped it in his handkerchief to keep it from cooling down so quickly. The handkerchief caught fire (you saw that coming, didn't you?), and when it did, he dropped the whole thing—again—into the snow.

For the third attempt, he rolled a piece of newspaper into a narrow tube, lit it once the lighter heated again, and blew through it, keeping the end glowing. This time he didn't fall in the snow and stood there like a fool, blowing through a glowing newspaper tube into the keyhole of a padlock. It cast a nice glow on the gate latch, and surprisingly, it melted the ice enough so that he could get the gate open. Our officer friend gave a little toot on the horn and left. Dave got into the uplink and got his feed up to the “bird” in time. As the hoopsters ran back and forth on the court, Dave put the padlock in our toaster oven (refer to last month's “Cooking with Kleins” to see how we use that) and dried out the lock just beautifully. We are nothing if not ingenious . . . or igneous. It's hard to remember which.

When Dave told me later how nicely the toaster oven thaws locks, I told him I'd only done bagels in it. He was not amused.

More recently we had occasion to “uplink” a well-known, “love him or hate him” politician. In this type of instance we are not the primary uplink, but we act as a backup in case one of the big network uplinks fails. At the same time, the TV stations receive the signal on several transponders from the satellite and only have to switch to another feed if one drops out.

As I sat watching the monitor, I began to type things across the bottom of the screen (just on my own monitor, not on the signal going toward the satellite). I wished I had a device that would generate the “pop-up-video” thought clouds over my politician's head, the way some of the music video channels do. As I typed under the man's chin, I began to be more vitriolic in the words I chose, until I was downright slanderous. Then I panicked just for a moment. I thought that my typing might be going out “on the air,” so I checked the return monitor and was relieved that it wasn't. I had only to press the “take” button to make that happen, though, and for a brief moment, I wondered just how badly I wanted to keep my HPJIE.*

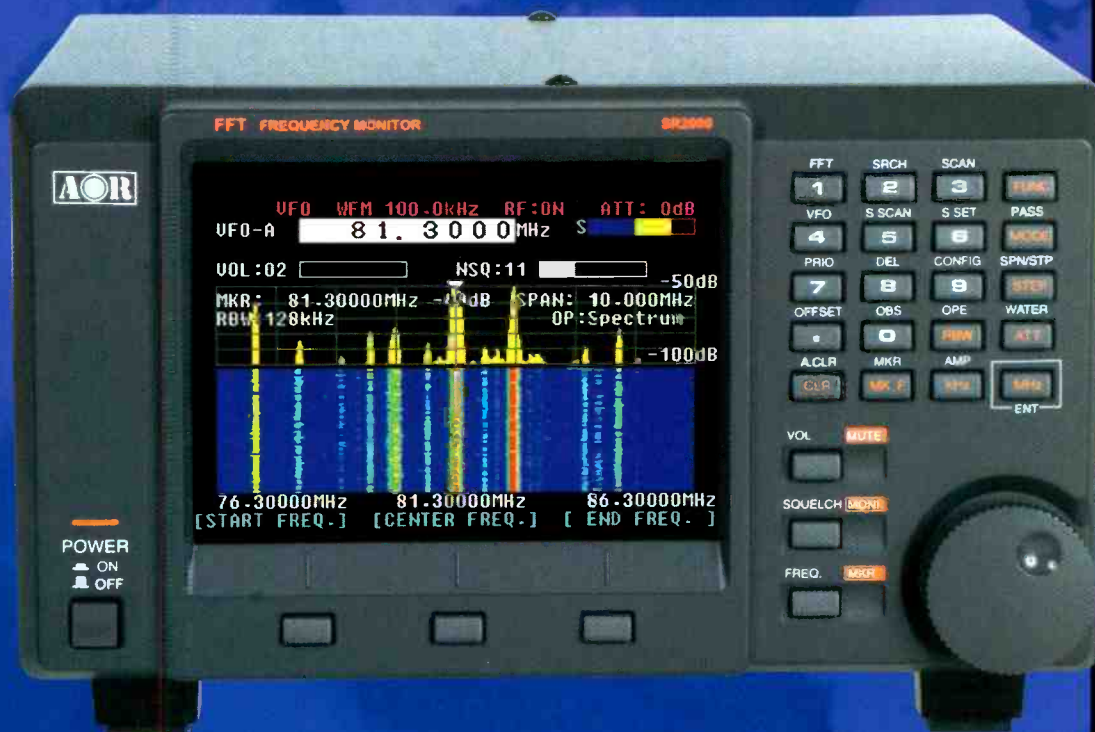
I regained my composure, at least for that moment, and also kept my job.

Dave and I still use our Kleins when cooking at the uplink, and even for work now and then, as well. We've put a lockbox next to the gate with a propane torch inside. Yes, it's locked. No, I wasn't thinking of that when I installed it. Dave and I now carry disposable lighters during the winter months. ■

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