DXpedition of a Lifetime Easter Island

In this issue:

- Roundup of SW Programming
- Amateur Radio in the Classroom
- Back to Scanner School
- Model Motors from Scrap

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Lead Story

DXpedition to Easter Island
By John Bryant

When John Bryant planned a trip to Easter Island, he knew he was fulfilling a life-long dream, but little did he know he was also preparing for what would turn out to be "the most memorable DXpedition of [his] long career."

Bryant logged 235 different stations, 40 countries, and all continents except Antarctica. Not impressed? You will be when I tell you he performed this feat on MEDIUMWAVE!

Bryant's stunning results are accompanied by equally stunning photography by Bob Bollinger. All photos, including our cover shot of Anakena Beach where Polynesian immigrants first landed over 1500 years ago, are by Bollinger. On the right: Sunset profiles Rano Raraku volcano and fifteen "moai" ancestor-figure statues.

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Eric Bryan, who is usually found reviewing "poor man's portables" in the pages of *MT*, decided to get out of a listening rut. We all tend to get stuck listening to what is easiest, or already programmed in the radio, or to the countries that most interest us. But what else might we be missing? Eric conducted an informal "bandscan" of the shortwave bands and compiled a sampler of the programming he found. The results prove his point: if you haven't been tuning around, you've missed some delightful surprises!

A common belief is that today's kids are not attracted to amateur radio, but the ARRL's "Big Project" proves that's not so. 222 Big Project schools are introducing thousands of students to wireless technology this year, and many more schools or individual teachers sponsor radio programs on their own. Reitz introduces us to just five of these schools and their active radio clubs.

Don't worry; the kids are alright. See if there's a Big Project school near you: If there's not, why not apply to start one?

Reviews

In our continuing series of digital HD radio reviews, we check out the CAMBRIDGE SOUNDWORKS 820HD AM/FM/HD RADIO RECEIVER. With minimal design and maximum sound, Ken Reitz says the 820HD is unequaled for audio quality (see page 69).

Two of MFJ ENTERPRISES' antenna solutions for the apartment-dwelling ham or SW listener are the 1623 and 1622 window or balcony-mount antenna. Ken Reitz puts them through their paces on page 70. Also, John Figliozzi introduces *MT* readers to the just-announced TIVOLI AUDIO NetWorks and NetWorksGo internet radios, on page 71.

Did you know your PC can be a digital audio recorder? With the help of recording software, you can archive audio for future enjoyment, logging, or QSLing. John Catalano reviews RecAll Pro, Scancorder, Sound Recorder, Snooper, and Audacity (see page 72).

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LETTERS
TO THE EDITOR

Going to Great Lengths

John Musgrave, of Oona River in Northern British Columbia, recently put together a small kit for mobile, wideband monitoring. His traveling kit includes an AOR AR8200-III, 120vac wall wart, 12vdc cigarette plug and cord, Hamtronics LNK wideband preamp, 9 vdc battery, and telescoping antenna, and a UHF/BNC adapter fit snuggly in a Pelican 1060 micro-case. "Light headphones and a 30ft wire antenna with a banana plug (also 3ft RG58 with BNCs) terminal carried separately complete the kit. The Pelican case slides into a large pocket."

John uses the kit for waterproof listening while in the garden or on his sailboat on the Oona River, but he also took it with him on a rare trip to Vancouver (which involves travel by a combination of plane, train, bus, and ferry). He says his attaché case included the 8200 kit, a Geiger counter, a small GPS set, an MFJ886 frequency counter, an Alphalabs field strength meter, and a camera.

While in the garden John monitored two pilots from Hawkair discussing a new stewardess. "She's an ex-model; used to model underwear. They waited 'til they were out of range of Terrace/PR as they were using the 'company freq.'" Using the wire antenna, he also received "the B.C. Public Service Net (3727 LSB). Net controller was on Saltspring Island with hams from BC, WA, and Alberta being heard."

John also comments that "These sets (AOR AR8200 and AR8600) thrive on discone antennas, which, being inefficient below 25 MHz (with vertical frequency extender), don't overload them. At my base set-up I use the 8200 from 530 kHz up. Can occasionally receive such toughies as R. Sondergrense 3320 and Oz N Territories on 2310, 2325, 2485 kHz.

"I've received Sondergrense and the N Territories well with the 8200/preamp/Shakespeare antenna from my boat in the past week. Bear in mind that my radio rx environment is very 'clear.' No QRM at all – unless it's from my hydro-plant/load controller when operating. Plus I've salt-water grounds!"

Even Further – Up!

On May 9th, says John, "I took my '8200 kit' to tree-top (70 ft at least, probably 90) plus a camera 35mm with 35mm lens, and set up a monitoring post. Went out on a limb and took a couple of photos. 'Tree Top Monitoring' would make an interesting *MT* article!"

When admitting he got over-fatigued trying to maneuver his boat in ice-busting conditions and gale force winds, John wondered, "Mebbe at 71 I'm getting too old for the life I live!" But, judging by these pictures of his tree-top monitoring, we sure don't think so! (Photos to the right)

Follow-Up on "Northern Adventure"

"The new car ferry *Northern Adventure,* which replaced the sunken *Queen of the North* (see *MT's Boats, Planes and Trains* July 2006 column) is now in service, sort of. She looks sorta cute, which is bad, 'cos cuteness doesn't count out in Hecate Straits. She had the crew which brought her over from Spain very worried off the Oregon coast – she had windows
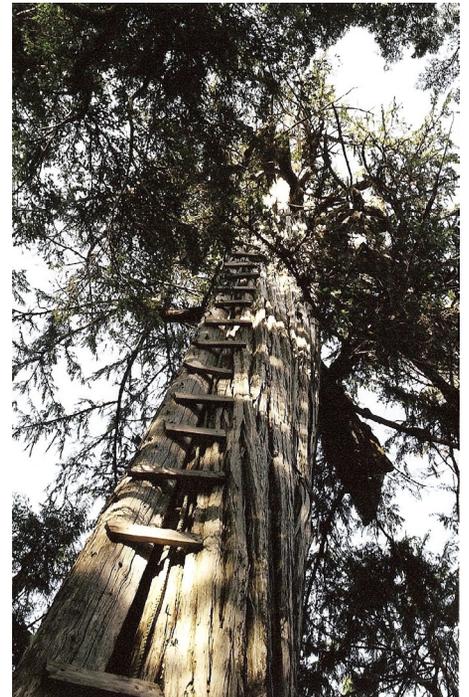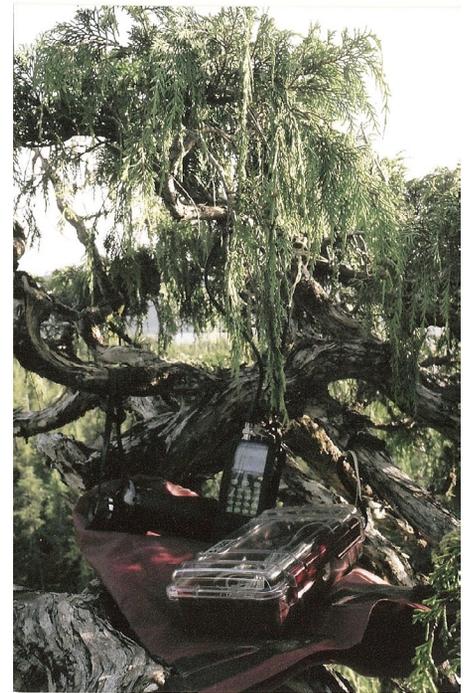
smashed.

"Her first trip from the Queen Charlotte Is, across Hecate Straits to Prince Rupert was a near disaster. She got into 35 knot winds, the windows leaked, passengers got wet and cold (and their money back). A dry fire-extinguisher flew off a bulkhead on the car deck and went off. The fire alarm sounded, which uses the P.A. system, and no one knew how to turn it off. Crew had to rush around reassuring the passengers. Then a waste-water holding tank

flooded into the galley.

"The boat was tied up at Rupert for a couple of days – some crew quit in disgust. The boat got the nickname 'Vomit Truck' laid on her. Not a good start. (Calling a boat a truck is a great insult.)

"I called BC Ferries to find out when the next ferry South from Rupert was. A lady told me, 'Friday the 13th leaving at 1300 hours.' I told her I'd better bring my floater (survival) suit along! Which broke her up!

"*Northern Adventure* ended up going into the dock for a re-fit on May 10. Her first trip was April 1st!"

John Musgrave, Oona River, BC

Monitoring Sea-Tac

In the July *Letters*, another reader from British Columbia mentioned monitoring Seattle International Airport (Sea-Tac) even though he lives about 200 miles distant. Ben Dawson sent this observation:

Antenna site atop Gil Island (Musgrave)

"Mr. 'George' from Saltspring Island (Colombie Britannique) could probably explain his easy monitoring of various Sea-Tac communications if he realized that he is not nearly as distant as he assumes. The most distant point of Saltspring island is only 120 miles (189 km) from the Sea-Tac reference coordinates. Isabella Point, the most southeasterly part of Saltspring, is only about 103 miles from Sea-Tac. And, of course, some of the repeater sites he evidently monitors are either elevated well above sea level (as is Sea-Tac itself, about 106 M runway elevation) or further north.

"Southwest British Columbia and the Puget Sound region of Washington State are among the most difficult places in N. America for frequency allotment and coordination from MF through microwave because of the plethora of elevated sites which can see into the "opposite" country at VHF, UHF and above, and the extensive salt-water paths which result in good MF propagation as well as dandy inversion conditions at microwave frequencies.

"An exciting place to practice telecommunications engineering!"

Ben Dawson, P.E.
Hatfield & Dawson Consulting Engineers

Belated Footnotes

*   Reference Skip Arey's *On the Ham Bands*

July column:

"While enjoying your 'Green Shack' column, I came upon that World War II conservation slogan you quoted. Somehow your ending 'make do' didn't sound right and – being a little older than you – the real ending soon jumped into my mind – probably for the first time in a few decades!"

Use it up, wear it out
Make it do or do without.
Marc Ellis, Radio Restorations

*   Your editor was puzzled by Fred Waterer's reference to "those Peanuts in the Godzilla movies" in his August *Programming Spotlight* column. Fred clarified:

"They were Japanese pop singers, who appeared in a number of the Mothra and Godzilla films. In the films they were tiny fairy-like people (one website calls them priestesses of Mothra) who knew how to appeal to his goodness :-)

"Usually there is a subplot where some greedy guy decides to capture them in a box or suitcase and profit somehow. An appropriate Lizard or human hero then saves them. Pretty silly plotlines, but then it is about a monster who regularly stomps all over Tokyo.

"Brian Smith dug up some of their (legitimate) music a while back; it's actually not bad."

www.godzillamonstermusic.com/ godzilla17.htm

Fred Waterer, Programming Spotlight

COMMUNICATIONS

False Alarm

As we reported in August, a nationwide upgrade of the Emergency Alert System (EAS) is being installed by the Federal Communications Commission, along with the Federal Emergency Management Agency, the National Weather Service and the individual states. However, on June 27, morning drive-time listeners in northwestern Illinois were startled when every station was either tuned to WGN-AM 720 with morning man Spike O'Dell or was emitting the EAS tone for minutes at a time.

MT has read two explanations. Initially it was thought that equipment in Springfield was being tested and inadvertently went live. The later explanation is that a FEMA contractor was performing a closed-circuit test between Cleveland, Ohio, and Richmond, Virginia, but the Illinois system picked it up because of a new satellite receiver that had been an improperly installed the previous day.

We can only hope that as more updated systems go on line, these installations become more routine!

Hams Part of Emergency Planning

Sgt. Tim Lotspeich of the Barstow, California, sheriff station, himself a licensed ham, watched events unfold in Katrina's wake and decided to incorporate ham radio into a new emergency-communication program in the High Desert.

"Amateur radio, at least for the first couple of days, was the only reliable communication," Lotspeich said of the Katrina disaster. "In the event of an emergency, we're really going to rely on volunteers with the proper license."

Lotspeich is recruiting Barstow amateur radio operators to volunteer as part of a emergency-communication system. He said if the sheriff's regular radio system, dependent on mountain top repeater sites across the desert, were to go down, shortwave, UHF and VHF radios would be the only way to communicate between the Trona, Baker and Barstow stations. Volunteers are needed to operate the radios, relaying and receiving communications, while the sheriff's deputies assist with the emergency on the ground.

Federal Court Denies Webcaster Appeal

MT has continued to follow the webcasters versus copyright royalties debate with interest as it takes on all the drama of a *High Noon* showdown. First, new rates were estab-

lished (to take effect May 15) but webcasters – especially the small and non-profits – said the rates would put them out of business. Webcasters appealed to the Copyright Arbitration Royalty Panel and lost. They appealed to Congress and staged a "day of silence" to enlist the aid of the public. They appealed to the U.S. Court of Appeals for the District of Columbia Circuit and lost. Their temporary stay expired July 15.

Are they now off the air? No, because SoundExchange, which represents musicians and performers, offered to extend the old rates until an agreement can be worked out and has agreed to a $50,000 cap on per-channel fees. Orchestrating negotiations between the coalition of webcasters and the musicians' representatives is none other than Rep. Edward Markey who holds Bill Tauzin's former spot as chairman of the Telecommunications and Internet Sub-committee.

Now, however, it appears there were some sticky "strings" attached to the reprieve. This new facet of "radio" continues to evolve!

Broadcast Detachment Transfers AFN Command

The 356th Broadcast Operations Detachment from Fort Meade, Md., arrived in Kuwait July 12, 2006, and spent the year operating the American Forces Network station in Baghdad. While there, members of the 356th broadcast more than 3,500 hours of live radio and filmed 250 episodes of *Freedom Journal Iraq*.

On July 2, 2007, command of AFN Iraq was turned over to a detachment of U.S. airmen partnered with a detachment of U.S. sailors, the Defense Department reported.

After more than 100 missions outside the International Zone, we know these members of the National Guard are glad to be back home!

A First, Even for Russia

During the 1990s, a lot of infrastructure and land was privatized in the Russian Federation. However, the federal government is now trying to reverse the trend by consolidating the assets of several government agencies.

In Bashkiria, a Russian Republic north of Mongolia, the Russian TV-Radio-Broadcasting Network (RTRS) is in dispute with Bashinformsvyaz (a major telephone/Internet/data operator in Bashkiria) over a broadcasting complex in Ufa. RTRS is trying to reclaim a broadcasting complex which, according to the Russian president's decree, was to have passed back to the federal agency in 2001.

Though the case is still in court, Bashinformsvyaz took the unusual step of ordering four 200-meter-high radio broadcasting towers on the property blown up. One legal consultant said, "Blowing up the infrastructure elements is an unprecedented-for-Russia but perhaps effective way to change the status of a real estate object: in this case – from the status of a building and a broadcasting facility to a common land plot."

The RV-1 broadcasting complex included radio transmitters (earlier used by Radio Rossii and Mayak), the four blown-up towers, several buildings, and a land plot of 70 hectares. Although Bashinformsvyaz has won part of the property dispute, one expert predicted that, "Ahead of the 2008 presidential election, the state will definitely try not to allow Russia's broadcasting infrastructure to de-centralize. Thus, the state might take RTRS' side in the dispute."

Build a Better Battery

The Pentagon is offering $1 million to any team that can cut the weight of batteries carried by US soldiers in combat from more than 20 pounds to 4 kilograms (8.8 pounds) or less. The wearable power system must provide 20 watts or power over 96 hours. The competition, dubbed a "wear off," will take place in the fall of 2008.

Lady Bird, Radio Owner

The former First Lady, widow of Lyndon Johnson, passed away July 11 at age 94. Lady Bird was also involved in the world of radio thanks to her purchase in 1942 of KTBC(AM) in Austin, with part of her inheritance, the *New York Times* reports in its obituary.

"Although the station was bought in Mrs. Johnson's name, her husband's political influence, even though limited at the time, helped in acquiring the license from the FCC," the *Times* recounted. "Johnson became the commission's champion at a time when Congress was about to cut its budget. Mrs. Johnson's application was speedily approved."

Incidentally, Lady Bird Johnson was protected by the United States Secret Service for forty-four years, longer than anyone else in history.

Jean Marius Novi WB4ENI

Jean Marius Novi was one of the hams who provided vital emergency communications after Air Florida Flight 90 crashed into the 14th Street Bridge on Jan. 13, 1982, during a bitter snowstorm. Mr. Novi was cited for the four days in which he assisted in engineering a phone patch and volunteering services and equipment.

Ham radio was only one field in which he was involved in communications and international understanding. Mr. Novi worked as an interpreter of English, French, Spanish, Portuguese and Italian. His assignments took him to conferences, boardrooms and governmental organizations worldwide. He dealt with a range of subjects, including finance and business, medicine and health, energy and engineering, and arts and literature. Novi organized French interpreters for three Olympics and for 6 years was involved in the International Criminal Tribunal for the former Yugoslavia in The Hague.

Novi died at age 62 of sepsis June 19 at Georgetown University Hospital.

Prime Time Shortwave

Daniel Sampson, owner of Prime Time shortwave, has announced he will discontinue the English shortwave schedules database as of the fall-winter broadcasting season, October 28.

Schedules will continue to be posted at the Prime Time Shortwave website after the A-07 season, but they will not be entered in a database, nor will they be as comprehensive. The newsletter will be continued, but not the ascii text files.

"I have been doing the shortwave schedules database for something like 22 years," says Sampson. "As for why I am discontinuing doing the database, increasing responsibilities with the family, church council, committees, other website work, being a land owner, and my full-time job are getting to be too great. It's making it difficult for me to keep up the quality work on it that I feel is necessary."

Maintaining a database is truly a labor of love – often a thankless one. So, we'd like to take this opportunity to thank you, Daniel, on behalf of the hobby. *Newsbreak:* In a last-minute reprieve, Ernest Riley, who writes for the Ontario DX Association publication Listening In, has volunteered to take over operation of Primetime Shortwave. Great news!

Monitoring Times is grateful for the co-operation between Prime Time and our own database manager, Gayle Van Horn (who has been managing *MT's SW Guide* for a "mere" 14 years). *Monitoring Times* is now nearly unique in maintaining a regularly-updated shortwave database file of English language broadcasts.

Medium Wave DXpedition to Easter Island

By John H. Bryant
All photos by Bob Bollinger, Stillwater, OK

In an attempt to assure DXing success, Author John Bryant and photographer Bob Bollinger put on hiking headlamps and scaled the Rano Raraku volcanic cone. Rano Raraku is also the site of the quarry for all but a few of the giant moai heads for which Easter Island is known.

R ecently, I was able to fulfill a lifelong dream and visit fabled Easter Island in the southeastern Pacific. Although my primary purpose was to visit the myriad of archeological sites, view the hundreds of giant stone heads, and get to know the inhabitants of this "most isolated community in the world," I could not possibly visit such an exotic location without testing its potential as a location for very long-range *medium wave* DXing. Since the nearest concentrations of MW broadcasters to Easter Island were on the west coast of South America, 2300 miles to the east, and in New Zealand, 4300 miles to the southwest, there was every likelihood that Easter Island might be a prime DX location.

Easter Island, a special political component of Chile, is a triangular volcanic island measuring about ten miles on a side. The 3300 inhabitants are concentrated in a single village, Hangaroa, on the southwest corner of the island, which is also the only location of an AC power grid on the island. Getting to Easter Island is now relatively easy: an overnight flight from the USA to Santiago, Chile, followed by a 5-hour jet flight straight out into the otherwise empty eastern reaches of the South Pacific Ocean.

Even though Easter Island lies so far west off the coast of South America, it was a real surprise to discover that the island is on what we Norte Americanos know as Mountain Standard Time! We tend to think of our continent as being stacked directly atop South America, but an examination of a globe reveals that the western coast of South America is offset to our east over 2000 miles! Travelers from the USA suffer no classic jetlag at all, but 24 hours of continuous flights and airports can still be quite brutal.

Planning

As I planned the trip, I knew that I would be 12 volt DXing from a rental car. Since I was also quite concerned about luggage weight and passing through modern security screening, my DXing equipment choices were both critical and limited. After a good deal of thought, I chose the marvelous Eton E1-XM as my primary receiver and the small Kaito KA1103 as back-up; the Eton E1-XM had recently supplanted my long cherished Sony 2010 as my favorite DXing portable. I was not disappointed in either receiver!

In my many years of seaside DXing, I've never found an antenna that performed as well as a Beverage, so I selected two 500-foot wires as my antennas; weight and bulk concerns led me to adopt the Beverage-On-the-Ground (BOG) configuration and a very light 28-gauge, Teflon-coated wire. I was concerned about the BOG configuration and using such tiny wire; but again, I was not disappointed.

The DX travel kit was rounded out with my favorite full-size headphones, a magnificent Edirol R-09 digital audio recorder and my trusty *WRTH* (*World Radio TV Handbook*).

As I planned the DXpedition, I anticipated hearing quite a few coastal South American stations from an Easter Island location; I also expected to hear a decent number of New Zealand broadcasters mixing with a few of the stronger Australians. I also eagerly anticipated hearing a number of stations from the island

Ahu Tongariki with its ancestor-figure moai statues is a careful restoration of the largest and most populated ahu ever created by the ancient Polynesian inhabitants of Easter Island. Finished moai statues did not look out to sea as is the popular Western misconception. They were mounted on ahu platforms at the edge of the sea and gazed inland to overlook the nearby village of their descendants.

nations of the Pacific.

Since my friend, well-known South American DXer Rocco Cotroneo, had recently heard several of the largest Japanese MW stations from the Chilean coast, I, too, hoped to hear the biggest of the NHK stations, from twice as far away as from my favorite haunts at Grayland, WA, USA.

The Challenge

The distances involved in Pacific-based DXing are enormous. With the 2,400 mile width of the USA in mind, the distances from Easter Island to anywhere else are simply staggering: it is 2,300 miles to Chile, 4,300 miles to New Zealand and 5,300 miles to the nearest edge of Australia. Most of the US, including the Hawaiian Islands, is about as distant as eastern Australia: 5,300 miles.

These are the "close-in" locations; beyond them, distances get truly planetary: Western Europe and Japan are about 8,500 miles away, while coastal China lays out at 9,500. To go beyond that distance at MW frequencies is simply unthinkable.

I planned my two-week stay on the Island to include four all-night DX sessions on the local Friday and Saturday nights, with one three-hour, early evening introductory session ahead of the first weekend and two similar sunset DX sessions during the intervening week. That schedule proved very workable and was followed closely.

My DX shack turned out to be a small Japanese SUV, ruggedized and adapted to the rutted and rock-strewn gullies that are laughably called "main roads" outside of Hangaroa village.

My location on the island, except for the first familiarization session, was near the Te Peu archeological site on the upper portion of the northwest shore. This was as far north of Hangaroa (about 6 miles) as the "road" ran. Since none of the more popular archeological sites were nearby and the road was so poor, the site was about as isolated – both electrically and physically – as possible.

The spot that I chose was on a plateau atop a 200 foot northwest-facing cliff, looking out across the broad Pacific into quite magnificent sunsets. I ran one antenna due west, unterminated, directly to the cliff, 480 feet away. That antenna was used, directly, for all Pacific DX and used "over the shoulder" for South America. The second BOG ran due north, pointing at Central and North America.

Early Results

The DX during my first familiarization evening session was about what I expected: I started at 0039 UTC, almost an hour before local sunset, and I found the MW dial covered with either carriers or audio from South America. The only surprise that evening was from how far north many of the signals were

coming: my first logged station was Radio Programmas del Peru-730 kHz, Lima, that was just booming in almost an hour before the sun dipped into the South Pacific. That logging was closely followed by Radio San Francisco-850 kHz Guayaquil, Ecuador, practically off the side of my E-W Beverage, booming in as well. The rest of that evening followed suit.

By sunset, there was what seemed to be South American audio on almost every channel from 540 to 1700 kHz. I logged a number of Argentine stations, especially above 1600 kHz, and what seemed to be every station on the air in either Lima or Guayaquil.

During my pre-trip research, I had noted that almost the entire island was "open range," with semi-domesticated animals wandering about freely, even in the village of Hangaroa.

It seemed kind of pleasant during that first evening of DXing to notice beautiful roosters and hens pecking their way past the DX truck in the gathering twilight. They were direct descendants of Polynesian fowl brought in the ocean-spanning canoes with the original colonists 1500 years ago. Charming!

It also seemed somehow rustically appropriate when a herd of 18 to 20 horses, introduced over 100 years ago by Chilean ranchers, came wandering down the main "road" past the DX site, just before full dark. At that point, I did not anticipate some of the special thrills that DXing in Open Range can offer. You'd think that someone like me who was raised on the prairies of Oklahoma and Texas would know better.

Since AC power was only available in the village of Hangaroa and fearing being stranded by a dead car battery at such a remote location, Bryant relied exclusively on battery-powered radios and peripheral equipment. Working light was provided by a multi-LED hikers headlamp.

Awesome DX

During that first introductory evening of DXing, I noted that there was already DX on the band when I turned on an hour before sunset, at 0030 UTC; I decided to begin all other sessions at 0000 UTC, fully 90 minutes before sundown. So, on that first Friday afternoon, I had the antennas out and my set-up primed to go at 0000UTC.

When I flipped the switch, I began the most surprising and thrilling DX session of my 53-year DX career. Fourteen non-stop hours later, I realized that I'd found the Mother of All DX Locations. In one night, I logged all continents, 22 countries and 122 stations... all but a few were IDed by station ID or by parallels.

I managed to log 15 IDed Kiwi and Aussie stations in 45 minutes. I wasn't trying for a speed record, but since I'm not going to report for QSLs, all I had to do was positively ID them. The conditions were absolutely fabulous: in that one night, I logged from Egypt clear around to India (YES!).

During that single night, I also logged 70 stations from Australia and New Zealand combined. The best receptions of that first full night were hearing my only Brazilian, Radio Tupi, 1280 kHz, in Rio, my first from Europe/Mid. East/N.Africa, Algeria's ENRS1-531 kHz, and hearing 1566, AIR Nagpur for 20 minutes, including a full EE ID and the 5 minute EE news that followed. I had no idea that the whole world would be

open to me *on medium wave*, from isolated Easter Island!

Spooky Visitors

What I have not admitted until now to anyone was that I got scared darn near out of my mind that night, too. I've never been totally comfortable DXing by myself at an isolated location, surrounded only by a small vehicle and in the pitch black dark. Unfortunately, I've also proven to myself that I hear DX much better with earphones, especially the fully-sealed variety that block out all ambient noise. On dark nights, alone, wearing those headphones, there is no chance to hear if anybody or *anything* approaches.

On that first moonless night, about 2:30a.m. in the pitch black dark, I could have sworn that I heard something just outside the vehicle! I ripped off the 'phones and there was nothing there. Paranoid as usual. Four or five minutes later, I swore that I heard a couple of heavy footsteps! Off came the 'phones: nothing!! Ten minutes later, I was CERTAIN that I heard heavy breathing; off came the 'phones… nothing!

This time, I reached over and flipped on the headlights. The mini-SUV was surrounded by eight or ten horses, each peering in through the open windows, their noses not 3 feet from the vehicle! Had one of those obviously curious horses stuck his muzzle in the open car window to give me a lick… or just whinnied loudly, I'm certain that I would have had the heart attack to end it all! Wow! Isn't DXing fun?

It Just Gets Better

The remaining three all-night DX sessions followed very much the same pattern as the first, though with a bit less assistance from the local free range barnyard. Carriers from Europe, North Africa, and the Middle East would appear about 90 minutes before local sunset, on the 9-kilohertz spacing. There would also be a few "early bird" South American carriers or low audio about the same time. At 60 minutes before sunset, audio from Europe, et al., would arrive.

Most of those signals would be only moderate level, but some of the Spanish and some of the Middle Eastern signals were startlingly strong. The really long-haul signals were pretty much gone by the time the sun touched the horizon at 0130, but by then South Americans crowded the dial.

By 0230, full dark, a few signals from eastern North America began to shoulder aside many of the South Americans. In the next two hours, the spotlight seemed to travel rather swiftly westward across the United States, with Cleveland and Charlotte being followed by Chicago and St. Louis and then by Denver, Salt Lake City, and Albuquerque.

By 0500, the spotlight swung to the US West Coast, with the large majority of the stations being heard from central and southern parts of California. Indeed, there was at least some California presence from about 0500 until 1330 UTC dawn on Easter Island. For

reasons that I don't begin to understand, the strongest (like a local!) station from California was 1530, kHz, KFBK, Sacramento, which far out-shone the more southerly California stations, high band or low.

By the middle of the local night at 0730 UTC, the New Zealand stations would begin to appear on the 9 kHz channels, with the Aussies joining the mix by 0900 hours. Although a few Japanese appeared as early as 0830, they were mostly logged during the local pre-dawn 1200-1300 time span.

One of the biggest surprises of the DXpedition was the absolute dominance of Chinese stations during the 30 minutes before and after the 1330 local sunrise on Easter Island. Chinese stations – LOTS of Chinese stations – traveled more than 9500 miles to populate the band during dawn enhancement! Things got so busy on the best Chinese dawn, March 24, that I was forced to choose between noting the presence of all of the Chinese signals on the band or taking the time to identify just a few and ignoring the rest. Since the presence of so many extraordinarily long distance signals seemed more important than the exact identity of a few, for the first time in my life, I just IDed the language positively, noted "UNID CC station" and moved on.

Each of the all-night sessions closed out with one extraordinary signal lasting long after the other signals faded out … and long after dawn. The first of these began with me innocently listening to 1566, HLAZ, the super-power Christian broadcaster from South Korea. HLAZ often lasts long after dawn at our Grayland, Washington, site, and it was doing quite well 40 minutes after dawn on March 17th.

Soon, I noticed something beneath HLAZ; as this second signal built, it certainly sounded like Hindi and I remembered that AIR Nagpur on 1566 had been heard by Patrick Martin on the Oregon Coast and was one of our "Holy Grail" targets at Grayland. As the signal rose to eventually dominate 1566, it did prove to be All India Radio, Nagpur, over 11,700 miles away!

The following evening, the magical pre-sunset hour was highlighted by the first of several receptions of Radio Farda-1575 broadcasting to Iran from the United Arab Emirates, a distance of 11,400 miles from my Easter Island cliff-side QTH. The reception was made even more memorable by the content of the

John Bryant holds his now-beloved Eton E1-XM along with the reel of 28 gauge Teflon-coated antenna wire that provided two 500-foot long Beverage antennas, laid directly on the ground. The background is the outer slope of the Rano Raraku volcanic cone, the quarry for the famous moai heads of Easter Island.

pop music program: a Michael Jackson tune followed by some Rap music in Farsi. That must drive the Iranian authorities crazy; it sure does it for me!

That second all-nighter was closed out with another extraordinary reception. Well after dawn (and time to try again for Nagpur on 1566) on my way up the dial, I noticed an unusual signal on 1413: it sounded (and was) Hindi, and I was fascinated. Checking in the East Asia-Pacific section of *WRTH*, I could find no major station on 1413 that ought to be transmitting Hindi at that hour. The Hindi talk-programming contained a few English words mixed in the conversation (not unusual in itself), and then there was one full interview in very British English about cricket. Wow!

I kept listening, hoping for a station identification… and then I heard a website given out: it was something like "hindi.bbc.uk." A light bulb lit: 1413 is the MW frequency for the huge BBC Oman Relay Station! Sure enough, their schedule shows an hour of Hindi, beamed eastward to India (and directly at far-off Easter Island) at the proper hour. Further listening on subsequent mornings proved beyond a doubt that I was hearing the Oman Relay Station, from well over 13,350 miles away.

If you combine the reception of Radio Farda-1575 kHz, heard before sunset (11,400 miles) with the BBC-Oman reception, long-path and post-sunrise (13,350 miles), I was able to more than circle the globe in a single DX session, *on medium wave*. I never imagined that would be possible and I felt extraordinarily privileged.

A Taste of Reality

The all-night DX sessions continued to be accompanied by visits from the local free range horses and cows, though no session was quite as frightening as that first one. The second Saturday night, I decided to get about three hours of sleep there in the car seat, before the Kiwi stations faded in. I did lock the doors, but the night was too warm to roll up the windows. Naturally the horse herd waited until I was sound asleep and then stampeded right past the vehicle. I could almost hear them giggling as they thundered past! Luckily neither the coax lead-in nor the very fragile antennas were caught up in the stampede.

I was very conscious that the most memorable DXpedition of my long career was coming to a close as I set up the equipment late the next (and last) afternoon. I will admit that I had a premonition as I was laying out the Beverages that last time: I saw the horse herd about a kilometer away in one of the high pastures on the side of the volcano. Well, things started out quite normally; the European and Middle Eastern signals seemed fewer and weaker than past evenings, but heck, anything from 9,000 miles away on medium wave is remarkable!

After about 45 minutes of very good DXing, but well before dark, the local horse herd invaded my antenna farm once again. Even though I grew up in North America's largest pasture, the South Prairie, I was not excited about getting out of the vehicle and mixing with the herd; however, it WAS the last night and I had to save those antennas, so I tried to shoo them away with my best cowboy imitation. I was having some success, but then it became obvious that the number one stallion was feeling very amorous... and I retreated to the DX truck in a hurry!

Still before dark, the stallion and his filly of the evening managed to consummate their love right at the far end of my east/west Beverage.... Thankfully, the honeymoon couple was over a little rise, so I could only see their heads and necks; and it *was* getting dark, so equine modesty was largely preserved.

Later inspection of the E-W wire by flashlight showed that I was really lucky... the wire was only slightly damaged. I did notice throughout the night that the North wire wasn't working too well. When I reeled the Beverages in after dawn, I discovered that the herd, while acting as a chorus for the amorous couple, had managed to cut the N-S wire at about the 200 foot mark. There are all sorts of problems when you deploy long BOG antennas in a free range area that is heavily populated by horses, cows and chickens!

Reliving the Memories

As I flew back to North America, I tried to sum up what will certainly be my most memorable DXpedition. The final all-session count was 235 different stations logged, in 40 countries, on all continents except nearby Antarctica. As we winged our way north over coastal Ecuador, I tried to make a list of my most memorable catches, arranging them by continents. Probably the most memorable European station was a still "tentative" reception of Ireland, RTE Radio 1, on 567 in Tulamore.

Certainly the most memorable Middle Eastern receptions were the "Around the World" pair of short-path Radio Farda-1575 in UAE before sunset, followed 14 hours later by long-path BBC Oman Relay on 1413 kHz, after sunrise.

My only Africans were rather large national stations in Egypt, Algeria and Morocco, but they were each memorable, too. In North America, it was surprising that I did not hear any Canadians; I'd guess that my most memorable US stations were two from New York City, WFAN-660 and WBBR-1130 along with the very much smaller stations, WTBN-570, Pinellas Park, FL, and WCNZ-1650, Cedar Falls, Iowa.

It was even more difficult to select the most memorable catches from South America. If pressed, I'd probably select my only Brazilian, Radio Tupi in Rio on 1280 kHz, which boomed in on two different nights; but then there is that unidentified station on 530 kHz that I heard one night simulcasting BBC World Service. About the only station that can be is Falkland Island Radio Service, and the programming seems to fit their published schedule.

Unfortunately, The Down Under radio scene is much like the MW band in the US: dominated by large networks and groups of stations and carrying just a few syndicated programs – not a very memorable radio scene. Two of the few determinedly independent stations Down Under were most memorable for me: Australia's 4CC-927 in Gladstone, Queensland, and New Zealand's tiny "More FM" operating on 531 kHz, from Alexandra in the far interior of the South Island.

Although I heard many "old friends" from Japan and more Chinese stations in four dawns than I have in 20 years of at least sporadic DXing from Washington state, by far my most memorable moment on the DXpedition was (after being sure that the 1566-Hindi station had faded out before station break) when I heard the announcer in Delhi suddenly say "*All India Radio. Here is the News read by...*"

I would especially like to express my appreciation to numerous senior members of the MW DX community who helped me in the planning of this DXpedition and in identifying many of the stations heard during those thrilling DX sessions. Without their help, so freely given, this experience would have been ever so much less enjoyable and productive. I should also add that, as wonderful as the DX was, the scenery, the monuments, the archaeological sites almost without number and the extraordinarily friendly inhabitants of Easter Island were even more memorable than the DX. My visit to Easter Island was truly the most fun that I've ever had with my clothes on!

To escape the electrical noise of Hangaroa and find a suitable location for a fan of 500-foot Beverage antennas, John Bryant rented a small ruggedized SUV and traveled to the furtherest reach of nearly impassable roads to the Te Peu DX site.

Easter Island Loggings by Country
March 16 - 25, 2007

STATION TOTALS

Europe, Middle East and North Africa:
21 stations in 13 countries: Spain (7), Egypt (2), Saudi Arabia (2), Algeria, Eire(p), Bosnia(p), Morocco, Netherlands, Portugal, Syria, France, Oman and UAE.

East and South Asia:
68 stations in 8 countries: China (40), Japan (18), Philippines (3), South Korea (3), North Korea, Taiwan(t), India and Thailand.

Pacific:
72 stations in 6 countries: New Zealand (36), Australia (32) Fiji, Hawaii, Tahiti and Tonga

Reception of Radio Farda-1575 kHz., Dhabbaya, U.A.E
11,390 miles at 96 degrees, pre-sunset, 0040 UTC

Reception of BBC Relay Station-1413 kHz., Al Ashkarah, Oman
13,210 miles at 295 degrees, post-sunrise, 1420 UTC

Around the World on Medium Wave in a Single Easter Island DX Session

North and Central America:
46 stations in 7 countries: USA (35), Mexico (5), St.Kitts & Nevis (2), Turks & Caicos, Cuba, Netherlands Antilles and the Virgin Islands

South America:
32 stations in 6 countries: Peru (15), Argentina (9), Ecuador (4), Brazil, Chile and the Falkland Islands

EUROPE, M.E. & N.AFRICA

531 ALGERIA ENRS1, Ain El-Beida , 0100
567 EIRE RTE1, Tulamore, (t) 0157
585 SPAIN RNE1 Madrid , 0105
612 BOS-HERZ. B-H R. 1, Sarajevo(t) , 0103
621 SPAIN RNE1 Synchros , 0205
684 SPAIN RNE1, Sevilla , 0101
711 SPAIN COPE, Murcia (pres.), 0103
711 MOROCCO RTM, Laayoune (pres.) , 2231
738 SPAIN RNE1 Barcelona , Mar 18 0104
747 SPAIN RNE5 Synchros, Mar 17 0114
747 NETHERLANDS R. 5, Flevoland, 0125
774 EGYPT ERTU M-E Prg., Abis (pres.), 0120
783 PORTUGAL R. Nacional, Avanca, 0038
783 SYRIA ORTAS 1, Tartus (pres.) , 0125
855 SPAIN RNE1 Synchros. 0109
864 EGYPT ERTU, Santah (pres.) 0124
945 FRANCE France Bleu, Toulouse, 0212
1413 OMAN BBC Relay, A'Seela, 1407
1512 SAUDI ARABIA BSKSA Jeddah, 0045
1521 SAUDI ARABIA BSKSA, Duba, 0055
1575 U.A.E. Radio Farda, Al-Dhabbiya, 0130

EAST AND SOUTH ASIA

CHINA
549 CHINA CNR5 Fujian (pres.), 1347
666 CHINA V. of Straits (pres.), 1120
 684 CHINA CNR6, Putian, FJ, 1352
765 CHINA CNR5, Fujian, 1306
783 CHINA V. of the Strait, Fujian (pres.), 1202
873 CHINA V. of Straits, Fuzhou (pres.), 1125
909 CHINA CNR6, Quangzhou, 1313
927 CHINA CNR6, Fujian, 1313
936 CHINA UNID CC probably Anhui, 1325
963 CHINA CRI Russian Service, 1135
981 CHINA CNR1, Synchros, 1350
990 CHINA CNR (N) Shanghai (pres.), 1328
999 CHINA UNID CC, Mar 24, 1335
1035 CHINA CNR1 Synchros, 1330.
1044 CHINA CNR FS. Korean, Yanji, 1327
1044 CHINA CNR JJ Service, Changzhou, 1334
1062 CHINA Zuijiang JGD, Guangzhou, 1334
1071 CHINA UNID CC, probably Tianjin, 1336
1089 CHINA CNR6 Fujian, 1318
1116 CHINA CNR5, Shaowu, 1314.
1125 CHINA Hebei E., Shijiazhuang,1337
1134 CHINA UNID CC probably CNR1, 1215
1170 CHINA UNID CCs, two mixing, 1342
1179 CHINA UNID CCs, two mixing, 1345
1206 CHINA CNR Korean Service, 1232
1278 CHINA UNID CC probably Heibei, 1240
1305 CHINA UNID CC, 1245
1323 CHINA UNID CC, 1247
1332 CHINA UNID CC prob.Fuzhou, 1250
1377 CHINA CNR1, Zengzhou, 1333.
1377 CHINA UNID prob. V of the Strait' 1320
1386 CHINA UNID prob. CNR1, 1350
1395 CHINA UNID prob. Anhui 'Life', 1358.
1404 CHINA UNID prob. Fujian EBS, 1335
1422 CHINA UNID prob. Shanghai JGD, 1304
1485 CHINA UNID CC, 1250
1593 CHINA CNR1. Changzhou, 1228
1593 CHINA CRI JJ Svc., Heilongjiang, 1345
1602 CHINA UNID CC, 1346

JAPAN
594 JAPAN JOAK, Tokyo, 1017
693 JAPAN JOAB, Tokyo, 1058
747 JAPAN JOIB, Sapporo, 0816
774 JAPAN JOUB, Akita, 0816
828 JAPAN JOBB, Osaka, 1207
873 JAPAN JOGB, Kumamoto, 1210
891 JAPAN JOHK, Sendai, 1212
954 JAPAN JOKR, Tokyo, 1218
1017 JAPAN JOLB, Fukuoka, 1220
1134 JAPAN JOQR, Tokyo, 1228
1242 JAPAN JOLF, Tokyo, 1235
1260 JAPAN JOIR, Sendai, 1347
1287 JAPAN JOHR, Sapporo, 1242
1314 JAPAN JOUF, Osaka, 1340
1413 JAPAN JOIF, Fukuoka, 1401
1422 JAPAN JORF, Yokohama, 0919
1440 JAPAN JOWF, Sapporo, 1357
1602 JAPAN NHK2 Synchros, 1257

OTHER EAST & SOUTH ASIANS
657 N. KOREA Pyongyang BS, Kangnam, 1403
972 S. KOREA HLCA, Dangjin, 1115
1170 S. KOREA HLSR RK JJ Svc., Gimji, 1231
1143 TAIWAN probably BEL3, Taiwan, 1341
1170 PHILIPPINES VOA Relay, Poro, 1335
1458 PHILIPPINES DWRF, FEBC, Iba, 1541
1494 PHILIPPINES DYAB, Cebu City, 1340
1566 S. KOREA HLAZ, Cheju Island, 1340
1566 INDIA AIR Nagpur, 1411
1575 THAILAND VOA Thailand, 1142

PACIFIC

AUSTRALIA
531 AUSTRALIA 4KZ, Innisfail, 1146
540 AUSTRALIA 4QL Longreach, 1140
549 AUSTRALIA 2CR, Orange, 1235
576 AUSTRALIA 2RN, Sydney, 0847
585 AUSTRALIA 7RN, Hobart, 1107
594 AUSTRALIA 3WV, Horsham, 1245
612 AUSTRALIA 4QR, Brisbane, 0804
630 AUSTRALIA 4QN, Townsville, 1112
648 AUSTRALIA 2NU, Tamworth, 1054
657 AUSTRALIA 2BY Byrock, 0810
684 AUSTRALIA 2KP, Kempsey, 1057
702 AUSTRALIA 2BL, Sydney, 0907
729 AUSTRALIA 5RN, Adelaide, 1254
738 AUSTRALIA 2NR Grafton, 1058
747 AUSTRALIA 4QS, Toowoomba, 1059
774 AUSTRALIA 3LO, Melbourne, 1050
792 AUSTRALIA 4RN Brisbane, 1053
828 AUSTRALIA 3GI, Sale, 1102
837 AUSTRALIA 4RK, Rockhampton, 0830
846 AUSTRALIA 2RN Canberra, 1104
864 AUSTRALIA 4GR, Toowoomba, 1057
873 AUSTRALIA 2GB, Sydney, 1306
891 AUSTRALIA 4TAB, Townsville, 1202
927 AUSTRALIA 4CC, Gladstone, 0830
1116 AUSTRALIA 4BC, Brisbane, 1120
1224 AUSTRALIA 2RPH, Sydney, 1440
1233 AUSTRALIA 2NC, Newcastle, 1212
1287 AUSTRALIA 2TM, Tamworth, 1125
1431 AUSTRALIA 2RN Wollongon, 1230
1512 AUSTRALIA 2RN Newcastle, 1405
1548 AUSTRALIA 4QD, Emerald, 0758
1566 AUSTRALIA 3NE Wangaratta, 1410

NEW ZEALAND
531 N.Z. More FM, Alexandra, 1340
567 N.Z. National Radio, Wellington, 0753
594 N.Z. R.Rhema Synchros, 0850
612 N.Z. R.Rhema, Christchurch, 1022
621 N.Z. R.Rhema Synchros, 1349

648 N.Z. R.Rhema, Gisborne, 0855
657 N.Z. Southern Star, Wellington, 1030
675 N.Z. National Radio, Christchurch, 1035
693 N.Z. Radio Sport, Dunedin, 1038
711 N.Z. Trackside/R.Pacific, Wellington, 1325
720 N.Z. National Radio, Invercargill, 1325
738 N.Z. Radio Live, Christchurch, 1330
783 N.Z. Samoan Cap. R., Wellington, 0720
792 N.Z. Radio Sport, Hamilton, 1053
810 N.Z. National Radio, Dunedin, 1340
819 N.Z. National Radio, Tauranga, 1340
837 N.Z. National Radio Synchros, 0822
864 N.Z. NewsTalk ZB, Invercargill, 1057
882 N.Z. Southern Star, Auckland, 1348
900 N.Z. 4YC, Southern Star, Dunedin, 1307
918 N.Z. National Radio Synchros, 0820
945 N.Z. NewsTalk ZB, Gisborne, 0721
972 N.Z. R. Rhema, Wellington (pres.), 1106
1026 N.Z. NewsTalk ZB Synchros, 1222
1035 N.Z. NewsTalk ZB, Wellington, 0735
1044 N.Z. NewsTalk ZB, Dunedin, 0738
1080 N.Z. NewsTalk ZB, Auckland, 1331
1125 N.Z. Radio Sport, Napier-Hastings, 0740
1152 N.Z. NewsTalk ZB, Timaru, 0742
1215 N.Z. NewsTalk ZB, Kaihoke, 1120
1278 N.Z. NewsTalk ZB, Napier-Hastings, 0740
1296 N.Z. NewsTalk ZB, Hamilton, 0750
1314 N.Z. National Radio, Gisborne, 0753
1386 N.Z. R.Tarana, Auckland (pres.), 1135
1485 N.Z. R.Trackside, Gisborne (pres.), 1136
1494 N.Z. Southern Star, Hamilton, 0755

OTHER PACIFIC STATIONS
558 FIJI Radio Fiji 1, Suva, 0757
720 HAWAII KUAI, Ele'ele, 1156

738 TAHITI RFO/R. Tahiti, Mahina, 0715
1017 TONGA A3Z, R. Tonga (t), 0731

NORTH AMERICA

USA
570 USA WTBN, Pinellas Park, FL, 0200
570 USA KLAC, Los Angeles, CA, 0240
640 USA KFI, Los Angeles, 1157
660 USA WFAN, New York, NY, 0248.
670 USA WSCR, Chicago, 0140
680 USA WPTF, Raliegh, NC, 1429.
700 USA KALL, N. Salt Lake City, UT, 1205
720 USA WGN, Chicago, 0445
740 USA KTRH, Houston, TX, 0230
740 USA KCBS, San Francisco, CA, 0925
770 USA KKOB, Albuquerque, NM, 1020
780 USA WBBM, Chicago, IL, 1054
810 USA KGO, San Francisco, CA, 0930.
830 USA WCCO, Minneapolis, MN, 0252
850 USA KOA, Denver, CO, 0256
880 USA KRVN, Lexington, NE, 0259.
1000 USA KOMO, Seattle, WA, 0911
1020 USA KCKN, Roswell, NM, 1205
1040 USA WHO, Des Moines, IA, 0320
1070 USA KNX, Los Angeles, CA, 0916.
1100 USA WTAM, Cleveland, OH, 0150
1110 USA WBT, Charlotte, NC, 0202.
1140 USA KHTK, Sacramento, CA, 0535
1120 USA KMOX, St. Louis, MO, 0327
1130 USA WBBR, New York, 0205
1160 USA KSL, Salt Lake City, UT, 0328
1180 USA Radio Marti, Marathon, FL, 0331
1200 USA WOAI, San Antinio, TX, 0458
1520 USA KVTA, Oxnard, CA, 0856
1530 USA KFBK, Sacramento, CA, 0700
1540 USA KMPC, Los Angeles, CA, 0705
1560 USA KNZR, Bakersfield, CA, 0900
1590 USA KKZZ, Santa Barbara, CA, 0905
1650 USA WCNZ, Cedar Falls, IA, 0210
1700 USA KVNS, Brownsville, TX, 0450

CENTRAL AMERICA
530 T&CAICOS R.V.C. Intl., S. Caicos, 0057
555 ST. KITTS ZIZ, St. Kitts (pres.) , 0130
570 CUBA R. Reloj, Santa Clara , 0200
690 MEXICO XE???, Tijuana , 0232
800 NETH. ANTIL. TWR, Bonaire, 0240
895 NEVIS V. of Nevis, Nevis (pres.) , 0130
1090 MEXICO XEPRS, Rosarito , 0430
1220 MEXICO XEB, Mexico City , 0626
1410 MEXICO XECF, Los Moches , 0850
1570 MEXICO XERF, Villa Acuna , 0445
1620 VIRGIN ISL. WDHP, St. Croix , 0205

SOUTH AMERICA

ARGENTINA
590 ARGENT. R. Continental, Cap.Fed., 0308
594 ARGENT. R. Continental, Cap.Fed., 0800
700 ARGENT. R. Cordoba, Cordoba, 0156
870 ARGENT. R. Nacional, Cap.Fed., 0610
1610 ARGENT. R. Guaviyu, (B.A.), 0400
1650.1 ARGENT. R. Renancer, Q.Oeste, 0125
1660 ARGENT. Hosana AM, Ezeiza, 0130
1663.1 ARGENT. R.Bethel, Banfield, 0153
1667.76 ARGENT. R. Bethel, Banfield, 0138

BRAZIL
1280 BRAZIL R. Tupi, Rio de Janeiro, 0023

CHILE
1380 CHILE R. Corporacion, Santiago, 0107
1569.9 CHILE, R.Familia, Talca, 0230 -

ECUADOR
540 ECUADOR R. Tropicana, Guayaquil, 0100
850 ECUADOR R.S.Francisco, Guayaquil, 0050
880 ECUADOR R. Catolica Nac., Quito, 0210
1120 ECUADOR Est.Inter'l, Guayaquil, 0028

FALKLAND ISLANDS
530 FALKLAND ISL. FIRS, Port Stanley, 0250

PERU
540 PERU R. Inca del Peru, Lima, 1417
580 PERU R. Maria, Lima, 1016
660 PERU R. Inolvidable, Lima, 0156
700 PERU R-700, La Grande, San Miguel, 0300
730 PERU R.Programas del Peru, Isidro, 0045 -
760 PERU Radio Mar Plus, Chorillos, 0230
820 PERU R. Libertad, Lima, 0241
880 PERU Radio Union, Lima, 0045
900 PERU R. Felicidad, Lima, 0325
960 PERU R. Pan Americana, Lima, 0102
990 PERU R.Latina/R.Victoria, Miraflores, 0300
1010 PERU R. Cielo, Lima, 0235
1400 PERU R. Callao Super, Lima (t), 0035
1470 PERU CPN Radio, Lima (pres.), 0040
1499.9 PERU R. Santa Rosa, Lima, 0122

Ahu Akivi and its seven giant moai statues is the only fully restored archeological site on the interior of the island. From a high inland valley, the ancestor-figure moai kept watch on the vllage of their descendants and from some distance away on the Te Peu DX site.

A Shortwave Roundup
Exploring the Programming on HF

By Eric Bryan

If you're like me, you're fascinated with certain countries or regions of the world and may have little interest in other areas. Obviously, these tastes are going to influence your shortwave listening. My areas of interest include Britain and Ireland, continental Europe and the Mediterranean, the Middle East, the Sahara/North Africa, Sub-Saharan Africa, and India.

You might tend to avoid transmissions from stations outside your areas of interest. But this would be a mistake. Though some shortwave broadcasters favor programming about domestic issues and that which generates tourism to their respective countries, many stations feature topics which range the globe. And even those who stick to domestic features still have international coverage in their news.

If you want African news, for example, the African services of Deutsche Welle, Voice of America, and the BBC (all often heard in the US) will give you considerable coverage and variety. And some broadcasters, such as Radio France International, have a truly global sweep to their coverage and topics.

While doing some concerted shortwave listening on my Degen DE1103, I followed along with a pencil and paper and made notes on the topics covered by various shortwave broadcasters in their English programming. (I did not count the stations' domestic coverage. Also, sometimes a broadcaster's international news is limited to that of other countries only in relation to the broadcaster's home country. But it can still be worth your time and often this is news you won't hear anywhere else).

Here is what I found, in the order in which I found it over a period of many months.

Shortwave Roundup

Radio Netherlands:
At 0100 UTC, 9845 kHz, *EuroQuest*: women in Islam in Turkey, protests in Ireland over proposed motorway which would cut through an ancient Celtic pagan site called Tara Hill, exorcisms in Romania, and nature therapy (gardening in a London allotment) for Iraqi torture victims. At 1900 on 17660, *Vox Humana*: western Australian monastery; *Wide Angle*: New Zealand race relations between Maoris and whites. At 1930 on 11655, news on Ethiopia, Zanzibar, Congo, Israel, Iran, France, Turkey, Libya, Egypt, Chad, and Pakistan; *NewsLine*: Parisian riots.

BBC:
At 0300 on 5975, *Outlook*: endangered turtles in Cambodia, and world music, focusing on traditional music of Armenia. At 0430 on 7120, *Network Africa*: hijacking of ships off the Somalian coast by modern pirates; *Assignment*: irrigation of the Egyptian desert via piping of the Nile. At 2030 on 12095, news on Syria, the US, India, Iraq, Cuba/Guantanamo Bay, and Germany; *Newshour*: UN Security Council investigation into possible Syrian connection to death of Lebanese PM, Rosa Parks remembrance, Parisian riots, avian flu, and Venezuelan president's railing against Halloween as "a gringo holiday."

Radio Prague Int'l, Czech Republic:
At 0330 on 6040, *Magazine*: Egyptology; *One on One*: interview with doctor who worked under Saddam Hussein. At 0400 on 6100, news on Iraq, Hungary, Luxembourg, the EU, and Mexico. At 0300 on 9870, news on the US, Israel, the UK, and Germany; *Current Affairs*: Wi-Fi connection access in Ukraine and Germany and elsewhere in Europe, the proposed independence of Montenegro from Serbia and joining the EU, the future EU membership of Croatia and Turkey, Holocaust denial and education, and possible EU membership of Iceland, Norway, and Switzerland in 2007; *One on One*: interview with post-traumatic stress disorder expert who treated people returning from Iraq and those who experienced terror attacks in Egypt, and who after the 9-11 attacks wrote a how-to book on dealing with the shock and stress of horrible experiences. At 0400 on 6200, news on Ireland, the US, Russia, and the EU; *One on One*: interview with Irish author.

Radio Taiwan Int'l:
At 0200 on 5950, news on the UK, the US, Vietnam, and China; *On People*: interview with English lawyer who provides legal aid to the poor in the UK, especially those wrongly convicted and tortured/forced to "confess" by police; *Instant Noodles*: dumping boyfriends or girlfriends in Australia via text messages, a musical premiering in Australia about Imelda Marcos, the naming of a panda in a Washington DC zoo, a prison break in India following the earthquake in Pakistan-Kashmir-India (with escapee slipping from Uri into Kashmir),

Tea or coffee go hand-in-hand with shortwave.

and Chinese astronauts sent into space with gourmet Chinese cuisine – 50 dishes, including cuttlefish.

Radio Japan:
At 0000 on 6145, *44 Minutes*: African wildlife, and new Iraqi constitution and elections; *Asia Watch* (a part of *44 Minutes*): news on Vietnam, China, Iran, Bangladesh, Thailand, Indonesia, India, Sri Lanka, and Malaysia. At 0500 on 6110, *44 Minutes*: feature on Lesotho.

Voice of Greece:
At 1830 on 12105, news on Indonesia, the US, Britain, Iraq, Cuba, Pakistan, and China; economic info on Japan, China, Germany, Poland, Hungary, Malta, Estonia, Latvia, and France; news on The Rolling Stones and Prince Charles; *Cultural Feature*: Russian painters of the 20th century; *Special Feature*: the modernization of the European Union, and flap between Germany and UK.

Voice of America:
At 1800 on 15580, *Africa News Now*: news on Hungary, the Vatican, Australia, and Nigeria. At 2000 on 15445, *Nightline Africa* ("All aboard the Night Train!"): news on Nigeria, Liberia, Sierra Leone, Uganda, and Sudan. At 2000 on 15445, feature on Somalia. At 2100 on 15580, news on Syria, the US, Israel, India, and Pakistan. At 2030 on 15580, *Africa World Tonight*: feature on American people's interest in Arab and Muslim culture, and interview with Egyptian Christian who teaches on Arab and Muslim culture.

Deutsche Welle:
At 2100 on 11865, news on Nigeria, Pakistan, Poland, England, and Iraq; *Religion & Society*: the Christian minority in Turkey; *Inspired Minds*: interview with US author Dawn Clifton Tripp. At 2100 on 11865, news on India, Iraq, the US, Iran, Israel, and Syria.

Radio Australia:
At 1600 on 5995, *Australia Talks Back*: "Dream Wranglers": call-in program for/about those who follow a dream – included interview with US filmmaker. At 2000 on 11880, news on India, Syria, Jordan, Indonesia, and Papua New Guinea. At 1730 on 11880, interview with Turkish film director discussing his movie about Kemal Ataturk, Gallipoli, and World War One.

CBC, Canada:
At 2000 on 15325, *Spotlight*: the history of Halloween, including interview with English professor who wrote book on Halloween. At 2300 on 9625, news on Indonesia, France, the European space program, and Jordan. At 0000 on 9755, news on Jordan, Iraq, Israel, the US, and France.

Radio Canada Int'l:
At 1800 on 15365, news on Iraq, Afghanistan, and Israel. At 1800 on 15235, news on Russia, Iraq, Algeria, Morocco, Egypt, Greece, Israel, France, Nigeria, Somalia, Sudan, China, Senegal, Mauritania, Canary Islands, and the US; *The Link*: Canadian policy in Afghanistan on prisoners of war, plight of Algerian man sent from Canada to US immediately after 9/11 who spent five years in detention as terror suspect, and interview with Maria Naimas, author of *Prisoner of Iran*, about her years of torture and beatings in Iranian prison (said she couldn't escape her past, so turned around and faced it full-on and wrote the book about it).

Radio France Int'l:
At 1700 on 17605, news on Sudan, Rwanda,

Eritrea, Senegal, Kenya, Liberia, and the US. At 1700 on 15605, news on Tanzania, Zanzibar, Nigeria, India, Eritrea, Zimbabwe, Burundi, Congo, Brazzaville, Morocco, and Iraq. At 1600 on 15605, news on Ethiopia, Eritrea, Zanzibar, Iran, Iraq, the US, Sudan, Germany, and Congo; *Voices*: interview with US author Darcey Steinke. At 1700 on 11615, news on Israel, Iran, South Africa, Turkey, Bulgaria, Greece, China, Congo, Russia, Ukraine, Italy, Zimbabwe, Kenya, Nigeria, Egypt, Iraq, Bangladesh, Sudan, Saudi Arabia, the Philippines, and extended segment on Afghanistan. At 1600 on 15160, news on Kenya, Saudi Arabia, Sweden, Pakistan, Germany, Iraq, Afghanistan, Zimbabwe, and Nigeria; *Network Europe*: stories on Germany, Sweden, Belarus, CIA detention centers in Europe, Kosovo, Serbia, and Belgium. At 0400 on 11700, news on Sudan, Congo, Somalia, Liberia, Nigeria, Canary Islands, Iraq, Afghanistan, Sri Lanka, East Timor, and Spain.

Channel Africa (South Africa):
At 1700 on 15235, news on Zambia, Nigeria, Uganda, and Gabon; *Africa This Week*: news on Ivory Coast, Botswana, Tanzania, malaria, and Homeless World Cup 2006 (football/soccer). At 0630 on 7385, news on Kenya, Jordan, Saudi Arabia, Egypt, and the US. At 0300 on 7390, news on Zimbabwe, Senegal, Sudan, Guinea, Zambia, Gambia, Congo, Tanzania, Algeria, Somalia, and the US; economic news on wireless internet in Zimbabwe; recent history of war and revolution in Liberia; UN Radio special on deteriorating conditions in post-war Sierra Leone (e.g., water and electricity shortages). At 0500 on 7240, news on Somalia, Morocco, the US, and Nigeria. At 0500 on 9685, news on Nigeria, Mali, the US, France, China, the UK, Russia, Israel, Lebanon, Lesotho, and nuclear conference in Vienna; *Economic News*: embargo on Liberia, fuel distribution in Uganda (fuel via Kenya), and Venezuelan energy and oil projects; *Africa Rise & Shine*: situation in Somalia with detailed eyewitness report from Mogadishu, return of refugees to Sudan (a UN Radio report), US-German meeting on free trade and climate change, US-Iran relations, employment in Swaziland, and computer and electronic equipment recycling in India (a UN Radio report from Bangalore), and weather report for throughout the African continent.

Radio Tanzania, Zanzibar:
At 1800 on 11735, news on China, Russia, South Korea, Cameroon, Kenya, Rwanda, Egypt, Nigeria, Pakistan, Sri Lanka, Uganda, South Africa, Afghanistan, the Philippines, the US, Sudan, Venezuela, Israel, Romania, Saudi Arabia, India, Thailand, Haiti, Iran, Zambia, Latvia, and Jordan.

Radio Jordan:
At 1600 on 11690, news on Iraq (in detail), Sudan, Lebanon, Israel, Syria, Iran, the US, Pakistan, India, Ethiopia, Saudi Arabia, China, and Eritrea. At 1700 on 11690, news on the US, Israel, the UK, the UN, Russia, Iran, Egypt, Iraq, Saudi Arabia, Afghanistan, Kuwait, Yemen, Turkey, India, Pakistan, Denmark, and Morocco; *Newspaper Headlines* (in Jordan): stories on Israel, Egypt, France, Saudi Arabia, Pakistan, the US, Singapore, Russia, Iran, India, Afghanistan, South Africa, Ukraine, and Uzbekistan.

KOL Israel:
At 1830 on 11590, news on the US, Syria, Iran, Nigeria, Germany, and in-depth segments on Syria and Iraq. At 0600 on 7385, news on Jordan, Saudi Arabia, Egypt, Iran, the US, and the UK. At 2000 on 11590, news on Pakistan,

Iran, the UN, Russia, Lebanon, Denmark, Syria, Saudi Arabia, Serbia, and Kosovo.

All India Radio:
At 1830 on 9425, news on Jordan, UN oil-for-food scandal, Pakistan, Sri Lanka, Nepal, Afghanistan, Kashmir, Asia-Pacific Summit, Bangladesh, Russia, China, Saudi Arabia, Israel, Iran, France, Germany, and the UK. At 2045 on 11620, news on Iraq, the US, and the UK. At 2200 on 11620, news on Afghanistan (with much detail on the Taliban), Argentina, Pakistan, the US, and Iran; commentary on Iran's nuclear program.

Radio Austria International:
At 1605 on 13675, *Week in Review*: UN declares Holocaust memorial day, 50 year old Austrian planning to walk Antarctica to the South Pole without technical support, CIA secret detention centers in Romania and Poland, and interview with writer of book about plight of women in the Bosnian war. At 1650 on 13675, *Report From Austria*: Iran's nuclear program. At 0040 on 7325, news on Iran, France, Germany, and the UK. At 1615 on 13675, news on Iran, Israel, the Balkans, Romania, and Kosovo; *Report From Austria*: debate of the Quartet (the EU, the US, the UN, and Russia) whether or not new Palestinian Hamas government should receive foreign funding, and search for new president of Kosovo.

Radio New Zealand:
At 1700 on 9870, news on Tonga, Papua New Guinea, Vanuatu, Fiji, French Polynesia, and Marshall Islands; *Pacific Correspondent*: feature on Guam, with info on medicine, museums, and coral reefs. At 1900 on 11725, *World News*: news on Fiji, Indonesia, the UK, Iraq, and Pakistan; *Asia-Pacific News*: coverage of the Solomon Islands and Papua New Guinea.

RAI Italy:
At 0055 on 11800, news on the EU, France, Iraq, Germany, the UK, Venezuela, Afghanistan, Russia, Croatia, Algeria, Egypt, Syria, Denmark, Spain, Austria, France, Portugal, Czech Republic, Hungary, Mexico, Poland, Ukraine, Israel, the Balkans, and the US.

Voice of Russia:
At 0300 on 15595, news on Iraq, France, Germany, Iran, Syria, Lebanon, India, Pakistan, Mongolia, China, Israel, the US, Ukraine, Moldova, Georgia, and Afghanistan; *News and Views*: the EU, Iraq, the US, Chechnya, China, and Israel. At 0500 on 9840, news on Israel, Iran, and Japan. At 0200 on 13635, *News and Views*: analysis and commentary on US presence in Iraq, debate on Kosovo and Belgrade regarding the UN 1999 Resolution, the exhumation of remains of Soviet soldiers at a war memorial in Estonia, and criticism of both Turkey's WWI policy of genocide against its Armenian population and Turkey's current policies on Georgia and Kosovo.

Vatican Radio:
At 1730 on 11625, news on Ghana, Iraq, Liberia, Zambia, Belgium, Uganda, Nigeria, Israel, Iran, Sudan, South Africa, Lebanon, Cuba, Egypt, Somalia, Rwanda, Tanzania, Jordan, Congo, and Morocco. At 0500 on 7360, *African Panorama*: elections in Uganda; Belgian airline flights from Brussels to Rwanda.

KBS World Radio, South Korea:
At 0200 on 11810, news on Japan, China, Taiwan, Asia-Pacific Summit, North Korea, United Arab Emirates, the US, Iraq, and Iran; commentary on US presence in South Korea.

China Radio International:

At 2300 on 11970, *News and Reports*: news on Indonesia, the US, Jordan, Iraq, Spain, North Korea, Israel, France, Germany, Afghanistan, and the EU.

Radio Thailand:

At 0300 on 5890, news on Japan, the US, Jordan, the UK, Indonesia, and Switzerland; *Passage to Russia*: the 1892 visit by Grand Duke Nicholas II to Siam, celebrating the construction of the Trans-Siberian Railway (presented by Thai Airways, "Smooth as Silk").

Radio Exterior de España, Spain:

At 0000 on 6055, news on Iraq (in-depth), Asia-Pacific Summit, Israel, France, Italy, Chile, Mexico, the US (in-depth), Venezuela, North Korea, Iran, the EU, Albania, Lebanon, the UK, the Vatican, Bolivia, Russia, Ukraine, Germany, Hungary, Norway, Afghanistan, South Korea, Portugal, and Ecuador; *American Chronicles*: program on Latin America, with coverage of Chile, Peru, Venezuela, Colombia, the West Indies, and Haiti; *Lab Notes & Field* Notes: health benefits of the Mediterranean diet, focusing on olive oil, skim milk, and other low-fat dairy products; *Press Review* (what's in Spanish newspapers): topics covered Serbia-Montenegro and Bolivia. At 2000 on 15290, news on Italy, Iraq, Israel, France, Mexico, Sierra Leone, Bolivia, and Chile. At 0000 on 15385, news on Israel, Iraq, Egypt, Algeria, Morocco, Senegal, Equatorial Guinea, Liberia, and Poland; *Lab Notes & Field Notes*: health benefits of moderate consumption of red wine and coffee. At 0000 on 6055, *Radio Waves*: feature about Radio Racja, which broadcasts from Poland into Belarus.

Star Radio, Liberia:

At 2100 on 11960, news on Ukraine, China, Sudan, Chad, Israel, Egypt, Nigeria, Ghana, South Africa, Uganda, Congo, the US, and Iraq.

Voice of Vietnam:

At 0100 on 6175, news on Israel, Egypt, Cambodia, China, Chechnya, Russia, Japan, Germany, Iran, Singapore, Philippines, Italy, Iraq, Turkey, and North Korea; commentary on CIA detention centers and alleged torture; special coverage of Israel and Ariel Sharon.

Radio Cairo, Egypt:

At 0200 on 7270, *The Meaning of the Koran*: Koran singing translated into English; news on Sudan, Israel, Iraq (with extended segments), the US, Germany, Italy, France, Denmark, Lebanon, Syria, Iran, Russia, Congo, India, Tunisia, Pakistan, Afghanistan, the EU, Austria, the UK, Algeria, Sierra Leone, Liberia, Mauritania, Saudi Arabia, Somalia, Uganda, and North Korea.

Radio Sweden:

At 0230 on 6010, *News & Reports*: news on Israel, Serbia-Montenegro, Germany, the UK, Denmark, Norway, Spain, Russia, Ukraine, Italy, Morocco, the US, France, and Austria; reports on France commemorating end of slavery (via RFI), health care in Romania (via Radio Netherlands), the Polish Welfare Association in Northern Ireland (via Radio Polonia), and Iran's nuclear program. At 0330 on 6010, *News & Reports*: news on Denmark, Tunisia, Indonesia, Sudan, and Germany; features on malaria, furor over Islam-related cartoons in Scandinavian newspapers, and prisons in Iraq.

Radio Bulgaria:

At 0000 on 9700, news on Romania, Iraq, Af-

ghanistan, Bosnia-Herzegovina, Libya, Turkey, the Balkans, Croatia, Czech Republic, Estonia, Nigeria, Poland, the US, Austria, Albania, the EU, Israel, Kosovo, Germany, Iran, Kazakhstan, and Russia; *Events & Developments*: stories on Albania, Slovenia, Greece, Turkey, Italy, and Serbia.

Radio Vilnius, Lithuania:

At 2330 on 7325, news on Russia, the US, Estonia, Slovenia, the EU, and Austria. At 0030 on 11690, news on South Korea-Lithuania bilateral relations; recall of Lithuanian ambassadors from Denmark, Iceland, Croatia, Slovenia, Sweden, Estonia, Latvia, etc.; news on Belarus, the EU, Cyprus, Malta, Serbia, Romania, Bulgaria, the UK, Poland, Moldova, Ukraine, Slovakia, Iraq, Germany, Russia, and the US (coverage of the Cheney-Putin flap over Cheney's statement in Lithuania); program on Lithuanian community in Sweden.

Radio Slovakia International:

At 0100 on 7230, *Slovakia Today*: news on Kosovo, Russia, Hungary, the EU, Denmark, Italy, Israel, Spain, Germany, Austria, France, Sweden, Poland, Czech Republic, Serbia-Montenegro, the UK, the US, Croatia, and Albania; *Insight Central Europe*: features on politics/elections in Poland, Czech Republic, Slovenia, Hungary, and Belarus, including reports from Radio Polonia, Radio Prague Int'l, Radio Slovenia, and Radio Budapest.

Croatian Radio, Croatia:

At 0300 on 7285, *Croatia Today*: news on

Serbia-Montenegro, the EU, Austria, former Yugoslavia, Russia, Ukraine, Vatican, Switzerland, Greece, Germany, the US, the UK, Bosnia-Herzegovina, Macedonia, Albania, Slovakia, Belgium, Italy, Hungary, Ireland, Poland, the Balkans, Slovenia, India, Kosovo, Nigeria, Pakistan, Iran, Lithuania, and Denmark.

Banns Radio International, Denmark:

At 0630 on 7385, (Sundays) *Copenhagen Calling*: news on Saudi Arabia, Libya, Iran, Sweden, Norway, Finland, the EU, the US, and Bulgaria; piece on discovery of a planet by Danish astronomers working from Chilean observatory.

Voice of Nigeria:

At 1700 on 15120, *Sixty Minutes*: news on Kenya, Egypt, Sudan, Indonesia, Japan, Iraq, Zimbabwe, the US, Uganda, Somalia, Burundi, Congo, Israel, and India. At 2000 on 15120, *Sixty Minutes*: news on Congo, Ethiopia, Pakistan, Afghanistan, the US, Iraq, Somalia, Kenya, and Uganda; feature on tuberculosis in Africa.

Adventist World Radio, via KSDA Guam:

At 1600 on 12065, *Wavescan*: history, culture, and religions of Myanmar/Burma; DX report.

Radio Romania Int'l:

At 0400 on 6115, *Radio Newsreel*: news on Israel, Indonesia, Kosovo, Iraq, Lebanon, Iran, Portugal, and Bulgaria. At 0400 on 11820, *Radio Newsreel*: news on the EU, China, Japan, Israel, and Italy. At 0400 on 9780, *Radio News-*

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reel: news on Iran, Italy, Bulgaria, Poland, Finland, Gt. Britain, Ireland, Israel, Afghanistan, Slovakia, Iraq, and the EU; program about the Black Sea states with coverage of Azerbaijan and Russia.

Radio Budapest, Hungary:
At 0200 on 9515, news on Italy, Slovakia, Turkey, Venezuela, Israel, and Slovenia; *Hungary Today*: interview with British travelwriter; medical report on stimulating antibody production to fight high cholesterol. At 0100 on 9590, news on Pakistan, Israel, Croatia, Austria, Sweden, Portugal, Finland, Czech Republic, Germany, France, Slovakia, and Slovenia; *Spotlight*: relations between Britain and Hungary; *The Week*: coverage of Turkey and Sweden, and segment on Irish culture; *DX Corner*: 75th anniversary and history of HCJB, Quito, Ecuador; *Insight Central Europe*: healthcare in Slovakia, the East European Television Awards held in Slovenia, Labor Day in the Czech Republic, and the closing of a landmark nightclub in Poland. At 0200 on 5980, news on Russia, Czech Republic, Poland, the US, Slovenia, Slovakia, Ukraine, Romania, Bulgaria, Germany, Kosovo, Serbia, Croatia, Turkey, and Afghanistan; *Insight Central Europe*: the opening of former Czechoslovakian police state records, Slovenia's considerable military etc. contribution to occupation of Iraq, and coverage of Poland.

Radio Ukraine Int'l:
At 0300 on 7440, news on Russia, Israel, the EU, Austria, Poland, Romania, Sri Lanka, Iran, and Syria; *The Whole World on the Radio Dial*: pros and cons of transmitting in Digital Radio Mondiale vs. AM modes, and former RCI's Ian McFarland's SW interval signal CDs. At 0100 on 7440, *News & Reports*: news on the EU, Italy, Belarus, the US, Czech Republic, Russia, Croatia, Poland, Malaysia, Slovenia, France, Canada, Belgium, and Morocco; *Music From Ukraine*: included references to music from South Korea, Finland, Portugal, and Russia; *Ukraine Today*: with coverage of the EU and Germany; *Ukrainian Diary*: with references to Germany, the EU, Portugal, Turkey, Argentina, Canada, the US, Uzbekistan, Russia, Bulgaria, and Romania, and Russian, North Korean, and Iranian flap over proposed US missile defense system sites in Poland and the Czech Republic.

Radio Havana Cuba:
At 0600 on 6000, *International News*: news on Guatemala, Pakistan, the US, Chile, Afghanistan, Haiti, and Iraq. At 0500 on 6000, *Economic Report*: Venezuela's economy and trade.

RAE, Argentina:
At 0200 on 11710, news on Holland, Chile, the EU, Paraguay, Uruguay, Cuba, Brazil, Italy, Belarus, Russia, the US, Iraq, and Bolivia.

Radio Tirana, Albania:
At 0330 on 7465, news on the US, the UK, Pakistan, Israel, Germany, Italy, Lithuania, Poland, Bulgaria, Greece, Ukraine, Slovenia, Macedonia, Georgia, Romania, Serbia, Kosovo, Russia, and Serbia-Montenegro; program on Albania's entry into the EU included material on Macedonia, Croatia, and Ukraine.

Voice of Turkey:
At 0300 on 6140, news on the EU, Cyprus, Iraq, and the US; *Review of the Turkish Press*: coverage of the EU. At 0400 on 6020, news on Iran, Saudi Arabia, Afghanistan, France, the US, Israel, Iraq, Pakistan, Persian Gulf, Gulf of Oman, Cyprus, the EU, Italy, the UK, Germany, Austria, Sweden, Denmark, Belgium, Arme-

nia, Jordan, Egypt, Armenia, Russia, South Africa, Indonesia, Congo, and India; *From the World*: smoking bans in Luxembourg, Russia, Sweden, and Belgium; *Review of the Turkish Press*: included coverage of Egypt, Pakistan, and Georgia, and detailed coverage of Iraq; *Eurasia*: Russian flap over proposed construction of US "Star Wars" missile defence sites in the Czech Republic and Poland; *Agenda*: commentary with references to Bulgaria, Pakistan, and Russia.

Voice of Justice, Iran:
At 0130 on 9495, news on Iraq, the US, Afghanistan, Israel, Turkey, Japan, Guam, India, Russia, Peru, Venezuela, Bolivia, Colombia, Ecuador, and North Korea; commentaries on situations in Iraq and Afghanistan, including interview with US official; coverage of Egypt, Syria, Sudan, and Saudi Arabia; *Occupation Crisis*: Kurdish New Year (March 21); Iraqi expectations of new government; energy crisis and Shell Oil flap in Nigeria.

RTE Ireland:
At 1300 on World Radio Network via KXOT 91.7 FM, news on Israel, Iraq, the US, Spain, and Australia; commentary on the Israeli-Palestinian situation and the occupation of Iraq.

Retreat to the Web

The following stations, due to frequencies used and/or broadcast schedules or propagation conditions, I finally despaired of hearing, and so I resorted to their websites. (Most of them I used to hear easily and regularly on shortwave.) The websites are listed below. Simply follow the English links (sometimes you have to hunt for them) where appropriate on the home pages. Some broadcasters provide material in text only; others have live streaming and/or audio on-demand or MP3 downloads available. Still others have some combination of text and streaming or audio on-demand or downloading.

Radio Polonia, Poland:
Audio on-demand at www.radio.com.pl/polonia/ *News From Poland*: included references to France, Holland, the EU, Northern Ireland, Russia, Germany, Ukraine, the UK, and Belarus; *Eurofile*: coverage included Latvia, Slovakia, Lithuania, and Estonia; *Europe East*: coverage of the Baltics, Ukraine, Belarus, former Yugoslav republics, Czech Republic, Hungary, Slovakia, Bulgaria, Romania, and Moldova.

Radio Belarus:
Audio on-demand at www.tvr.by/eng/radiobel.asp News with references to Armenia, Georgia, Kazakhstan, Moldova, Russia, Ukraine, Turkmenistan, the US, France, Bulgaria, Hungary, Sweden, and China.

The International Radio Serbia & Montenegro:
Programs in text at www.radioyu.org/index. php3?language=English *News*: China, the US, Russia, the EU, Czech Republic, and Austria; *Politics*: the Russian foreign policy in the Balkans; *Economy*: the freezing by Condoleezza Rice of US aid to Serbia.

Radio Damascus, Syria:
You can get access to material from both the domestic and international services through the website at www.rtv.gov.sy/ There are English links, but at the time of writing, the English portions of the website are under construction.

The Voice of Africa, Libya:
Material in text at www.ljbc.net *News*: coverage with references to Tunisia, Burkina Faso, Algeria, Qatar, Portugal, the US, Egypt, Oman, Yemen, the UK, Niger, Italy, the UAE, Sudan, Nigeria, Mali, Sierra Leone, Jordan, Syria, Iraq, the Arabian Peninsula, Senegal, Ivory Coast, the Sahara (referring to the tribes that dwell throughout the desert), Canada, Chad, Russia, Lebanon, Belgium, Cameroon, Central African Republic, Congo, Equatorial Guinea, Gabon, and Ghana.

Radio Singapore Int'l:
Material in text at www.rsi.sg *Newsline*: coverage of East Timor, Japan, Taiwan, China, Malaysia, Bangladesh, Indonesia (Java, Sumatra, etc.), the US, North Korea, Thailand, Russia, and Iraq. Also live streaming.

Keep Listening: It's Out There

You can see what you've been missing by not tuning around. Here's a recap of some of the plum highlights from the list:

If your passions are Egyptology or Irish writers, you might not have thought to tune into Radio Prague, but if you didn't, you lost out. Or African wildlife and Lesotho? That was Radio Japan. For early 20th Century Russian painters, it was The Voice of Greece.

American authors were interviewed on Deutsche Welle and RFI, and US and Turkish filmmakers were featured on Radio Australia.

If you have no interest in shortwave broadcasts from Canada, you missed the history of Halloween on CBC and the Iranian author on RCI. And I found much more about Iran on Radio Austria Int'l.

You could have learned about Guam via RNZI. And if wireless internet in Zimbabwe and computer recycling in India strike your fancy, you should have been listening to Channel Africa (South Africa). More African coverage was had from Vatican Radio's African services.

Are you interested in Latin America and healthful diet tips? I hope you were listening to REE Spain. The Voice of Vietnam carried analyses on the Israeli-Palestinian and Ariel Sharon situations. More analysis of Israel, plus detailed reports on Iraq, I got from RTE Ireland.

If you want to learn about malaria and Iraq prisons, Radio Sweden might not be the first broadcaster that leaps to mind. If not, check the list to see what's passed you by. And who would ever have expected AWR to have a feature on the history and culture of Myanmar/Burma?

Radio Budapest? They interviewed a British author, and had segments on Irish culture and the history of HCJB. More programming about shortwave I heard on Radio Ukraine Int'l with their debate about DRM vs. AM modes of broadcast.

And though there's not much news on Luxembourg these days, The Voice of Turkey looked into smoking bans in Luxembourg, Russia, Sweden, and Belgium.

Compiling this list was a lesson to me to be more open-minded and stop skipping over stations due to a lack of interest in their geography or culture.

Please consult the "Shortwave Guide" in this issue and other schedules for current broadcast times and frequencies.

The Kids Are Alright
The ARRL's "Big Project"

By Ken Reitz KS4ZR

QSL from K5LBJ, the club station for LBJ High School, Austin, TX founded in 2004. At LBJ High Amateur Radio is an elective class where teacher Ronny Risinger is the sponsor. Last year they copped top honors in the High School division in the School Club Roundup. (Courtesy: LBJ High School)

As America's ham radio population ages, the number of hams dwindles. Over the last 15 years, new schemes to expand this population by making it easier to obtain a license have not stemmed the out-rushing tide. And, if the future of amateur radio lies in the next generation, some hams are in despair. The common belief is that today's kids, pre-occupied with iPods, cell phones, and access to the Internet are not attracted to amateur radio. It's a lucky thing for the future of this hobby that many are not buying that belief.

The League Steps In

This past February marked the 22nd School Club Roundup (SCR), an on-air contest for schools (elementary, middle, high school, college and post-graduate) to activate their school club stations, promote awareness of amateur radio in schools, and introduce the students to world-wide HF amateur radio activities. The SCR is so popular that a second fall contest was added last October. This year's SCR was expected to be the best yet.

The school clubs involved have spent months and, for some, years of hard work on the part of dedicated class room teachers, parents, and administrators who are introducing America's students to amateur radio. The good news is that they don't have to do it alone. The American Radio Relay League (ARRL), the nation's foremost organization of radio amateurs, helps America's educators through its Amateur Radio Education & Technology Program (ETP) which is also known as "The Big Project."

The Big Project is a substantial program which not only provides interested teachers with information and support, but offers hands-on training and funding grants for qualifying schools. The ARRL says the goal of the Big Project, which is open to public and private schools, is "....to improve the quality of education by providing an educationally sound curriculum focused on wireless communications. The project emphasizes integration of technology, math, science, geography, writing, speaking, and social responsibility within a global society."

Part of the Big Project is to offer a "Teachers Institute on Wireless Technology," a sort of "summer camp" for teachers who want to become a Big Project school. The seminars are offered during the summer in Rocklin, CA; Spokane, WA; and at League HQ in Newington, CT. After four days of seminars, the teachers return to their hometowns with the know-how to incorporate amateur radio, robotics, space technology, satellites, and weather into their curriculum. They also come away with a *Radio Lab Handbook* and curriculum guide, instructional electronics kits, a magnetism kit, a Parallax Basic Robotics kit, a Parallax "What is a Micro Controller" kit, a Parrallax Optascope, resource supplies, and reference library. Some,

who have applied for station grants, even come away with a complete amateur radio station.

The best part about this program is that it's free. And, because it's free, enrollment in each session is limited to 12 participants. All applicants are screened thoroughly and given final approval by the ARRL Board of Directors. The League is looking for teachers or other participants who will make a long term commitment to being a Big Project school.

Mary Hobart, K1MMH, Chief Development Officer for the ARRL, says that funding for the Big Project is done through separate contributions to the League by a few donors. She says that the annual Big Project budget is around $150-200,000. According to Mark Spencer, WA8SME, director of the Teachers Institute on Wireless Technology, The Big Project has been operating for four years and currently has 222 Big Project schools up and running nationwide, introducing thousands of students to wireless technology each year. Spencer says that the mix of schools is about 50-50 public/private. Smaller public schools with a centrally located administration can help private schools move this type of project more quickly and cut through red tape encountered in the private sector.

While many have taken the League up on its Big Project offer of training and equipment, other teachers have started programs on their own. Many are already hams and enlist the cooperation of local ham radio clubs in their effort. Some also enlist the help of local ham radio related manufacturers. Whatever it takes.

These Schools Are Radio Active

So, how's it working out? Teachers, students and even administrators are enthusiastic about this program. There is a real sense of accomplishment with all involved. Here's a sample of the comments from club stations I contacted after the Feb. 2007 SCR:

Beaver Lake Middle School
KC7LHG (Issaquah, WA)

Robert Gregory, KD7H, a life long ham, was an advisor to his previous school club for over 15 years and now into his second year at Beaver Lake Middle School. He decided it was once again time to get radio-active. In his first school at least 15 students got their tickets and many are still active. At Beaver Lake he has already had two students receive Technician licenses (and studying for the General Class). He reports that another five are currently studying for their Tech license.

He writes, "Amateur radio has been a way of life for me for 45 years and, as a teacher, it's natural for me to enthusiastically share my beloved hobby with my students. In the beginning, I used my own equipment....there's never enough money in school budgets for...things like amateur radio transceivers,

School Club Station AD8B, Zion Lutheran School in Harvester, MO in Dave Von Dielingen's 6th grade class. (Courtesy: Dave Von Dielingen)

Ronny Risinger KC5EES, school club sponsor at K5LBJ accepts a grant in 2005 from Best Buy General Manager Steve Smith. Club President Noah Kalish, club VP Tamara Sevier, and club Elmer Joe Fisher look on. The club was able to buy computer equipment for their shack. (Courtesy: Ronny Risinger)

coax and antennas and one must volunteer after school time and gear, otherwise a (school) club would never happen." He reports that his Principal, Josh Almy, "...is very supportive of my radio club effort with the kids, [even] supporting the inclusion of School Club Roundup activities into the week's lessons. Also, club members' parents have been enthusiastic supporters."

Kermit King Elementary School
N6KKS (Arcadia, CA)

Mary Mason, W6ROX, a teacher at Kermit King Elementary School said, "We had a club at

the High School and I am a ham so I contacted the High School teacher and we arranged to have 2 meter simplex contacts with the High School the first year. We then planned to participate in the SCR in 2005. Tim Schiller, N6BT (of Force 12 Antennas), provided the antenna, a 20 meter dipole on a mast that we set up on the lawn. We won the elementary SCR division that year. We have continued to participate in SCR since that time. We do not have a station set up at the school year 'round but set up for the contests....

"There are issues of space, mounting the antennas on buildings and all the academic testing pressures to deal with. (Ham radio is not on the state assessments!)" She adds that she has received growing support from staff, parents and administrators.

Zion Lutheran School
AD8B (Harvester, MO)

Dave Von Dielingen, AD8B, a ham since 1964, started his club in 1993 for 6th through 8th graders at his school where he teaches 6th grade. He says, "Once a week meetings begin after Christmas break and lead up to the February School Club Roundup. During SCR club members become third-party operators at lunch time and after school. The two 6th grade Science classes also are involved during SCR. This year's SCR week was very short due to two snow days and another day off for a teacher workshop."

Because the sessions are so limited, they have not had any licensed hams emerge from their program. He says that the focus is on communications skills, shortwave propagation, maps and an introduction to the Amateur Radio service. He reports that he uses his own personal equipment for the SCR and has volunteers to help put up a horizontal loop for the contest.

Dave has developed an excellent logging program which can be used in the contest. The program may be found at his own web site: **http://home.earthlink.net/~scr-log**

Deep Woods Elementary School
KC5BZA (Round Rock, TX)

Tina Risinger, KC5BZA, got her school club station started because her husband Ronny, KC5EES, started a club station at LBJ High School where he teaches in Austin, TX. Their children attend Deep Woods Elementary. She says, "I got the "Big Project" training, and here we are! Deep Woods Elementary School is the only elementary in Central Texas with a radio station."

She adds, "Our principal had to cut a lot of red tape, so it took almost two years to get it going. But, the antenna was installed last fall, and we began calling this January." Of course, it's very early in their program but she reports that "...they are all asking about how to get a license! We are showing them how to take the practice tests on line and putting the practice books in the library."

She also says that they got their rig and antenna through the ARRL's "Big Project" and that cable was donated by a local ham. The school paid for the installation. Tina says, "The Principal (Janie Veach) has been fantastic, supporting us at every point. The faculty are interested and are amazed by and pleased to see the student interest.

The students are off the chart excited. They all want to talk and talk lots! The Superintendent's office called to congratulate us on entering the SCR for the first time."

St. Aloysius Radio Club
W4KBR (Shepardsville, KY)

John "Buddy" Sohl, Jr., KC4WQ, is the W4KBR school liaison with the Bullitt (county) Amateur Radio Society in Shepardsville, KY. He explains how the ARRL, local club and active individuals can combine to make a successful school radio club. He says, "The League provided us the Yaesu FT847 to cover 160 through 440 MHz as well as an all-band vertical and 3 element interlaced Yagi for 2 meter/440 MHz. Also included was the big MFJ tuner and some other odds and ends."

Buddy reports that the tower, two FM mobiles and a 2 meter HT were donated by other local hams. "There has been no cost to the school and very little out of pocket expense for me," says Buddy, "There have been a couple of pieces of equipment donated that have been sold off for operating expenditures and other equipment. One item of distinction was an OLD Hammerlund receiver that had been sitting for over 20 years. It was sold on eBay and brought well over $100 into the program."

"The Bullitt Amateur Radio Society," Buddy explains, "is the primary sponsor of the school station with assistance from the North Bullitt Contest Group. The program has produced five new licensees. Two have upgraded to general and three have graduated onto local high schools. The most satisfying and gratifying part of the program is to see the kids participate in a "conversation" with someone in another state or another part of the world."

One of the big supporters of the League's Big Project is legendary rock guitarist Joe Walsh, WB6ACU. Last year when W4KBR club members were invited to a local radio station to talk about amateur radio, Buddy sent Joe an e-mail to let him know the kids would be on the radio. Buddy explains, "...[Joe] called in to the radio interview and instead of spending the cursory 5 minutes with us he spent the entire hour chatting with the kids about radio and how it has grounded him during his life."

"I love amateur radio," says Buddy, and he says he wants it to "...continue for another 100 years, but to do that we each need to train our replacements. That is exactly what this type of program can do."

How Long is Your Shadow?

It ought to be heartening to even the crustiest of old hams to see the energy given by men and women to boys and girls throughout the country in promotion of a hobby which is not only fun but has a critical national security component. It should make you ask yourself: What kind of a shadow do I cast in amateur radio? All of the people mentioned above are ordinary people who are achieving extraordinary results and serve to illustrate that, if you're passionate about radio, there's something you can do to help promote this vital hobby in the school system where you live.

Here's what you can do: Find out if there are any such programs in any of the schools in your area. If you belong to a local amateur radio club suggest that the club look into sponsoring a school club for elementary, middle or high school. There's bound to be someone in your local club who is a teacher, principal or school board member. Introduce them all to the League's Big Project. But, before you do, get all the facts and study them yourself, so that you can answer basic questions and get the discussion off to a flying start.

You have to remember that starting a school club is a long term project; that nothing about it will be easy; that obstacles will pop up all over to frustrate your efforts, but you must also keep your eyes on the prize. One day a group of eager kids will line up to take their turns at the rig in a future School Club Roundup made possible with your help. Remember, too, that introducing young people to amateur radio doesn't mean they'll all get licenses or that they'll pay any attention to the subject after they're out of school. We all took Biology in school but few of us went on to become career biologists.

If you can't volunteer your time, how about donating a rig? I can't tell you how many times during an on-air QSO hams have spent ten minutes giving me an inventory of all the rigs sitting on shelves in their shacks. Why not stop hoarding rigs and start donating them to local clubs? Imagine how great you'll feel knowing that the local school club is on the air thanks to you!

Last Word

During the course of last February's SCR contest, I had a chance to work many stations from elementary schools to the Naval Post Graduate School. All of the students were having a great time and, while most operated Single Side Band (SSB), there were some operating CW and digital modes. Know that it's enough just to introduce kids of all ages to the concept of radio communications but don't stop at SSB. Work to broaden the scope of radio studies to include digital modes, Morse Code, AMSATs, construction (kits or home-brewed), antenna theory, and construction. Bring in local experts to help the teacher and show the students how it relates to future careers. This can be particularly important in middle and high school clubs. The potential is endless.

Tina Risinger summed up the excitement of amateur radio in the schools with a few choice quotes from students at Deep Woods Elementary School: "Emily R. says, 'I like to talk to other states.' Jarrod L. said, 'Entering a contest is cool. I like to log the contacts in.' Jonathan W. said, 'Get me a map! I want to look up Prince Edward Island. Where's a map?'"

REFERENCES

Here's a link to the ARRL's SCR 2007 Roundup:
www2.arrl.org/contests/rules/2007/scr/scr.pdf

Here's the latest list of Big Project schools. Find out if there's one near you:
www.arrl.org/FandES/tbp/big-proj-schools.html

If your area is not represented here's your chance! The Big Project application:
www.arrl.org/FandES/tbp/school-ap.html

Attn: New General Class Upgrades!
Welcome to the World of HF

Since February 23, the date at which the Morse code requirement was dropped from amateur radio license testing, an unprecedented number of newly upgraded hams have joined the fray on the High Frequency (HF) bands. The American Radio Relay League (ARRL) reports that from February 23 to April 30 (the most recent reporting date as this is written) 9,500 new Technician Class licensees were added and 10,000 former Techs had upgraded to General Class. That compares with 20,000 new Technician licensees and 3,900 General Class upgrades for *all* of 2006.

The effect of dropping the Morse requirement has been astounding. Many of these hams are coming to HF with virtually no experience on these bands regarding propagation, band plans, operating digital modes, chasing DX, net operations and the generally employed "good on-air practices."

❖ Listen In To Fit In

The best way to fit in on HF is to spend more time listening than talking. So, before you start calling CQ on random HF frequencies, tune around on all the bands and note what's happening.

Some bands, particularly 80 meters at night and 20 meters during the daytime, can sound like a free-for-all. Amid the cussing, deliberate interference and ultra wide-band signals from guys trying to sound like the VOA, there are operators who act as though they were bequeathed an operating frequency directly from Marconi's will. With the small amount of operating space for an increasingly large number of operators, it's bound to get worse. You can do your part to see it doesn't.

Get your operating practices up to speed by starting out on less crowded bands. 10, 12, 15 and 17 meters, when they're open, are much more friendly places to start out. Search the bands and find someone calling CQ. Usually the rule is "if you can hear 'em, you can work 'em." But, sometimes that's not the case. Some hams running full legal power (1,500 watts) into a modest antenna will have huge signals, but won't be able to receive stations operating at less than a tenth their power. These stations are euphemistically referred to as "alligators," all mouth, no ears.

Your first dozen or so contacts are crucial. Ask each to tell you how your station sounds. Most hams are critical of other stations' on-air sound. If there's a problem they'll tell you. If a dozen hams tell you your station sounds great, believe it! If more than two comment that you have audio problems or some other issue, ascertain the problem and resolve it before going on. If only one person out of a dozen has a problem with your station, they probably have problems of their own.

Round Table

When you come across a group of hams in a QSO, pay attention to how they're operating. If it's just a "round table" discussion among friends, you'll hear them "pass the mike" from one to the other until it's back to the first. These are usually just a bunch of guys who get together at the same time and frequency each day. Take note of call signs and names while you're listening to help you fit in. Wait until a complete round is finished and, when there's a clear opening, key up and give your call once in proper ITU phonetics. Someone in the group will copy it and announce to the rest that you're standing by. At that time you'll probably be asked to come in and introduce yourself.

Net Control

If it's a "net" operation, there will be a "net control station" (NCS) who will ID as such and identify the net as well. The NCS will usually be a high powered station with a multi-element beam that can be heard by everyone. If you listen long enough, the NCS will ask, "Are there any other stations who would like to join the net? If so, please come now." That's your cue to key up and give your call sign once phonetically. If more than one station calls in, they may ask again. Keep giving your call sign once phonetically until you're acknowledged. Typically, the NCS will assign a sequence to the calls in the order received. They'll go down this list until it's your turn to talk. This orderliness is necessary with 10, 20 or even 30 operators in a net. If you call out of sequence or continue to interrupt, you'll only incur the indignation of the NCS and perhaps a few others on the net.

Forget expensive power draining amplifiers. Put up this inexpensive CushCraft A3s 3 element tri-band beam and be heard everywhere! (Courtesy:Texas Towers)

DX Nets

If it's a DX net operation, it can be a little more tricky. In a DX net, an NCS station – usually stateside – will call for "DX check-ins." That means only hams who have call signs which are outside of the continental U.S. can call in. So, a Canadian, Puerto Rican, Alaskan or Hawaiian ham could call in, but a ham from Key West or Montana could not.

Once the NCS has the DX stations lined up, he or she will say "Anyone wanting to work the DX give me the last two letters of your call." Now, the reason for this is that the NCS is usually very loud and can be heard by everyone, including the DX stations. If he or she announces your full call, it's unfair to the DX station who should be trying to hear your call sign from your station. If they can't, it's considered a "no contact" and they'll move on. If they can hear your signal, you'll exchange reports and you'll have worked that station legitimately for DXCC (worked 100 countries award).

The problem is that the FCC requires you to make a full ID every 10 minutes that you're on the air, but only after you begin your transmission. To accommodate this, NC stations usually take no more than five check-ins at a time. If you check your clock the minute you announce the last two letters of your call, check it again when you're called to make your DX contact. If 10 minutes have not elapsed, you're still within the FCC rules. Since most contacts in a DX net last no more than 60 seconds each, it's easy to get five DX QSO exchanges on the net during a 10 minute period so that every contact is both legal and ethical.

❖ Your First CQ

When you think your operating practices are HF-ready, find a frequency within your license class and monitor it for a few minutes. If there's any interference plus or minus 2 kHz, try moving a little bit one way or the other to make sure you won't interfere with existing QSOs. Key the mike and ask if the frequency is in use and give your call sign phonetically.

Do this three times with a pause of a few seconds between each call. Now give your CQ call. Don't be impatient. If no one calls after the first three or four attempts, wait a minute and do it again. This is particularly true on 10 meters. If the band is open at all, eventually someone will come back to your call. But, to avoid calling yourself hoarse on a dead band, check the beacons. If you can hear any of the beacons for any of the bands, those bands are open. (See feature article on beacons in the May *MT*.)

Digital Modes

Since the overwhelming number of new General Class hams are no-code Generals, I'm going to assume you won't be operating CW. But, if you do, the practice is the same. So, too, for the digital modes, but things can be more critical on digital.

Again, you'll learn more about operating do's and don'ts by monitoring the bands before you add to the confusion. BPSK31 is a fairly high-speed digital mode that is very good for poor band conditions. But, if you don't have your rig set up properly you could be ruining QSOs for everyone around you. That's because most digital modes operate within just a few kHz of each other. For example, most 20 meter PSK31 exchanges happen on 14.070 MHz plus only a few kHz. I've counted as many as 15 individual QSOs happening on one frequency. If your signal is overdriven, you will splatter all over everybody else's signals and incur the wrath of all on the frequency.

The key to operating digital modes (PSK31, RTTY, SSTV, etc.) is to have a clean, narrow signal. To help get the best digital signal on the air that you can, turn off your mike processor, cut back your mike gain, and reduce the power output to no more than 25 or 30 watts maximum. Typically, all you need is 10-20 watts for solid contacts world-wide on 30, 20, 15, 17, 12 or 10 meters. The less power everyone uses in the digital modes, the more stations can be on the same frequency. If you have a friend who can operate this mode, it helps to have a QSO with them during which you can make the necessary adjustments.

❖ Power, I Need More Power!

You won't be long on the bands before you come across the needle bending 30 over 9 signal of a well-heeled ham running extremely processed audio into a super antenna at the legal power limit. You can tell them right away because they're usually plus *and* minus 5 kHz from their operating frequency.

But, fancy rigs, huge amplifiers and massive antennas are a real waste of money. To say nothing about the energy they consume and the

Expensive new rigs will do little more than many older full coverage HF transceivers like this old Kenwood TS-140s which cost a fraction of the price. As a bonus you'll get the best shortwave receiver you've ever owned! (Courtesy: Rigpix.com)

animosity they create on the bands. A simple 160-10 meter 100 watt rig is all the radio you'll need to do everything you want to on HF. A simple all-band wire antenna up high enough will usually be all you need to make contacts throughout the world and even work the DX pile-ups. If you really need to have a presence on the bands, the most bang for the buck can be had with a simple three-element tri-band Yagi beam, such as the CushCraft A3s. At about $560, it will make your station sound like a kW and let you be heard all over the world. The beauty of these antennas is that, unlike amplifiers, they cost nothing to operate.

Over the last few years, during the bottom of the current solar cycle, I've worked 240 DXCC countries using the same old Kenwood TS-140s I started out with in 1988. I use an all-band off-center-fed dipole at 25-ft for 80, 60, 40, 30, 17 and 12 meters. I use the CushCraft A3s on a 30-ft mast which I rotate by hand to operate 20, 15 and 10 meters.

That's it! Nothing fancy needed. Forget the power. Your own patience and increased operating skills will net just as many contacts. And remember, the FCC rules state, "An amateur station must use the *minimum* transmitter power necessary to carry out the desired communications." That means don't use more power than you need to make the contact.

Next month: The New Ham's HF Station check list, how to work the DX, and the art of the QSL.

ASK BOB

GENERAL QUESTIONS RELATED TO RADIO

Bob Grove, W8JHD
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Q. *Lately I have been picking up a weak interference signal 24 hours on both my portable and desktop shortwave receivers between 11 and 15 MHz. It sounds like a rapid up/down pitch "eee-ooo-eee-ooo" like a siren. (Ken Backer, Milton, Ont)*

A. I have heard similar interference signals on my own shortwave receiver, and I've tracked them down. They are usually traced to microprocessor noise in electronic accessories (computers and peripherals, home entertainment radio and TV, telephone answering machines, etc.).

Here are two proven methods to find the interference:

(1) Carry the portable from room to room; when you approach the offending device, the signal will become much stronger. Unplug the suspect to see if the interference disappears; or

(2) In battery mode, tune in the interference on the shortwave portable, then individually switch off and on the breakers on your power panel while listening for the interference to stop. That will isolate the circuit with the offending device, and you can proceed to that area as in (1).

Q. *I have a portable multiband radio that's missing its two telescoping whips, one for shortwave and the other for VHF 30-174 MHz. What would be good choices to use for replacements? (Keith Beesley, email)*

A. Radio Shack stocks replacement antennas for portables, so you can start there with the two empty holes, but you will need to be sure you can attach them properly at their bases and that their girth fits the hole.

The shortwave whip will be the longest one you can get that fits, probably 3-4 feet in length. You could use the same model antenna for the VHF slot, fully extended for 30-50 MHz low band, and compressed to about 18"-24" for the high band. Or, if you're in a typical area where there's very little low band communications, you can simply get another whip that pulls out to that shorter length.

Q. *I have an ICOM R-3 wide-coverage receiver with TV reception. In what states is it illegal to tune in and observe wireless cameras in operation?*

A. To my knowledge it's perfectly legal in any state to watch any wireless video camera signal that's on the air. Radio privacy laws protect voice and scrambling only.

Q. *I have heard that the new fluorescent screw-base light bulbs generate radio interference; is that true?*

A. Yes, but their interference range is limited to a few feet from the bulb. They radiate wideband strongest in the AM broadcast band and gradually less so as the frequency rises into the shortwave range. Indoor listeners shouldn't place a fluorescent bulb near a portable radio's whip, but an outdoor antenna would be well isolated from this noise source.

You can easily test this yourself by placing a portable AM or shortwave radio with its whip near the fluorescent bulb and tuning through the bands.

Q. *Recently I experimented with my VHF/UHF antenna by attaching it to an HF antenna tuner (transmatch) and feeding it to my shortwave receiver. I was amazed that I actually had signal improvement over my much longer shortwave antenna. Does this mean I can scrap the wire and use my VHF/UHF antenna for shortwave? (Anthony Lenzo, Brooklyn, NY)*

A. A receiving antenna does not have to be resonant to work well. The antenna tuner adjusted the mismatched antenna to the 50 ohm impedance of the receiver so that there was very little loss in the line. It also acted somewhat like a preselector, preventing swamping from off-frequency signals.

Decades ago, the U.S. Coast Guard determined that a receiving antenna, properly matched, only needs to be about 5 feet in length to hear virtually 100% of the communications signals. In general terms, an antenna needs only to be long enough to capture enough signal voltage to overcome the receiv-

ing system's own internally-generated noise. Once you have higher signal than that, you gain nothing. It also helps to have directivity in an antenna to null out unwanted co-channel interference and favor the desirable signal.

Shortwave antennas are long, because then they are naturally resonant at impedances which more closely match the nominal 50 ohm input of most receivers.

Q. *The AA batteries that came with my hand-held scanner last a good while, but I'd like some that last longer. Is this just a simple substitution of batteries?*

A. Yes; the scanner will only discharge the batteries at a specific level, regardless of the current capacity of the battery, just so long as it is the same voltage (which all AA cells of the same chemistry will be). Reader Paul McCay recently informed us that he went to an office supply store and found some Duracell NiMH (nickel metal hydride) AA cells to replace his stock batteries and they lasted a whole lot longer. The key is to read the mAH rating on the AA cell; if it's higher, it will deliver power longer.

Q. *I have two shortwave receivers but live in an apartment complex which doesn't allow external antennas. I've managed to put an antenna on a porch, but still get a lot of electrical noise from the apartments. What's the next step? (Jack Feldstein, email)*

A. It sounds as if no matter where you put an antenna, you will pick up electrical noise from the building. This is a case where a noise phase-cancellation device is mandatory. I'd suggest the MFJ-1026 ($189.95) which hooks to your main antenna and also has an input from a random wire noise antenna that is tuned against the receive antenna so the noise can be cancelled out. (*See April 2007 MT Review for advice on how to use this product - ed.*)

Q. *I have seen a couple of posts on your internet Milcom blog (**http://mt-milcom.blogspot.com**) concerning SGLS. What is it, who uses it, what can I hear and what equipment do I need? (Tom Banks-Dallas, Texas via email)*

A. Since the late 1960s the Air Force Satellite Control Network (AFSCN), and other satellite support ground systems, have used transmitting and receiving equipment known as the Space-Ground Link Subsystem (SGLS) to provide command and control links with orbiting space vehicles. SGLS, over its nearly three decades of service, has effectively become a defacto standard for satellite tracking, telemetry reception, and commanding (TT&C).

The AFSCN is a global configuration of common user and dedicated control nodes and space/ground link resources whose mission is to support space vehicle telemetry, tracking, and control (TT&C) requirements and to receive, process and disseminate mission data for a variety of operational DoD space systems.

AFSCN currently is supporting 170-plus DoD, Civil and NRO satellite launch and satellite operations in surveillance, navigation, communications and weather. The primary space/ground link resources include nine remote tracking stations (RTS) supporting 16 antennas that operate at S-band using the Space-Ground Link Subsystem.

Although most TT&C operations are provided by fixed sites, the Air Force also uses transportable SGLS-compatible earth stations to provide additional coverage during launches, early orbit operations, anomaly resolution, and critical orbit insertion maneuvers.

The band plan for SGLS comprises 20 discrete channel pairs beginning at 1763.721 MHz and ending with 1839.795 MHz. Each channel is 4.004 MHz wide. These 20 channel pairs (see table below) consist of one uplink and two downlink carriers.

The downlink is transmitted at 1.024 Mbps and uplink rates are 2 kbps. In one type of SGLS system, a subcarrier is modulated by an information signal using BPSK or QPSK modulation. Then the composite signal phase modulates the primary carrier. SGLS provides its users with range, range rate, telemetry and mission data.

Data traffic that uses SGLS includes secure voice or data; image dissemination, intelligence collection, telemetry and command relay, mission data relay, and computer-to-computer data transfer.

Channel No	Uplink (MHz)	Downlink (MHz)
Channel 1	1763.7210	2202.5
Channel 2	1767.7250	2207.5
Channel 3	1771.7290	2212.5
Channel 4	1775.7320	2217.5
Channel 5	1779.7360	2222.5
Channel 6	1783.7400	2227.5
Channel 7	1787.7440	2232.5
Channel 8	1791.7480	2237.5
Channel 9	1795.7520	2242.5
Channel 10	1799.7560	2247.5
Channel 11	1803.7600	2252.5
Channel 12	1807.7640	2257.5
Channel 13	1811.7680	2262.5
Channel 14	1815.7710	2267.5
Channel 15	1819.7750	2272.5
Channel 16	1823.7790	2277.5
Channel 17	1827.7830	2282.5
Channel 18	1831.7870	2287.5
Channel 19	1835.7910	2292.5
Channel 20	1839.7950	2297.5

You can find some excellent S-band equipment recommendations on one of the best websites on the internet for space monitoring information at **www.uhf-satcom.com/sband/**. If you want to sleuth many of the world's military satellites, then prowling the SGLS network frequencies is the place to explore.

Q. *Can you provide website(s) for "A" and "K" indices plus Solar Flux given hourly on WWV? My condo antenna situation is limited, the audio for this on WWV is not as clear as the time announcements, plus with QRM and QRN it is quite difficult to hear the report, usually on 15 MHz and sometimes on 20 MHz late in the day. (Everett F Seidenberg, AG4UM, Stuart, FL)*

A. My favorite site on the internet is run by frequent *MT* contributor Tomas Hood at **http://propagation.hfradio.org/**.

There are plenty of links there to other sites on the internet. Speaking of links, the best place on the net to find anything involving amateur radio is Rodney Dinkins AC6V's Amateur Radio and DX Reference Guide. You can find this site at **www.ac6v.com/**

Q. *My Uniden 246T, while ID scanning my local Public Safety, seems to skip every few seconds after conversation begins on the channel. Is this due to a setting? Please help. (Chris Witczak via email)*

A. Sounds like you have the priority setting selected. While scanning a conventional system, the scanner interrupts every 2 seconds and checks the priority channels in each unlocked conventional system. Priority channels in lower priority key numbered systems (starting from 1) have highest priority. Look for "Pri" on your screen as it appears when you select this mode.

Q. *Do you have any air-to-air or any other frequencies for the Hawaii Air National Guard? (Greg Brazil, San Francisco, CA)*

A. Here is my latest listing for Hickam AFB, Hawaii, from the *Grove Military Frequency Directory:*

141.8000	USAF Command Post
225.4000	USAF Air Traffic Control Training
236.6000	USAF/FAA Ground Control/Ramp Advisory
238.3000	USAF Air Traffic Control Training
239.0500	FAA Approach/Departure Control
251.1500	USAF/FAA ATIS
251.2500	USAF Squadron Common
252.8000	USAF Search and Rescue (SAR)
257.8000	USAF/FAA Tower
269.0000	FAA Approach/Departure Control
270.4000	USAF Ground Controlled Approach
273.5750	FAA Tower ex-267.900 MHz
276.0000	USAF Tower
281.4000	FAA Clearance Delivery
285.4000	FAA As Assigned
292.5000	USAF Command Post
293.7000	USAF 203ARS Operations Hoku Ops
300.1000	USAF Air-to-Ground Contingency
300.6000	USAF Air-to-Ground Contingency
305.4000	USAF ANG Operations
311.0000	USAF ACC Command Post
317.6000	FAA Departure Control
319.6000	USAF Air-to-Ground Contingency Discrete
321.0000	USAF ACC Command Post
327.4000	USAF Air-to-Ground
337.4000	USAF ANG Command/Control Tactical
338.2000	FAA Approach/Departure Control
339.2000	USAF Air-to-Ground
346.6000	USAF Metro
348.6000	FAA Ground Control
349.4000	USAF AMC Command Post
354.2000	USAF ANG Ground Controlled Intercept
372.2000	USAF Pilot-to-Dispatcher (PTD)
396.9000	USAF Ground Controlled Approach

Q. *In amateur radio, when operating SSB, lower sideband (LSB) is used on the 40M band and below while upper sideband (USB) is used on the 20 meter band and higher. Do commercial users of SSB follow the same or similar type of USB/LSB selection for ordinary voice traffic? (Anonymous via Eric and the UDXF newsgroup)*

A. In short – No! For the most part, USB will reign supreme in the HF utility bands. There are a few U.S. government entities that will use LSB – FEMA and MARS come to mind. But if you tune in USB you will catch the great bulk of the voice traffic on HF.

SCANNING REPORT
THE WORLD ABOVE 30MHZ

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Back to Scanner School

September is back-to-school month around here, and one of the first things covered in the classroom is a review of previous material. We discuss trunked radio systems here on a regular basis, but the technology is a constant source of confusion for many readers.

Dear Dan,

I just recently purchased a PRO-97 1000-channel triple trunking handheld scanner and I am having trouble figuring out how to program the trunked frequencies. I just read your articles on trunking and I understand a little more but not enough to program my scanner.

My questions are

1. What is a control channel and how do I know where to find it?

2. I'm trying to listen to fire and police on their trunked systems. How do I program the scanner?

Any help you can offer will be greatly appreciated!

Mark via the Internet

Trunked radio systems use a group of radio frequencies to carry conversations between radios and one or more repeater sites. Repeater sites receive transmissions from radios on their input frequency and transmit them back out on their output frequency, thus *repeating* the conversation for each user to hear. Scanners typically tune to the output frequency of repeater sites, since those signals are usually the strongest. The combination of input and output frequencies is called a *channel pair*, or *channel* for short.

In addition to repeating voice traffic, repeater sites also continuously transmit a separate signal, called a *control channel*. The outgoing (output) control frequency carries instructions and information from the *system controller* out to radios. The incoming (input) control frequency carries requests and acknowledgments from radios in to the system controller. When a radio is not involved in a conversation, it tunes to the control channel and listens for instructions from the system controller.

Conversations on a trunked radio system are organized into *talkgroups*. Each radio is programmed with one or more talkgroup identifiers,

Trunked System Channels
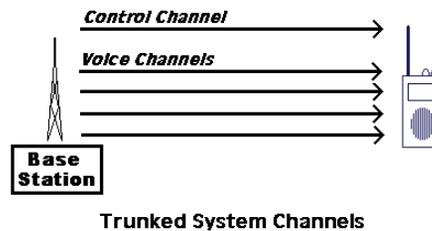
making the radio a member of those talkgroups. When a conversation begins, the system controller selects a radio channel to carry the voice traffic and then sends out a message on the control channel containing the talkgroup identifier and the assigned radio channel. Radios listening to the control channel hear that message and check to see if they are programmed with the talkgroup identifier. If so, they tune to the radio channel and begin participating in the conversation.

So, in order for a scanner to follow a trunked radio conversation, it should monitor the control channel the same way a user's radio would. This means it should also tune to the control channel and listen for messages from the system controller.

This takes us to the second part of Mark's first question: where do you find control channel frequencies?

Prior to the Internet, the most common source of frequency information was guidebooks such as the now-discontinued *Police Call*. These types of books contained license and frequency data from the Federal Communications Commission (FCC) as well as monitor reports from fellow hobbyists.

These days, web sites and electronic user groups have largely replaced guidebooks. These resources are organized in a number of ways, most commonly by geographic area. One of the most comprehensive websites for trunked radio information is Radio Reference at **www.radioreference.com**. Readers from across the country (and some from other countries) submit frequency and talkgroup information for their local area. The Radio Reference database is organized geographically by country, state and county, so you can zero in on systems in your local area.

Many areas of the country also have electronic user groups dedicated to monitoring local systems. Going to **groups.yahoo.com** and

searching for scanning groups will bring up a number of possible choices for you to subscribe to. Each Yahoo! group has an archive of old messages as well as a file section, allowing you to research old discussions and review documents other members have shared. There are also groups dedicated to specific scanners, so help and advice on particular models are also available.

The Radio Shack PRO-97 is a recent vintage handheld scanner capable of tracking the three most common trunked radio systems (Motorola, EDACS and LTR). The instruction manual describes how to program trunking frequencies beginning on page 67. If you don't have a copy of the manual, Radio Shack maintains electronic versions for most of their scanners on their web site at **www.radioshack.com**. If the manual still doesn't help or you're still confused, joining the PRO-97 Yahoo! group at **groups.yahoo.com/group/Pro-97/** will give you the opportunity to ask more than 3,700 members for assistance.

❖ Henry County, Virginia

This June, Henry County in southern Virginia took the next step in updating their radio system by voting to award a $5.2 million contract to Motorola. As with most radio system upgrades these days, the Henry County contract is intended to improve coverage by eliminating "dead zones" and improve reliability by replacing old, outdated equipment. When the contact is complete next year, the 20-year-old Henry County system will be retired.

Henry County is located on the border with North Carolina and is home to about 58,000 people.

The Henry County vote provided an interesting insight into the competing factors faced by local officials making these kinds of contracting decisions. During the public hearing related to the vote, supporters of the second-place bidder, M/A-COM, made a number of points relative
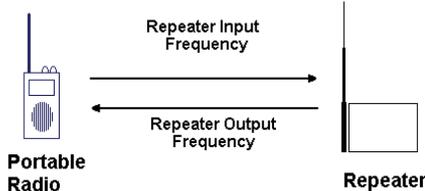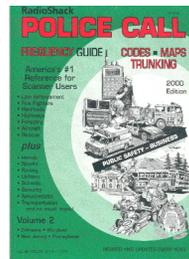
to Motorola and requested a re-examination of each bid. Their arguments boiled down to two basic issues: first, M/A-COM has a facility in Virginia, while Motorola does not. How much weight should the County give to keeping money within the State? Second, and more compelling, is the fact that the M/A-COM bid included newer Internet Protocol (IP) technology while Motorola offered older analog equipment. Is newer always better? Is equipment touted as "future-ready" worth buying even if the County doesn't immediately need it?

County Board members responded by pointing out that Motorola was the lowest bidder and was understood to have proposed a system that came the closest to meeting all of the County's needs. While newer technology was nice, it wasn't clear that it would be the best value for the County at this time.

Local public safety representatives pushed for action rather than further study, arguing that the dead zones and unreliable equipment are putting residents at risk and should be remedied as soon as possible.

Until the new system is in place, you can hear county activity on the following frequencies:

Frequency	Description
39.50	Sheriff
39.54	SIRS Channel
154.180	Fireground
154.250	Fire (Dispatch)
154.265	Fireground
154.295	Tactical
154.815	Sheriff
155.070	Sheriff (Jail)
155.205	Emergency Medical Service
155.220	Emergency Medical Service
155.235	Emergency Medical Service
155.280	Emergency Medical Service
155.340	Emergency Medical Service (Hospital)
155.520	Parks and Recreation
155.610	Sheriff (Dispatch)
155.670	Sheriff (Car to Car)
155.865	Emergency Medical Service (Dispatch)
453.200	Service Authority (Water)

❖ Haverhill, Massachusetts
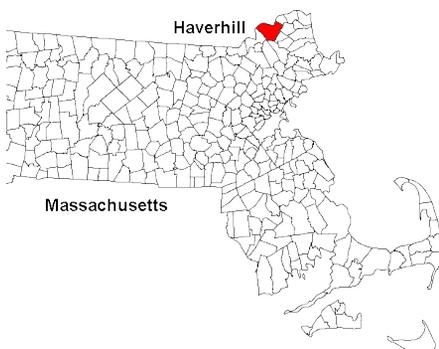
The town of Haverhill, Massachusetts, home to nearly 59,000 people, has voted to spend $36,000 on two dozen new digital radios. These will replace older radios in the town's 55 police cruisers. The new radios will be paid for through a federal government grant.

Police officials have indicated that one reason for the change is to prevent citizens
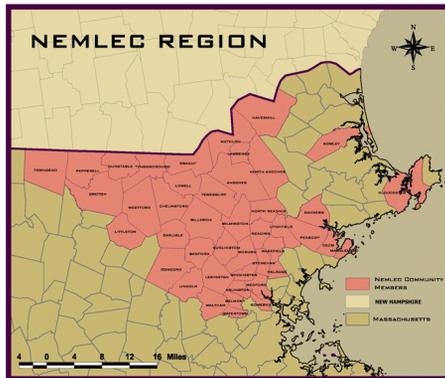
from overhearing police conversations. Haverhill currently has the capability of using a technique called *voice inversion scrambling* on their analog equipment. This technique breaks up the voice spectrum into separate blocks, then switches the blocks around. The simplest form of the technique uses only two blocks – low frequencies and high frequencies – and transmits them oppositely, causing the speech to sound like "Donald Duck." Voice inversion scrambling isn't terribly effective in actually hiding the contents of a conversation. Listeners can still make out the basic structure of sentences and with a little practice can make out common words and phrases. There are also after-market devices available (*illegal to sell, but simple to make - ed.*) that can reverse the inversion and restore the normal speech.

Current frequencies in use in and around Haverhill by public safety agencies include:

Frequency	Description
154.0100	Haverhill Fireground
154.3625	Haverhill Fire
460.0875	Haverhill Police
470.3375	Sheriff
470.9250	Haverhill Police
482.5875	Sheriff
482.8875	Sheriff (Jail)
482.9125	Sheriff (Transportation)

Another reason given for the move to digital radios is interoperability, or at least commonality, with nearby towns. Haverhill, like many other jurisdictions in Essex and Middlesex Counties, is gradually migrating to digital service, although they will continue to transmit messages in analog form until all of their radios can be updated.

Thirty law enforcement agencies in Essex and Middlesex Counties are members of the North Eastern Massachusetts Law Enforcement Council (NEMLEC). NEMLEC members are gradually switching to digital radios and share the following frequencies:

Frequency	Description
482.3875	Tactical 4 (Unit-to-Unit)
482.6375	Tactical 3 (Project 25)
482.6875	Tactical 2 (Areawide)

❖ Levy County, Florida

In Levy County, Florida, the small town of Williston, population 2,300, is not joining other local towns in moving to a new county radio system. Currently the county and the town operate independent VHF (Very High Frequency) radio equipment.

The Levy County Commission recently voted to spend $1.5 million for new radio equipment, putting the County on the path to join the State Law Enforcement Radio System (SLERS). The county provided a grant of $25,000 to each municipality for communications upgrades. The towns of Cedar Key, Chiefland, and Inglis will change their police equipment, at a cost of about $4,000 for each portable and mobile radio.

Williston currently dispatches their own police and fire departments and has decided that they're happy with their VHF system and will not be joining SLERS. Communication with the county and other local agencies will be done through the dispatcher via telephone. The city is concerned that there may not be enough local capacity on the SLERS network, leaving their police officers unable to use the system in an emergency. City officials also doubt that the M/A-COM system is as reliable as a competing Motorola system.

In spite of these concerns, Williston may use their county grant to begin to phase in 800 MHz radios by purchasing one or two mobile radios and a few portables for police use. This would allow them to try out the SLERS system and make immediate communication with nearby agencies easier without having to commit to switching over. Williston may also try to purchase Motorola equipment if it is compatible with the SLERS M/A-COM infrastructure.

Until the County switches over, you can hear local activity on the following frequencies:

Frequency	Description
154.040	Williston Police
154.055	County Road Department
154.770	Sheriff Dispatch
154.965	County Fire Dispatch (North)
155.235	County Emergency Medical Service (Dispatch)
155.490	Sheriff (Talk-Around)
155.625	County Fire Dispatch (West)
155.700	Sheriff Dispatch
155.880	County Fire Dispatch (South)
155.985	County Fireground (Simplex)
159.255	Williston Fire

SLERS is an unusual partnership between the State of Florida and equipment provider M/A-COM. Due to the enormous cost of building such a large and comprehensive statewide network, both parties agreed to have M/A-COM own and operate the network. In exchange, M/A-COM receives funding from the State and from other users of the network. The State oversees the operation and maintenance of the network, ensuring that it is performing within acceptable bounds.

Because each municipality joining SLERS only needs to purchase the radio equipment they will use, the cost of upgrading to a new 800 MHz system is far less than if each county or large city had to build their own individual network.

SLERS is based on EDACS (Enhanced Digital Access Communications System) technology from M/A-COM. However, there are a couple of problems with monitoring this network.

The first problem for scanner listeners is that the control channel in SLERS uses an optional EDACS product called ESK (EDACS Security Key). ESK allows the system operator (M/A-COM, in this case) to implement a security code in radios and repeaters. This security code is used to scramble the contents of the control channel. In order for the control channel to be understood correctly, the security code in each radio must match the code in each repeater site. Although this feature was originally intended to prevent stolen or otherwise suspect EDACS radios from being used on different networks, it has the additional effect of preventing trunk-tracking scanners from correctly interpreting the control channel. It does not affect voice channels, so scanner listeners are still able to hear individual transmissions.

The second problem is that SLERS uses extended EDACS addressing. Standard EDACS can handle up to about 16,000 unique radio identifiers and about 2,000 talkgroups. Since SLERS is intended to support many more radios and much more activity across the state, it uses a different control channel message format to handle as many as one million unique radios and about 65,000 talkgroups. Unfortunately, scanners do not understand the extended addressing message format.

The SLERS tower in Levy County is licensed for the following frequencies, in Logical Channel Number (LCN) order:

LCN	Frequency
01	853.8500
02	854.0625
03	854.1875
04	857.2625

❖ Battle Creek, Michigan

Despite careful planning, new radio systems don't always provide the service needed. Police in Battle Creek, Michigan, have filed a formal complaint about the performance of the city's $4 million radio system.

Battle Creek is a city of about 54,000, and is best known as the home of cereal makers Kellogg and Post. Back in March, the city, along with the Calhoun County Sheriff Department, Emmett Township and Springfield, moved from their old VHF system to the Michigan Public Safety Communications System (MPSCS). MPSCS is a statewide digital radio network operating in the 800-MHz band.

The police complaint revolves around lack of coverage, especially for officers using portable radios. Dispatchers apparently have difficulty hearing transmissions from the relatively low powered radios in certain locations. There are also locations where officers have a difficult time receiving the dispatcher. This reflects a serious and dangerous situation, according to the Battle Creek Police Department, and has the overall effect of reducing the trust police had in their radios.

Technicians from Motorola, the contractor and equipment provider for MPSCS, have been working with local and state officials. While the situation is being addressed, Battle Creek officers will have their old VHF radios as backup.

While the MPSCS problems get worked out in Battle Creek, check these VHF frequencies for activity:

Frequency	Description
154.250	Fire (Dispatch)
154.295	Fire (Department of Natural Resources)
154.755	Police
155.160	Emergency Medical Service
155.220	Emergency Medical Service
155.370	Police (Intersystem)
155.865	Michigan Emergency Police Service Station (Statewide)
156.105	Multi-County Public Safety Intersystem
156.150	Police (Neighborhood Teams)
159.030	Police
159.210	Fireground
453.375	Police (Parking)
453.650	Department of Public Works
453.975	Transit Authority

The MPSCS operates a repeater site in downtown Battle Creek on the following frequencies: 866.2125, 866.7875, 867.3125, 867.7125, 868.0500 and 868.9875 MHz. There is another tower to the east of the city, transmitting on 866.6000, 866.8750, 867.0875, 867.3750, 867.8750, 868.3750 and 868.8750 MHz.

Unfortunately, much of the Battle Creek Police Department activity on the MPSCS network is encrypted, so even with a digital scanner you probably won't have much luck hearing them.

Decimal	Hex	Description
3025	BD1	County Law Enforcement Information Network
3037	BDD	Battle Creek Police (Narcotics)
3077	C05	County Narcotics Enforcement
3235	CA3	Central Police Dispatch (Patched with 155.535 MHz)
3248	CB0	Battle Creek Police (S.I.U.)
3866	F1A	County Fireground
3875	F23	Battle Creek Police (Dispatch)
3876	F24	Battle Creek Public Safety
3877	F25	Battle Creek Public Safety
3879	F27	Battle Creek Public Safety
3881	F29	Battle Creek Public Safety
3897	F39	Battle Creek Public Safety
3913	F49	Sheriff

❖ Val D'Or, Quebec, Canada

Hi,

I am living in Abitibi, at Val-d'Or. I would like to know if the function Trunk Tracking III on the BC-246T that I want to buy will be useful in Val D'or. Is there a trunk-tracking system in Val-d'Or? If not, would it be better to buy it anyway or if I can't use the Trunk Tracking III should I buy another handheld scanner?

Alexandre in Abitibi

Val d'Or (Valley of Gold) is a city of about 32,000 people in the southwestern part of the Canadian province of Quebec, about 400 kilometers northwest of Ottawa.

The Uniden Bearcat BC-246T is a handheld trunk-tracking scanner introduced in 2004. It is capable of following analog conversations on Motorola, EDACS and LTR networks. It is not capable of tracking or monitoring transmissions that use digital voice technologies.

Unfortunately, I don't have any information regarding trunked radio systems in Val d'Or, or Quebec in general. If any readers are near Val d'Or and have frequency information for Alexandre, please send me an e-mail and I'll put you in touch.

That's all for this month. You can get more frequencies and radio-related information on my website at **www.signalharbor. com** and I welcome your electronic mail to *danveeneman@monitoringtimes.com*. Until next time, happy scanning!

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http://mt-utitlity.blogspot.com

PC-HFDL: A Good Program Gets Better

In early July, a new beta version appeared for one of the High-Frequency Data Link (HFDL) decoding programs discussed in the June column. The author, ace programmer and generally smart guy Charles Brain, G4GUO, submitted it to the exact people guaranteed to give it a real test. These were, of course, the hard-core HFDL monitors on the Yahoo group at **http://groups.yahoo.com/group/hfdl/** .

The new version is PC-HFDL 2.04, for Windows XP (no Vista yet). So far, it seems like a major improvement. I didn't have the startup problem reported by others, where the pchfdl.ini file in the beta distribution attempted settings that not all sound cards would do. I saved my old initialization file in case the installer overwrote it, but it didn't.

I checked out the program on a lot of Pacific flights working Molokai on 11312.0 kilohertz (kHz), upper sideband (USB). The user interface is nearly the same, but some definite improvements are evident "under the hood." The decoder works a bit better. The "squitters" look the same, but they're handled a little more nicely. According to Charles, the acquisition of the new system table should work much better when the time comes.

The most visible difference comes if you're using Google Earth. This application is now supported for plotting aircraft positions obtained with the program.
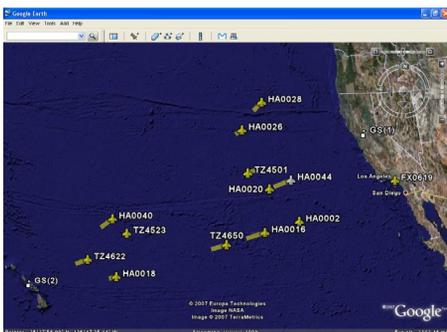
The implementation is very basic, but slick. According to Charles, PC-HFDL formats the position data recovered from the HFDL transmissions into Google Earth's Keyhole Markup Language (KML). These are written to a file, then Google Earth is instructed to load it, plus another one with the coordinates and likely frequencies of the ground stations.

If you've detected any airplanes, Google Earth will swing around dizzily, and happily display the positions and flight numbers. It's also fun, of course, to zoom in on the ground stations. I highly recommend looking at San Francisco/Dixon, station 01. High resolution images of the Dixon area have recently been added, and the coordinates put you right in the middle of the old Voice of America site now being used by the HFDL station and Globe Wireless. While you're there, look immediately southwest for a nice US Navy setup. (Also see June issue for VOA Dixon pictures - ed.)

As new aircraft are plotted, Google Earth is updated to show them, sometimes again with dizzying results. Certain pairs of coordinates jump the plot to Africa, though I quickly learned to stop this with a quick mouse grab. I did have one plane show up (accurately) on the runway of the Lima, Peru, international airport, and another right at the departure end of Los Angeles International (LAX) runway 24 Left. It's nice to have the detailed images!

Just one bit of advice, though. Don't forget to delete all the airplane positions from your temporary placemarks when you close Google Earth. Otherwise, they will come up next time, filling up your placemark list and generally confusing everything.

In my own opinion, the improvements to PC-HFDL are worth it. A good program just got better.

❖ VHF HFDL Counterpart Now Active

In response to our June column, Larry Major, KB3KAK, writes as follows:

"Actually, the new ACARS *[Aircraft Communication Addressing and Reporting System]* has been in service since 2002/2003; it is known as VHF *[Very High Frequency]* Data Link (VDL) Mode 2. It uses a CSMA *[Carrier Sense Multiple Access]* D8PSK *[Eight-Ary Differential Phase-Shift Keying]* waveform. Both ARINC *[Aeronautical Radio, Incorporated]* and SITA *[ARINC's European counterpart]* have implemented VDL Mode 2 networks in parallel with their traditional ACARS networks in much of the world. Around the world some 2200 commercial (40 airlines) and military aircraft have already transitioned to ARINC's VDL Mode 2, sending some 3 million messages a month."

Larry cites an ARINC press release dated June 20, 2007. It reads, in part:

"VDL Mode 2 provides expanded radio channel capacity, vitally needed for Aeronautical Operational Control (AOC) and Air Traffic Control (ATC) data link services in much of the world's crowded airspace... The expanded bandwidth of VDL Mode 2 – ten times that of ACARS – allows ARINC to offer a whole new range of flight information and AOC applications for airlines, including graphical weather, electronic charts, and engine/aircraft health monitoring programs. VDL Mode 2 also supports traditional ACARS data link applications via a hybrid service known as AOA, or ACARS Over AVLC (Aviation VHF Link Control)."

The full release is at **www.arinc.com/news/2007/06-20-07.html**. We thank Larry for this clarification of what's going in the VHF portion of ARINC's GLOBALink service, which also integrates satellites and HFDL.

❖ XSS is TASCOMM?

Last month, we wrote about the identification of the once-mysterious "XSS" net as the new military communications system for the United Kingdom (UK). This active Automatic Link Establishment (ALE) network became active some months back, but it was only recently identified from traffic and signal characteristics.

XSS is the ALE address of the most active station, perhaps a headquarters or control point. All other stations so far also have 3-letter addresses beginning in X, except for two E-3 Airborne Warning And Control System (AWACS) aircraft. These are UKE306 and UKE307 – United Kingdom E-3s number 6 and 7.

There's been a lively discussion on the precise scope of the XSS net. It is either the entire system, known as the Defence High Frequency Communications Service (DHFCS), or a subnet called Terrestrial Air Sea Communications (TASCOMM).

Michael, DH5FAU, might have an answer. He logged XSS calling itself "TASCOM" in an ALE Automatic Message of the Day (AMD) text. Many agencies pass little operator-chatter type strings in this field.

These are the kinds of details which can provoke a great deal of discussion within the utility community. Perhaps we now have an answer, and XSS is TASCOMM. Stay tuned, as they say.

While we're on the subject of "XSS," we'd also like to thank *MT*'s own Larry Van Horn, who supplied most of the callsigns and frequencies mentioned last month. This is some good work. See you in another month, and enjoy the fall DX!

ABBREVIATIONS USED IN THIS COLUMN

AFB	Air Force Base
ALE	Automatic Link Establishment
AM	Amplitude Modulation
ASCII	American Standard Code for Information Interchange
CAMSLANT	Communication Area Master Station, Atlantic
CW	On-off keyed "Continuous Wave" Morse telegraphy
DEA	US Drug Enforcement Administration
E03	UK MI6/SIS, musical callup and female voice
E10	Israeli intelligence/military, female phonetic voice
E11	Unknown "Strich" family, null-message format in English
E25	Unknown, possibly Egypt, irregular music and messages
EAM	Emergency Action Message
EOC	Emergency Operations Center
FAX	Radiofacsimile
FBI	US Federal Bureau of Investigation
FEC	Forward Error Correction
FEMA	US Federal Emergency Management Agency
FM	Frequency Modulation
HFDL	High-Frequency Data Link
HF-GCS	High-Frequency Global Communication System
JSTARS	Joint Surveillance Target Attack Radar System
LSB	Lower Sideband
M08a	Cuban 3-msg CW/MCW, ANDUWRIGMT = 1-0
MARS	Military Affiliate Radio System
MCW	Modulated CW, also Morse tones in AM
MX	Russian single-letter CW cluster propagation beacons
NASA	US National Aeronautics and Space Administration
NPHRN	National Public Health Radio Network
RTTY	Radio Teletype
SHARES	Shared Resources (US Government)
SITOR-B	Simplex Telex Over Radio, FEC teleprinting mode
Unid	Unidentified
US	United States
USCG	United States Coast Guard
UK	United Kingdom
V02a	"Atencion" Spanish numbers, 3-msg format
VHF	Very High Frequency

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Universal Time). "Numbers" stations have their ENIGMA (European Numbers Information Gathering and Monitoring Association) designators in ().

60.0	GBZ-New UK standard time signals, Anthorn, at 2338. (Ary Boender-Netherlands) [Replaces closed MSF Rugby site. - Hugh]
75.0	HBG-Standard time signals, Prangins, Switzerland, at 2340. (Boender-Netherlands)
77.5	DCF77-Standard time signals, Mainflingen/Frankfurt, Germany, at 2341. (Boender-Netherlands)
129.1	DCF49-European power grid control, Mainflingen, Germany, ASCII at 1120. (Boender-Netherlands)
135.6	HGA22-European power grid control, Lakihegy, Hungary, ASCII at 1634. (Boender-Netherlands)
139.0	DCF39-European power grid control, Burg, Germany, ASCII at 1118. (Boender-Netherlands)
147.3	DDH47-Deutsche Wetterdienst (German Weather Service), RTTY marker at 0023. (Boender-Netherlands)
2474.0	PBB-Dutch Navy, Den Helder, Holland, RTTY marker, also on 4280, at 1347. (Boender-Netherlands)
3150.0	PCD-Israeli intelligence (E10), AM callup and message, simulcast on 3270, at 0235. (Boender-Netherlands)
3341.0	MW5FEM-FEMA Region 5, ALE sounding at 1149. (Ron Perron-MD)
3782.0	CTP-Portuguese Navy, RTTY marker with notice that "ship shore not available," at 0042. (Boender-Netherlands)
3855.0	DDH3-German Weather Service, FAX chart at 1159. (Boender-Netherlands)
4070.0	GYA-UK Royal Navy, Northwood, FAX weather charts, supposed to be on 4610 kHz, at 2029. (Boender-Netherlands)
4506.0	Unknown-Various US Civil Air Patrol pilots, checking in with North Central headquarters net at 0145. (Jeff Seale-KY)
4610.0	GYA-UK Royal Navy, FAX weather charts, back on the regular

	frequency after two days on 4070, at 0826. (Boender-Netherlands)
4724.0	Yale Man-US Military, with a 28-character EAM simulcast on 8992 and 11175 HF-GCS, at 0131. (Jeff Haverlah-TX)
4757.0	KEY798-US Environmental Protection Agency, ALE sounding, also 4442, 10202, 13488, and 20659, at 2053. (Perron-MD)
5058.5	SE-FBI, Seattle, WA, calling AN1, Anchorage, AK, ALE at 0904. (Mark Cleary-SC)
5339.0	KPA2-Israeli intelligence (E10), AM callup only, at 0219. (Boender-Netherlands)
5343.0	Z57B-UK Royal Cadets, annual radio contest at 2132. (Boender-Netherlands)
5598.0	New York-North Atlantic air route net A, working airliner Delta 114, at 0514. (Seale-KY)
5711.0	Cape Radio-US Air Force, Cape Canaveral Air Force Station, FL, working NASA Booster Recovery Director and Booster Recovery Vessel Freedom Star, before shuttle launch, at 2244. (Cleary-SC)
5732.0	Hammer-US Customs, CA, giving VHF working channel to Omaha 3MR for a helicopter and USCG Cutter Confidence, at 0113. (Cleary-SC)
5746.0	Lincolnshire Poacher-UK Intelligence, Cyprus (E03), message in progress, parallel 6959 and 9251, at 2223. (Boender-Netherlands)
5778.5	R26611-US Army helicopter, calling B1Z171 (1-171st Aviation), ALE at 1922. (Cleary-SC)
5820.0	WGY9030-Unknown FEMA, working WGY9025, and OH5, Dayton, OH, on the NPHRN net, at 1426. (Jack Metcalfe-KY)
5821.0	WGY901-FEMA Region 1, Maynard, MA, calling the net with WGY963 (VA State EOC, Richmond), WGY941 (ME State EOC, Augusta), and WGY902 (New York, NY), at 1501. (Metcalfe-KY)
5833.5	G23691-US Army helicopter, calling STPOPS, Army Aviation Support Facility, St. Paul, MN, ALE at 0219. (Cleary-SC)
5901.0	USDAEOC2-US Department of Agriculture alternate EOC, ALE sounding at 2104. (Metcalfe-KY)
6314.0	NMF-USCG, Boston (remote to CAMSLANT, VA), SITOR-B maritime safety information, at 0208. (Seale-KY)
6586.0	New York-Caribbean air route net B, working airliner Jet Blue 707, at 0518. (Seale-KY)
6661.0	Northwest 170-Airliner with HFDL position for ground station 04, Riverhead, NY, at 0204. (Seale-KY)
6694.0	Halifax Military-Canadian Forces, NS, coordinating data transmissions with submarine Corner Brook, at 0357. (Michael Lovell-Canada)
6697.0	Rent A Car-US military, EAM at 2240. (Cleary-SC)
6824.0	ABC2-Israeli intelligence (E10), AM test callup at 2148. (Boender-Netherlands)
6840.0	JSR2-Israeli intelligence (E10), AM callup only at 0234. (Boender-Netherlands)
6855.0	Cuban Spanish AM female "numbers" (V02a), callup 49321 41503 20513, at 2102. (Cam Castillo-Panama)
6908.5	294-US Defense Logistics Agency, Columbus, OH, calling TEST001DLAGLOB (presumably DLA Global test), ALE at 1633. (Perron-MD)
6910.0	R23354-US Army helicopter, calling T12CAB (12th Combat Aviation Brigade), ALE at 0214. (Cleary-SC)
6911.5	R23008-US Army helicopter, calling KMUING, Muir Army Air Field, ALE at 0035. (Cleary-SC)
6985.0	R23732-US Army helicopter, calling T12 (12th Aviation), ALE at 1130. (Cleary-SC)
7038.7	"D"-Russian Navy CW cluster beacon (MX), Odessa, at 2050. (Mike L-West Sussex, UK)
7038.8	"P"-MX, Kaliningrad, CW at 2051. (Mike L-UK)
7038.9	"S"-MX, Arkhangelsk, CW at 2051. (Mike L-UK)
7039.0	"C"-MX. Moscow, abnormal CW format repeating "C" 5 times, then Cyrillic Morse character "dah dah dah dit" once, at 2052. (Mike L-UK)
7300.0	WRCCBUFFALO-US National Power Grid, NY, sounding in LSB ALE at 2137. (Perron-MD)
7337.0	Lincolnshire Poacher (E03), message in progress, parallel

9251 and 12603, at 2126. (Boender-Netherlands)

7361.5 T12-US Army, calling helicopter R26860, ALE at 2138. (Cleary-SC)

7527.0 Panther-DEA, Bahamas, working USCG Rescue 33 on a search, at 1357. (Cleary-SC)

7703.0 "Foxtrot-0-Sierra"-Probable US Navy, with four EAMs at 0125. "Kilo-2-Yankee"-US military, repeated three of the EAMs, at 0135. (Haverlah-TX)

7880.0 DDK3-German Weather Service, FAX chart at 1159. (Boender-Netherlands)

7896.0 Cuban AM "numbers," (V02a), new voice, in progress at 2006. (Castillo-Panama)

7903.5 AL1-FBI, Albany, NY, calling IP1, Indianapolis, IN, ALE at 1700. (Cleary-SC)

8023.0 003CDCH09-US Centers for Disease Control, ALE sounding on NPHRN, at 1359. KEY798-US Environmental Protection Agency, ALE sounding on NPHRN, at 2248. (Perron-MD)

8040.0 GYA-UK Royal Navy, FAX weather charts at 1249. (Boender-Netherlands)

8040.0 TF131-AL National Guard 1-131st Aviation Company "F," Birmingham, ALE sounding at 1710. (Perron-MD)

8056.0 297-US Defense Logistics Agency, Philadelphia, PA, calling 294 (OH), ALE at 1445. (Perron-MD)

8097.0 Cuban MCW "cut numbers" (M08a), 5-letter groups in progress at 1833. (Castillo-Panama)

8181.5 R26881-US Army helicopter, calling KALBNG, Albany, NY, ALE at 0124. (Cleary-SC)

8181.5 T3Z238-MI National Guard 3-238th Aviation, calling MAVNSR, unknown Guard unit, ALE at 1428. T3Z238, calling MIC51NG, 51st Weapons of Mass Destruction Civil Support Team, Augusta, MI, ALE at 1504. (Perron-MD)

8280.0 BRIFFR-Venezuelan Navy River Base, calling PNME5 (Venezuelan Navy, Rio Meta), LSB ALE at 0153. (Perron-MD)

8500.0 PR1-Venezuelan Navy Radio Station #1, calling PR4, ALE at 2246. (Perron-MD)

8912.0 33C-US Joint Task Force, setting radio guard with Panther, Bahamas, at 1448. (Cleary-SC)

8992.0 Dewey 07-US military, traffic for Corn Snow, at 0105. Andrews-US Air Force HF-GCS control, Andrews AFB, MD, with a distinctively repetitive 121-character EAM, at 1418. (Haverlah-TX) Deuce 28-US Air Force tanker, traffic with Offutt AFB, NE, at 0328. (Lovell-Canada)

9040.0 Cuban Spanish AM female "numbers" (V02a), in progress at 1005. (Perron-MD)

9106.0 KNY70-SHARES, Herndon, VA, ALE sounding at 1345. (Cleary-SC)

9121.0 294-US Defense Logistics Agency, OH, calling 299 (Defense Logistics Agency, New Cumberland, PA), at 1418. (Perron-MD)

9143.5 ANG-Unknown VA National Guard asset, ALE sounding at 2320. (Perron-MD)

9025.0 OFF-US Air Force, Offutt AFB, NE, calling aircraft 538022, ALE at 1900. (Hugh Stegman-CA)

9414.5 KFD905-US Department of Agriculture Headquarters, Washington D.C., NPHRN voice check in with FEMA WGY9030, then ALE as USDAHQ1, at 1641. (Metcalfe-KY) WGY9441-FEMA auxiliary station, ALE sounding at 2019. (Cleary-SC)

9450.0 Unid-Unknown "numbers" station (E25), testing with multiple tones in AM, then playing its typical Middle Eastern music, no messages, at 0710. E25, testing with Middle Eastern music only, huge AM signal on and off after 1920. (Mike L-UK)

9576.0 Unid-Unknown "numbers" station with callup "232 Oblique 00" and no message (E11), at 0845. E11, callup 284/00 only, at 0915. (Mike L-UK)

10125.0 Unid-Unknown "numbers" station, callup 186/00 (E11), slower than usual, at 1230. (Mike L-UK) Cuban CW "cut numbers" (M08a), 5-letter groups in progress at 1833. (Castillo-Panama)

10202.0 119CDCS05-US Centers for Disease Control, ALE sounding at 0255. (Perron-MD)

10780.0 Cape Radio-US Air Force, radio check with NASA Booster Recovery Vessel Freedom Star on shuttle launch countdown, at 1504. (Cleary-SC)

10821.0 T1126-Possible US Army, ALE sounding at 1642. (Perron-MD)

10993.6 Coast Guard 6008-USCG helicopter, over a target of interest with Sector Key West, FL, and Shark 23 (probable USCG Cutter Drummond), at 2030. (Cleary-SC)

11086.5 GYA-UK Royal Navy, FAX weather charts at 1235. (Boender-

Netherlands)

11108.0 WGY908-FEMA Region 8, Denver, CO, phone patch test with possible WGY955 (IL State EOC, Springfield), at 1444. (Metcalfe-KY)

11175.0 Curly Top-US military, probably "Nightwatch" airborne command net, setting up comm with Horn Rack in a patch via Offutt HF-GCS, at 0155. Skull 02-Probable US Air Force or Air National Guard, attempting HF-GCS patch to Magic Control, no joy, so did a commercial patch to Cigar, at 0436. (Lovell-Canada) Anti Trust-US Military, patch via McClellan HF-GCS to Offutt AFB, passing orderwire traffic for Deck Boat, at 0250 and 0300. Andrews-Andrews AFB HF-GCS control point, MD, with a distinctively repetitive 125-character EAM, at 1522. (Haverlah-TX) NASA 928-NASA WB-57F high altitude research aircraft, patch via Offutt HF-GCS to Houston regarding photo recon of the space shuttle re-entry, at 1651. (Allan Stern-FL)

11220.0 Fury 12-US Air Force B-2A, secure voice check with Offutt at 1442. (Cleary-SC)

11232.0 Punch 22-US Air Force E-8 JSTARS, patch via Trenton Military to Peachtree (Robins AFB, GA), at 2153. (Cleary-SC)

11545.0 Lincolnshire Poacher (E03), identifier "44136," parallel 13375, at 1600. (Boender-Netherlands)

11551.5 103-Unknown agency, calling 100 in ALE, at 2110. (Perron-MD)

11565.0 EZI2-Israeli intelligence (E10), AM callup only, parallel 13533, at 0403. (Boender-Netherlands)

12068.5 291-US Defense Logistics Agency, Richmond, VA, calling DLAGLOBALNET (presumably DLA Global Net) in ALE, also on 6908.5, 8056, and 9121, at 1311. (Perron-MD)

12164.0 WNG981-Unknown US State Department, ALE sounding at 1328. (Perron-MD)

12528.5 6E78-Venezuelan Navy/ Coast Guard Riverine Forces, calling T5L1 (possible Navy headquarters), LSB ALE at 0300. (Perron-MD)

13200.0 Offutt-US Air Force HF-GCS, Offutt AFB, NE, with three EAMs, middle one with 125 characters, at 1600. Andrews HF-GCS, three shorter EAMs at 1630. (Haverlah-TX)

13488.0 WGY9441-FEMA, calling WGY9030, also sounding on 10202 and 20659, at 1840. (Perron-MD)

13855.0 OXT-Copenhagen Meteorological, Denmark, identified in CW then sent ice chart FAX, at 1220. (Boender-Netherlands)

13882.5 DDK6-German Weather Service, FAX chart at 1159. (Boender-Netherlands)

13927.0 AFA2XD-US Air Force MARS, FL, patching Evac 39 to base ops for arrival ambulance request, at 1424. AFA2MH, GA, patch with Keys 81, a MS Air National Guard tanker, also at 1424. AFA1QW, IN, morale patch for Pitt 13, a US Air Force C-130H, at 1445. (Stern-FL) Teal 14-US Air Force Reserve 53rd Weather Recon, WC-130J "Hurricane Hunter," patch via US Air Force MARS AFA1WP, at 1957. (Cleary-SC)

14015.0 PUN-Pirate radio beacon, Pista Las Peñas, Ecuador, CW at 2357. (Castillo-Panama)

14487.0 Lincolnshire Poacher (E03), weak at 1203. (Boender-Netherlands)

14776.0 WGY908-FEMA, CO, testing voice, ALE and RTTY with WGY911 (FEMA, Maynard, MA), at 1436. (Metcalfe-KY)

15016.0 Unid-Station said call too fast to copy, probably US military, with a long 174-character EAM, at 0120. (Haverlah-TX)

17026.0 KFS-Special historic maritime station, CA, test wheel in CW at 2218. (Stegman-CA)

17478.0 Cuban AM "numbers," (V02a), callup 81268 37874 24053, at 1603. (Castillo-Panama)

17480.0 Cuban AM "numbers," (V02a), new voice, in progress at 1604. V02a, old voice in AM, two days later at 1613. (Castillo-Panama)

18261.0 GYA-UK Royal Navy, FAX service for Persian Gulf forces, at 1723. (Boender-Netherlands)

20659.0 WNG920-NY State Department of Health, Albany, voice with FEMA WGY9030, then ALE as 001CDCS36, at 1844. (Metcalfe-KY)

24740.0 294-Defense Logistics Agency, OH, calling 309 (DLA, Battle Creek, MI), ALE at 1426. (Perron-MD)

27910.0 WBAP-Auxiliary cueing feed from commercial broadcast station, TX, simulcasting non-delayed program audio in narrowband FM, and showing possible tone-protection hum, at 0255. (William Hassig-IL) [Probable sporadic-e skip; nice catch. -Hugh]

DIGITAL DIGEST
DIGITAL MODES ON HF

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Digital Utility Myths

Spurred on by a recent UDXF posting, this month we take a look at one of the continuing myths of digital utility listening: the abundance of weather, press and other RTTY based services.

❖ XSS Mystery ALE Network Identified

Before we do, the mysterious "XSS" ALE network, so named after the callsign used by the main net control station, seems to have been finally identified. Back in the August 2006 issue of *MT*, we speculated that XSS was located in the UK and that this was probably a UK operated network. The purpose, callsigns and frequencies used by the network were well covered in last month's *Utility World* column, so we'll concentrate more on how the trail led to the origin of this station being uncovered.

XSS first appeared a couple of years ago with a few three letter Xxx outstations on a few frequencies, but it very quickly expanded to a large network with many channels. Propagation almost certainly pointed towards a European-based network, and we had first speculated that the network was a test system built by NATO's NC3A Communications Research group. This theory was coming from a number of presentations at the HF Industry Association website (HFIA, see Resources) that detailed timelines approximately fitting with the appearance of the network.

In late 2006, we had some further private information that pointed towards a UK MOD (Ministry of Defence) project, but with little other indication of the precise user. Last month, some enterprising listeners on the Utility DXers Forum (UDXF) finally got around to the only real way of figuring out the originators of the signals: plugging all the network frequencies into the PC-ALE program; scanning day and night and analyzing the signal strength, time, and propagation; and using directional antennas to roughly identify the source of the signal.

We don't know if anyone went to the final step of getting in a car and traveling to known transmitter sites to finally nail the signal, but with the frenzy of interest came more information from the HFIA website that indicated that XSS was most probably the new Defence HF Communications System (DHFCS) network. The HFIA document from contractor Rockwell Collins shows a net control station (NCS), an alternative NCS, transmitter sites in the UK (two sites: Forest Moor and one other), Gibraltar, Cyprus, Ascension Island and Falkland Islands.

As Hugh mentioned last month, final confirmation came in the form of a giveaway ALE link check between XSS and "UKE306," the ALE identifier of a NATO Boeing E3D AWACS aircraft based at RAF Waddington on England's East Coast. Further ALE AMD (similar to mobile phone text messages) have also been seen mentioning TASCOMM and other agencies supported by this network.

Traffic is infrequent on the network and consists mainly of ALE soundings and occasional bursts of MIL-188-110A high speed modems that send on-line encrypted traffic – not even a lead-in or lead-out signature is present.

❖ Where did all the RTTY go?

As we've documented steadily in the column over the last decade, simple Baudot RTTY transmissions of weather, press and aeronautical traffic are all but gone now. The problem is that a plethora of old frequency lists, handbooks and websites still detail all of this stuff, confusing especially new listeners with the promise of news from China, Tripoli and other far flung places. Barely a week goes by on the HF listener lists without someone asking where they can find these transmissions or why they haven't heard anything after a week of monitoring, or (perhaps worse), without them suspecting that their gear is broken.

Unfortunately, the truth is that most RTTY is gone.

There are a few exceptions you can try for:

- Hamburg (Pinneberg) Meteo continues to provide weather and sea conditions for Europe using good old fashioned 50bd/425Hz shift Baudot RTTY on 4583, 7646, 10100.8, 14467.3 and 15988 kHz.
- Rome, using callsign IMB32, also transmits occasionally on 5887.5 kHz using 50bd/850 Hz shift RTTY.
- Bucharest, using callsign YRR4 on 5731 kHz using 50bd/400 Hz shift Baudot RTTY.

To our knowledge, there is longer any HF press service nor aeronautical stations on the air.

In a recent post to the UDXF group, listener Bob Hall lamented the loss of these stations and modes, and at the same time told us that ALE simply wasn't exciting to him. It's a pity, since as we've shown over the years in this column, many of the organizations migrating to newer, faster and often ALE-enabled equipment still retain their old frequencies, identifiers and habits. They are still there, and in many cases, we only know that because of our ability to decode signals like ALE.

Hopefully, too, the resourcefulness displayed by the UDXF group in gradually putting the pieces of the puzzle of the XSS network together shows how exciting using ALE can be.

❖ Some old modes do come to life!

Finally, two old modes were recently spotted.

A British Army or Navy two channel Piccolo-6 VFT was heard on 18421.81 and 18422.21 this month. Our suspicion has long been that these systems are probably now only used by reserve units on exercise or for cadet training and are very rarely heard. Piccolo-6 can be decoded by a number of programs. The trick with this system is to tune to the center of the usually idling "engineer's channel" which lives on the lower of the two channels on the +510Hz offset. This occasionally sparks into life with operator chatter and often provides a legitimate British, usually M-series or G-three letter callsign.

We were also surprised to see listener Kristian K. see another blast from the past – a German Air Force three-channel FEC-A VFT. These machines use three channels of 192bd/170 FEC-A spaced at 690 Hz running in time delay mode.

Kristian heard them being used on 6830.5 kHz, using callsigns DHJ43 and 1Z5X with a combination of encrypted and plain text traffic. FEC-A also appears on the menu of many decoding programs and can be easily decoded. Until a year or so ago, FEC-A from the French diplomatic stations was a daily occurrence but have since left the air.

RESOURCES

HF Industry Association:
www.hfindustry.com

G LOBAL FORUM
THE WORLD OF SHORTWAVE BROADCASTING

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Italy Quitting Shortwave? Austria Stays; Finland Could Come Back

Reports have been circulating for months, but the time seems to be near for Rai to abolish its shortwave service, especially Eastern European languages, which are seen as a relic of the cold war, and put those megaEuro instead into international TV news and sports channels, says Andrea Borgnino, IW0HK (who works for Rai), in the *shortwave* yahoogroup. Pedro Sedano, Spain, of AER in *Noticias DX* says an Italian friend, apparently Borgnino, told him that Rai would close down its SW service before the end of July; RaiWay, the transmission provider, recently had a contract renewed but it did not mention SW.

Some other SW services are holding on: In Austria, the budget for ORF's radio services in 2008 will be cut by 2.5 million Euro. An ORF spokesperson denied rumors about 1.5 megaEuro of these savings to be made by stopping SW transmissions of Ö1 International: "This is not a plan of the management at present," according to *Der Standard*, Austria, via Kai Ludwig.

Finland has been off SW but maybe not permanently: Juhani Niinisto in Ontario, formerly with YLE, tells *DX Listening Digest* that the Finnish government granted June 21 a broadcasting license for transmissions on SW and MW from Pori. The recipient is Digi Waves Oy (Ltd.), a subsidiary of Digita, Finland. Pori was built in the mid '80s by YLE. Since YLE discontinued its broadcasts from Pori, no one had been a license holder for any possible services from that station. YLE had no license requirement as its operations are governed by law. The granting of a license as such does not mean that some broadcasts would start immediately, or even later, or at all. It only makes it possible for the license holder (Digi Waves) to solicit for customers, and creates a legal basis for any broadcasts the license holder could be able to acquire.

ALBANIA Dear Radio Tirana Listeners, We are pleased to notify the first ever e-mail address of Radio Tirana English Section, as follows: radiotirana-english@hotmail.com You are kindly encouraged to make your comments, remarks and questions about Albania and everything Albanian via email. Thank you and all the best from sunny hot Tirana, (Drita Cico, ARTV-Head of Monitoring Center, RADIO TIRANA, *DX LISTENING DIGEST*)

ARGENTINA On 3385, 16 June at 2314, R. La Voz de las Madres, Buenos Aires, Spanish, tangos, local announcements, temp 5.2 degrees, ID // 530 kHz; signal was strong for a while, then fading, the cycle repeating; during fades heard what sounded like a beacon WB (Renato Uliana, Brasil, *@tividade DX*) No other reports of this. Not an harmonic; maybe mixing product with the beacon, or someone relaying the 530 station, which has been legalized after many years of piracy/unofficialdom (gh)

Radio Continental heard on 11131-LSB at 1337 with program previews, *Carusel Mundial.*

R. Nacional Buenos Aires heard again on 6285 at 0031. I think this is a link to the studios, rather than a spur, since whenever it is on, it is carrying a remote broadcast, political event or football; and as soon as the remote is over it goes off while regular frequencies [6060] stay on the air.

Radio Baluarte reactivated 6215 with religion but not as strong as before; heard after sunset (Alfredo Locatelli, Uruguay, *ElEskuch@* blog) 6214.4, R. Baluarte, Puerto Iguazú, 2132-2150, Portuguese, Brazilian religious songs, 45333 - best signal ever this early (Carlos Gonçalves, Portugal, *BC-DX*)

BELGIUM RTBF International, 9970, fair in French at *0300, then pop vocals in French; strength usually improving to good by 0330 (Jim Ronda, OK, *DXLD*) 9970 is one of those rare frequencies registered for only one station in the world at whatever time; different sources conflict on exact timespan, some as late as 2300. 9970 is also the only active SW frequency from Belgium itself (gh)

BOLIVIA New SW station! R. Universitaria on 4732 at 1110-1130 June 21 with pop music, but no location heard (Alfredo Locatelli, Uruguay, *condig* list) Also from 1050 with Argentine zamba music, no announcements (Arnaldo Slaen, Argentina, *ibid.*) At 2245-0015, several IDs, "97.9 MHz y ahora también onda corta 4730 kHz, Radio Universitaria, desde la ciudad de Cobija, Universidad Amazónica de Pando"; Gives address radiouap@hotmail.com and Radio y Televisión Universitaria, Campus Universitario, Av. Las Palmas, Cobija, Pando, Bolivia. More info at **http://www.uapnet.edu.bo** Announces SW schedule as 1000-1300, 2200-0200 the sign-off variable. Was relaying FM 97.9 but planned to have separate SW programming from July (Nicolás Eramo, Argentina, *DXLD*)

Audible but with heavy RTTY QRM before 0200 (Scott R. Barbour Jr., NH, *ibid.*) Free from QRM for 10 to 15 seconds at a time at 0058 (Maurits van Driessche, Belgium, *ibid.*) Good signal but heavy digital QRM here too until 0200* (Alfredo Locatelli, Uruguay, *ElEskuch@* blog) No QRM in the morning, sign-on one day at 1015, another day *0958, another *1045 (Robert Wilkner, FL, *Japan Premium, SW Bulletin*) On July 1 stayed on until 0300* with formal sign-off, university anthem, RTTY QRM (Rafael Rodríguez, Colombia,

*All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; sesqui = one and a half; B-07=fall/winter season; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated*

condig list) From numerous reports, frequency varies slightly up to 30 Hz (gh)

R. Chicha, Tocla, Potosí, heard at 1050 on 4763, *Impacto* program, ID as "Radio Chicha, en 100.5 MHz FM para Tocla y onda corta de 4760 kilociclos para el mundo"; closed at 1115 (Alfredo Locatelli, Uruguay, *ElEskuch@* blog)

BRAZIL Rádio Educadora, de Limeira (SP), is the only Brazilian still on 120m, heard by Márcio Pontes, SP at 0917, with a sertaneja music show on 2380 kHz (Célio Romais, *Panorama, @tividade DX*)

CHINA [non] Does anyone know, mind or care about CRI's Cuban relay on 9570 12-14 UT effectively blocking Radio Australia on three of its frequencies?! When the Cuban comes on 9570, white noise appears on RA's 9580. A spur approx. 19 kHz from 9570 makes a mess of RA's 9560 and 9590. Matters get worse when modulation starts (Andy Reid, Ontario, *DXLD*) Someone apparently got the word, since 9570 was missing or sporadic for a few days, then came back with slightly better modulation and less spurious output, but still a problem in the east where the signal is aimed. In CNAm RA was received OK (gh)

CHINA PBS Yunnan, V. of Traffic, 6937, putting out spurs on 6905 S3, 6913 S3, 6921 S4, 6929 S5, 6937 S8 ute QRM, 6945 S4 with Chinese radar QRM, rather ironic that they are jamming themselves! 6961 S3 and finally 6969, so heard every 8 kHz from 6905 to 6969, with the fundamental under QRM. Heard at 1355 (Dave Vitek, South Australia, *harmonics* yg)

CROATIA [and non] Voice of Croatia English service don't actually broadcast about Croatia or the country's history and culture, etc. English broadcasts concentrate on local and international news, sports and the weather, but do have some music programs in the Croatian service with very few announcements between records (Richard Read, World DX Club *Contact*)

CUBA RHC fair-poor on 9820 in Spanish at 2240-2400*. Arnie Coro explained by e-mail that RHC is now using it for the irregular *Mesa Redonda Informativa* show at 2200 or 2230 until 2400, 100 kW aimed at CNAm, so Colombia is off the back (Yimber Gaviria, Cali, Colombia, *Noticias DX* yg) RHC used 9820 for years, but left it sometime last year. I was expecting them to resume it (gh)

ECUADOR HCJB had not used their 500 kW transmitter at Pifo for quite some years. But this HC-500 rig is back on air according to schedule, 2250-0230 to Brasil on 11920, running 250 kW. HCJB German service says no more broadcasts direct to Europe from Sept or Oct, and DRM tests will have to cease, but will continue with small antennas to South America until 2009, such as 3220 and 6080 kHz (Kai Ludwig, Germany, *DXLD*) Presumably were using one of those small 10 kW transmitters for the 4 kW DRM tests, but with high-gain antenna which must be dismantled for airport construction (gh)

EGYPT An espionage station plays music of the great singer Om Kalthoom, on 9450 heard at 0700-0800. Tarek Zeidan also reports it in the 7100-7200 range (Wolfgang Büschel, Germany, *DXLD*) This is station E25 to ENIGMA, also discovered hiding under Rai on 6140. Tarek says you can hear much more of her music via **http://sawari.com/ index_files/om-kalthoom.htm** (gh)

ETHIOPIA [non] Another new clandestine started July 2, brokered by TDP, Zena Tewahedo the Ligament Holy Synod of the Ethiopian Orthodox Tewahedo Church in Exile, 1600-1700 on 15260 Mondays only in Amharic (Bernd Trutenau, Lithuania, *DXLD*) Via Samara, Russia,

250 kW, 188 degrees (HFCC) Audio files at **http://www.eotcholy-synod.org/** (Dave Kernick, England, *DXLD*) On the second Monday, I heard this sign on at 1559 and off at 1700. First half sounded like a sermon; the second half a male voice with background music. Several frequency announcements were made, and at 1655 a postal address in California announced (Patrick Robic, Austria, *WORLD OF RADIO*)

Heard that on Monday, R. Freedom on Tuesday, Andenet Ledemocracy on Sunday (Kouji Hashimoto, Japan, *Japan Premium*) On Thursday during same hour heard EPPF Radio (Ernesto Paulero, Argentina, *DXLD*) Now every day of the week is accounted for on the 15260, 1600-1700 UT transmission, per TDP SW Airtime sked **www.airtime.be/schedule.html** Mon: Zena Tewahedo the Ligament Holy Synod of the Ethiopian Orthodox Tewahedo Church in Exile; Tue & Sat: Radio Xoriyo Ogadenia; Wed, Fri & Sun: Andenet Ledemocracy; Thu: EPPF Radio (gh)

GREECE 9935, RS Macedonias, Avlis, 9935, earlier reported with news in English M-F at 1156-1200, on at least two days in June instead at 1145-1200 relayed Deutsche Welle in Greek (Rumen Pankov, Bulgaria, *Australian DX News*)

HUNGARY As forecast last month, R. Budapest did terminate all foreign-language broadcasts at the end of June, but continued in Hungarian (gh) The following announcement was broadcast: "Now I would like to call your attention to the fact that as from June 30th 2007, Radio Budapest will cease to broadcast in English. Instead, Hungarian language broadcasts will be aired on our frequencies. This is part of changing the program structure of Hungarian public radio in order to have a more cost-effective operation. Thank you for having listened to us." (*Media Network* blog)

Disappointed with final broadcast. Hoped for more about R. Budapest, their broadcasting history, etc., in other words a "proper" goodbye. I guess I need closure. I will miss R. Budapest. Interesting programming not heard elsewhere. Was an RB SW Club member for many years (Kraig Krist, VA, *DXLD*) Another sad closure; I've been listening to Radio Budapest nearly 45 years. When I roam the bands and notice such cornerstone stations missing, it's the same feeling as when I revisit the neighborhoods in which I grew up and all the familiar places are gone (Al Quaglieri, NY, *NASWA Listeners Notebook*)

R. Budapest continues to produce a 58-minute program in Hungarian, *Szülöföldünk* ("Our Birthland"/"Our Homeland") repeated over and over, at 18-23 to Europe; and to NAm at 00-01 on 6195, 0130-0230 on 6140. Also plays Hungarian music, and relays domestic Kossuth Radio for many hours (Dragan Lekic, Serbia, *DXLD*)

Looks very much like merely killing airtime, since the amount of transmitter hours appears to be about the same as before. I can hardly imagine that this is intended by MR but strongly suspect that they just cannot get rid of all the airtime agreed with Antenna Hungária (the transmitter operator) at present. So all they saved so far by axing the foreign language broadcasts are the royalties/salaries of the now fired editors. Congrats! (Kai Ludwig, *ibid.*)

We are aware of the fact that our decision is painful to many people. It was not easy to come to this conclusion, as Radio Budapest broadcast news about Hungary and served many of you through many years. Thank you for your continuous and honorable attention. We hope that our programs were worthy of your interest. In hoping for your kind understanding! Yours sincerely, György Such, President of the Hungarian Radio (via Kraig Krist, *WORLD OF RADIO*)

ICELAND In the June 28 evening news, Ríkisútvarpið reported the end of shortwave broadcasts to be July 1 (Reynir H. Stefánsson, Iceland, *DXLD*) And no longer heard as of July 1 (Harry Brooks, NE England, *ibid.*) So cross off their schedules on 13865 and 12115-USB (gh) Modulation was awful (Walt Salmaniw, Poland, *DXLD*) These were never intended for the public, but ships at sea (Trutenau, *ibid.*)

INDONESIA VOI heard on 9525 in Korean instead of Indonesian at 1300-1400; Korean had been at 1200 (gh) VOI expanded Thai and Japanese programs from 30 minutes to an hour, some days on 9525, others on 11785, bumping other languages later: 1000 Thai, 1100 Chinese, 1200 Japanese, 1300 Korean, 1400-1500 Indonesian (A. Ishida via S. Hasegawa, *NDXC*)

Atsunori Ishida updates an Indonesian monitoring list every few weeks: **http://wave.ap.teacup.com/applet/n1hp/msgcate2/archive** He was hearing RRI Biak again on 4920 at *2000 and until 1500* (via S. Hasegawa, *NDXC*)

ISRAEL In early July, more Israel Radio cutbacks were rumored, as of August 1, severely curtailing foreign languages, including the only external English broadcast at 1900. Also, they say that shortwave is due to end on the 1st of January 2008. Employee reductions were mentioned. Always subject to negotiation (Doni Rosenzweig, *DXLD*)

Judging from several monitoring reports by José Miguel Romero, Wolfgang Büschel and Terry Krueger, one can never be sure whether Galei Zahal, the IDF station, is on one or both of its frequencies, or neither, and if on may vary up to 10 kHz away from 6973 and 15785 (gh)

KOREA NORTH The VOK transmitter for Europe on nominal 15245 varies and puts out variable spurs around 15185.26 and 15304.89 between 1300 and 1950, including English at 1300, 1500 and 1800 (Wolfgang Büschel, Germany, *DXLD*)

[non] The new Japanese-government-sponsored abductee service for North Korea mentioned last month is *Radio Furusato no Kaze* = Wind of Hometown, launched July 9, per Kyodo News (S. Hasegawa, *NDXC*) 30 minutes each in Korean and Japanese, repeated daily for a week

before being updated. The Cabinet Office said it was not releasing time or frequency in order to avoid jamming by North Korea (AP via Mike Cooper, *DXLD*) 1600-1630 Japanese 9780, 1700-1730 Korean 9820 (*WORLD OF RADIO*) Both collide with other stations, but no jamming heard (Jari Savolainen, Finland, *DXLD*)

Radio Australia program was mistransmitted at end of *Furusato no Kaze* on July 11 for a short time; site may be Tainan, Taiwan (S. Hasegawa, *NDXC*) Whence RA is also relayed. If you're trying to operate in deep secrecy, better not make mistakes like that (gh) Tainan, Taiwan, 9780 with 250 kW at 45 degrees, 9820 with 100 kW at 2 degrees (Ivo Ivanov, R. Bulgaria, *DXLD*) 9780 fair to good here, no jamming or QRM at all (Ron Howard, CA, *ibid.*) Address: Furusato no Kaze, Headquarters for the Abduction Issue, 1-6-1, Nagata-cho, chiyoda-ku, Tokyo 100-8968, Japan Email: info@rachi.go.jp (S. Hasegawa, *NDXC*) In Korean, name of station is *Ilpone Palam* (Wind of Japan), different from Japanese (Takahito Akabayashi, Japan, *BC-DX*)

KWHR calls it "Korean Cultural Programming," M-F at 1100-1158 on 9930, but it's really the clandestine, Open Radio for North Korea, as mentioned last month. No jamming audible here, and heard at 1127-1135 alternating English and Korean with complete two-year-old news items in each language. Well, they are a bit behind in North Korea, but why in English first? Closes with a *Pomp & Circumstance* march (gh)

KURDISTAN [non] Dênge Mezopotamya extended schedule to 0400-2000 on 11530 (TDP via Bernd Trutenau, Lithuania, *DXLD*) In Kurdish via Kishinev, Moldova, 300 kW, 116 degrees daily (*DX Mix News*, Bulgaria)

KUWAIT R. Kuwait in English on 11990, heard June 28 at 1945 with pop music, 2000 ID, reactivated? (Tony Rogers, UK, *BDXC-UK*) Also with news at 1830 (Steve Lare, MI, *DXLD*) At 1800-2100 as previously. Morning transmission in English to S Asia on 15110 has also resumed at 0500-0800 (Noel R. Green, England, *DXLD*) English had been off SW for 3 or 4 years. It's great to hear something back on SW especially with the closure of Radio Budapest and Iceland's SW relays (Dave Kenny, England, *BDXC-UK*)

unID in Arabic on 9885 between 2120 and 2303 (José Miguel Romero, Spain, *DXLD*) Maybe Kuwait, error, supposed to be on 9855 at 1810-2400 per Aoki (gh) Yes, seems to be Kuwait (Tomás Méndez, Spain, *playdx yg*) Next day on 9855, not 9885 (Romero, *DXLD*)

LAOS [non] KWHR Hawaii schedule shows more Hmong shows at 1200-1300 on 12130: Tue & Thu, *Hmong World Christian Radio*; Fri *Radio Hmong Radio* [sic], separate from *Hmong Lao Radio* on WHRI (gh)

Vang Pao, Hmong leader in exile, and nine others were arrested in California in early June, for a plot to smuggle arms from Thailand into Laos and overthrow the Laotian government (*Minneapolis Star-Tribune*) This was a hot topic on *Hmong Lao Radio* for weeks to come, with which Vang Pao may have connections, judging from English names and words mixed in with the Hmong, Sat & Sun 1300-1400 on 11785 via WHRI (gh)

LIBERIA Radio Veritas, 5470 in mid July at 2049-2104*, animated political discussion in English, terse ID at 2104 before pulling the plug, not until 2300* as in *WRTH* (Chris Lobdell, MA, *NASWA Flashsheet*)

[non] Heard announcement on Star Radio that it would be temporarily closed from June 15 to relocate offices and studios from the Old CID Road in Mamba Point to 12 Broad Street, opposite Ruby Bar and Restaurant, Snapper Hill in Monrovia. Listeners were assured that it would resume broadcasting in the shortest time possible. 9525, 0700-0800 via Ascension (Stig Hartvig Nielsen, Denmark, *DXLD*) Same info on the website, not being updated because of the move (*Media Network* blog) Had been sharing the hour with Cotton Tree News, for Sierra Leone in second half, but then CTN heard during the first half too (Bjarke Vestesen, Denmark, *DSWCI DX Window*)

LIBYA [non?] Tuned in new 15550 at 1205 July 4 to hear news in English just ending with ID for V. of Africa from the Great Jamahiriyah, 1206 into French, 1212 music. Audio was good; fair signal with deep fades. Hard to decide if this were direct or via France. English news must have started close to 1200; later interference from Russia already using 15550 (gh, OK)

LITHUANIA The Mighty KBC, based in Netherlands, announced new weekly programs on 6255: Fri & Sat 2200-2259 at 259 degrees, UT Sun 0100-0159 at 310 degrees; expects to become daily in 2008. **www.kbcradio.eu** (Ydun Ritz, Denmark, *DXLD*) The 310 degree broadcast must be for NAm (gh)

MADAGASCAR World Christian Broadcasting is building a SW station here, Madagascar World Voice, to counterbalance its KNLS in Alaska. The *Dallas Morning News* (via Mike Terry) reported that Rep. Pete Sessions, R-Dallas, wants U.S. taxpayers to spend $2.5 million on it, prompted by U.S. Ambassador to Madagascar, James McGee, the excuse being that it is helping fight HIV/AIDS in Africa – even though it's not on the air yet. Another blatant violation of church and state if it were to happen, and WCBC is not even a constituent of Sessions, but based in Tennessee (gh)

MÉXICO After missing a few weeks, Radio UNAM was barely audible again from July 8 on 9599.2 variable, better at 0135 than at 1310. Blocked by Cuba at times such as before 1300 (gh, OK) It's weak even here in the DF, // 860 with classical and cultural programming (Julián Santiago Díez de Bonilla, *WORLD OF RADIO*)

NETHERLANDS Former RNW commentator Rob Greene has launched his own blog, **http://insite2out.wordpress.com**

RNW itself also has a new blog connected with a series of global debates entitled "Who Can We Trust?" organized by former RNW PD Jonathan Marks, **http://blogs.rnw.nl/rnw60debates/** (Andy Sen-

nitt, *Media Network* blog)

PAPUA NEW GUINEA Three stations audible around PNG sunset 0735-0840, all presumed, with Pidgin talk, occasional music: 3260 R. Madang, 3315 R. Manus, 3335 R. East Sepik. Best multi-station PNG logging at this QTH this summer (Stephen Bass, OH, *DXLD*)

PERÚ 4954, R. Cultural Amauta, 2210, Asian style music with announcers in presumed Japanese; signal was strong but suffered from modulation problems, mentions of Jesucristo (Steve Wood vacationing in Lima, Perú, *CIDX Messenger*)

4940, R. San Antonio, Villa Atalaya, 0120 with mass, 0133 ID mentioning 95.5 FM and 4940, cut off without closing at 0201.

5120.4, R. Ondas del Suroriente, Quillabamba, 0035-0106, *Sábados Calientes* program, 0101 ID giving 1400, 96.5 and 5070 kHz (Rafael Rodríguez R., Colombia, *condig* list)

Shifted to 5120 probably to avoid WWCR! On 4940, don't confuse with the sporadic Venezuelan, *q.v.* (gh)

POLAND [and non] R. Racja, for Belarus, added a broadcast via Lithuania, 100 kW, 1530-1730 on 6225; also still transmitted via Warsaw at 1930-2130 on 6105 (Bernd Trutenau, Lithuania, *WORLD OF RADIO*) 6105 broadcast is now the only transmission from Poland on SW; transmitter already on with characteristic rumbling sound at 1925, 1930 R. Racja ID, stronger at 2100 recheck (Mike Barraclough, England, *WDXC Contact*) Polish Radio now only transmitted from Germany (gh)

ROMANIA RRI transmissions are disrupted due to reconstruction of SW facilities. According to the DX-editor of RRI in Russian: 1) All antennas will be repaired by at least May 2008. 2) All transmitters will be replaced with six new ones: 3 x 300 kW in Tiganesti, 2 x 300 kW in Galbeni and 1 x 100 kW in Saftica. 3) Until Sept 15 there will be problems in Galbeni with Romanian, English and French broadcasts. 4) From Sept 15 till Oct 30, Tiganesti work causes Russian and Chinese to be only on Internet. 5) Saftica work should be finished by May 2008 or earlier. For season B-07 all broadcasts will be on the air as usual (Rumen Pankov, Bulgaria, *BC-DX*)

SRI LANKA SLBC presenter Roshan Abhiseka mentioned that the refurbished 9770 transmitter used for English programming is now running at 200 kW and that evening transmissions in English are to resume from B07 (David Woollan, Nepal, *DXLD*) 9770 sked: 0100-0430 (Sun -0515) (*WRTH*)

SUDAN [non] Southern Sudan Interactive Radio Instruction, all in English:

0600-0630 M-F, 15440 Dhabbaya, UAE, 250 kW, 240 degrees
0600-0630 M-F, 15505 Armavir, Russia, 500 kW, 188 degrees
0630-0700 M-F, 11945 Kigali, Rwanda, 250 kW, 15 degrees
0630-0700 M/W/F, 15445 Dhabbaya, UAE, 250 kW, 240°
1400-1430 Tue/Thu/Sat, 15470 Armavir, Russia, 200 kW, 188°
(*DX Mix News*, Bulgaria)

Although Sudan Radio Service still has no SW frequency sked on its website, **www.sudanradio.org/index.php** the Time Table page in UT +3 indicates there are more English broadcasts than shown in the *WRTH* A-07 update. Besides M-F 0300-0330 UT on 5985 via Kigali, and Sat/Sun 1500-1530 9840 via Moscow: namely, 0530-0600 M-F on 15325 via UAE; 1730-1800 M-F 9590 via UAE (gh)

TAIWAN New RTI address starting July 1: P O Box 123-199, Taipei, Taiwan, as announced on air and website (Ian Baxter, Australia, Alokesh Gupta, India, *DXLD*)

TIBET On 7385, China-Tibet Broadcasting Station *Holy Tibet* English program heard at shifted time 1635-1705 (Christer Brunström, Sweden, *SW Bulletin*) I met the producers of this program at the broadcasting complex in Lhasa and was the first foreign listener to visit them. *Holy Tibet* started in May 2001 and is now a full half-hour. New programs are produced on M/W/F with repeats on the following days. On Sundays there is only music. *HT* is aimed at tourists visiting Tibet as well as at the descendants of the many Tibetan refugees living in India (Maarten Van Delft, *DSWCI DX Window*) Also at 0700, both on several frequencies in the Tibetan-language service (gh)

UKRAINE Despite 100% increase of total RUI English hours in April, number of original program airings remained the same. In order to fill the air, number of repetitions has been doubled. My monthly DX program *The Whole World on the Radio Dial* is repeated 31 times! New *WWORD* edition does not abruptly replace the previous one. There is a curious alternation pattern: New show airs Sat 1918, Sun 0018, 0518, 1118, and previous show Sat 2118, Sun 0318, 0718, 1418 (Alexander Yegorov, RUI, *Signal*)

U S A From microphone to keyboard: On 6 July, *Talk to America* ended its 12-1/2 year run as VOA's live English-language radio talk show. From 11 July, it becomes an online live text chat, *T2A*, accessible via **www.voanews.com** once a week, Wednesdays at 1800 (*kimandrewelliott.com*) This is progress? What fills the 14-15 hour? (gh) Standard *News Now* fare, with *Reporters' Notebook* Friday at 1430-1500. I offered to revive *Communications World*, and it looked like it would happen, at that time, with repeats during the weekend, but ultimately that was not approved (Kim Andrew Elliott, *WORLD OF RADIO*)

Rumor of demise of the Delano site was premature. It'll stay on the air the next few years. VOA Greenville is not going to be on much longer than that, either (Charles A Taylor, WD4INP, Greenville, NC,

IRCA)

The House of Representatives approved an amendment by Congressman Connie Mack (R-FL-14) June 21 that will provide an accurate and comprehensive alternative source of news to the people of Venezuela. The amendment to the FY 2008 Foreign Operations Appropriations Bill, which passed by a voice vote, would grant the Broadcasting Board of Governors the tools to increase broadcasting to Venezuela and Latin America. On the House floor, Mack, a member of the House Foreign Affairs Committee, said "Freedom of the Press died in Venezuela on May 27, 2007, when Chávez shut down Radio Caracas Televisión (RCTV). . . We cannot turn our backs on the people of Venezuela. We must do more to promote freedom inside Venezuela." (Mack's website) VOA Spanish to LAm amounts to two sesquihours a day, and part of it in the morning is for the Andes, which includes Venezuela (gh)

This constitutes an escalation in the media campaign that Bush has unleashed against the Venezuelan revolution. Truth is winning and will keep winning this battle. Imperial lies against Venezuela will be defeated (Venezuelan Information Minister Willian Lara, via Bloomberg, via *kimandrewelliott.com*)

New exile program started abruptly in July on WRMI, La Voz de la Demajagua, Sun 2230-2300 on 9955, from the Association of Cuban Cattlemen (*Ganaderos*) in Exile (Jeff White, WRMI) *Demajagua* is an historic farm in Granma, now also the name of the Communist Party newspaper there. This displaced *Mundo Radial* and *World Cricket Today* to UT Monday 0500-0530 (gh)

The schedules for KJES in most references, including ours (*MT*'s) through August, missed the fact that KJES shifts all broadcasts one UT hour earlier during DST, including English at 1300-1500 on 11715, 1800-1900 on 15385, 0100-0230 on 7555. Even the FCC has it wrong, so it could be that KJES is making the shifts without authorization, going by the local clock instead of UT (gh)

A Colleton County jury found that minister Ralph G. Stair and his Overcomer Ministries misled 11 former members concerning how their donations were to be used. If a planned appeal fails, the verdict will cost Stair $731,679.64. The jury unanimously awarded the plaintiffs $274,163 in actual damages and charged Stair another $457,516.64 in punitive damages. "Every single one of them is a liar," said Stair when asked about the verdict. "It's all in the Lord's hands." Stair and his lawyer Mathias Chaplin plan to appeal the decision. The former members allege that they donated their money because they were told that it would only be used to fund Stair's internationally popular [sic] evangelical short-wave radio program. After leaving the church, the former members say, they realized that the money had been directed to other purposes, and filed suit in 2002 (Jared Goyette, *The Press and Standard*, South Carolina, April 27, 2007 via **www.rickross.com/reference/rgstair/rgstair22.html** via Mike Barraclough, *DXLD*)

[non] Brother Stair is being relayed by European pirate Laser Hot Hits on 6275. The Overcomer Ministry was heard on July 3 at 0905 on 6275 with a weak signal here although it was getting out better in mainland Europe. Stair has been announcing his new service on air. It is not daily (yet). Also heard Sunday July 1 on 6245 at 0920 – possibly being relayed by another pirate, Jolly Roger Radio in Ireland, which also carries Laser Hot Hits relays on Sunday mornings. It looks like Stair is now trying to convert free radio fans in Europe (Paul Watson, England, *DXLD*)

VANUATU Radio Vanuatu (assumed), reactivated in mid-July on 3945, no ID at 1000 but into obvious Sunday church Vanuatu style program. Always great a cappella music here. Pretty clear, fairly steady signal, moderate strength (David Norcross, Hawaii, *DXLD*) Watch out for Japan on 3945 until 0730 weekdays, 0930 Sat, 0900 Sun (gh)

VENEZUELA Formerly jumping around above 5.1 MHz with a distorted signal, in late June, R. Amazonas, Puerto Ayacucho, the only active SWBC station in the country, was widely reported near its nominal 4940 (gh) 4939.6, ex 5125v at 2228 but closing very early at 2330* (Rafael Rodríguez R., Colombia, *condig* list) Another day on 4939.82, presumed R. Amazonas, 0019-0037 but IDs too soft to make out (Scott R. Barbour, Jr., NH, *DXLD*)

[non] R. Nacional de Venezuela replied to my report in 13 months, via FedEx direct from Caracas costing $40 US, with a lot of literature in Spanish like *Empresas de Producción Social, La Pobreza de Venezuela,* and *Obras del Gobierno Bolivariano* (Dan Malloy, Canada, *ODXA*)

ZANZIBAR On one occasion in mid-June Voice of Tanzania Zanzibar heard on 11735 with news in English from Spice FM at 2000 instead of 1800 (Christer Brunström, Sweden via Thomas Nilsson, *DXLD*)

ZIMBABWE Mugabe's Voice of Zimbabwe was still running nothing but music tests in mid-July. Some possible reasons: ZBH's Spot FM Editor-in-Chief Methuseli Moyo faced dismissal for resisting deployment to the new state-run radio station, VOZ. Sources said Moyo rejected an appointment at the controversial station arguing that he was a professional journalist and not a propagandist.

A later story said that radio jamming equipment from China was gagging the VOZ project, due to "self-signal interception," whatever that means (*Zim Independent* via David Pringle-Wood, *DXLD*)

Until the Next, Best of DX and 73 de Glenn!

BROADCAST LOGS

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http://mt-shortwave.blogspot.com

0036 UTC on 4716.62
BOLIVIA: Radio Yura. Announcer's Spanish text to station identi-fication at 0143. Fair signal amid static crashes. (Scott Barbour, Intervale, NH) Additional Bolivian stations in Spanish: Radio Mosoj Chaski 3310 ,0052-0111 (Barbour) Radio Santa Cruz 6134.8, 0935-1005 (Brian Alexander, PA; Chuck Bolland, Clewiston, FL) Radio Panamericana 6105.56, 1116-1120. (Arnaldo Slaen, Buenos Aires, Argentina)

0045 UTC on 4918.98
ECUADOR: Radio Quito. Spanish slogan "la voz de la Capital." Ads, jingles and announcer's talk. Spanish pop music with good signal strength but slight CODAR interference and adjacent chan-nel splatter. (Alexander) HCJB Global 11960, 1732-1742 English religious text to inspirational music and sermon. La Voz del Napo 3279, 1007 Spanish prayers. (Joe Wood, Greenback, TN)

0240 UTC on 15630
GREECE: Voice of Greece. Greek folk music program // 7475. (Stewart Mac Kenzie, Huntington Beach, CA) Spanish comedy interludes, sports and interviews. (Branco. NY)

0351 UTC on 4885
BRAZIL: Radio Clube do Para. Portuguese station promos in echo-effect. Station IDs and program items to up-tempo Braz music. (Wood) Additional Brazilians in Portuguese: Radio Record (tent) 6150, 0232-0238 (Barbour) Radio Nacional 3375, 0851-0904 (Harold Frodge, Midland, MI) Radio Aparacida 5035, 0910-0920; Radio Senado 5990, 0955-1010 (Alexander) Radio Cultura On-das Tropicais 4845.27, 1014-1025. Radio Central Brasileira De Anhanguera 4915, 1003-1020. (Bolland).

0503 UTC on 7240
SOUTH AFRICA: Channel Africa. Good signal for program on AIDS treatments for African children. (Wood) 17770 at 1515 with Africa Power Hour. (Branco)

0529 UTC on 5030.01
BURKINA FASO: Radio Burkina. Station sign-on with instrumental national anthem. Opening French ID and station info at 0530. Lo-cal tribal style music to French announcement breaks. Fair signal for Burkina in the clear tonight, with Costa Rica 5030 off the air. Slight splatter via Cuba on 5025. (Alexander).

0848 UTC on 5939.30
PERU: Radio Melodia. Signal under a Brazilian station on 5940. Spanish comments as signal faded periodically, and reappeared to poor level. Peruvians in Spanish: Radio Cuzco (tent) 6193.40, 0910-0915; Radio Ancash 4990.91, 1027-1038; (Bolland) Ra-dio Tawantinsuyo 6173.79, 1055-1100. (Slaen) Radio Victoria 6019.52, 0615-0635 (Alexander) Radio Sicuani 4826.37, 0952-1005. (Bolland).

0855 UTC on 5920
RUSSIA: Radio Rossii (tentative). Weak signal under WBOH. Time ticks to Russian news and comments. Overall poor copy possibly via Petropavlovsk-Kamchatskiy. (Bolland) Voice of Russia 15425, 0220-0225. Weak signal on // 5900; Vatican Radio via Russia 15560, 0207-0215. (Jim Evans, Germantown, TN) Additional Voice of Russia 9405, 1630; 7350, 1636; 9435, 0304; 13970, 1617; 6145, 1618; 12085, 1620; 12025, 1621; 11540, 1622; 9930, 1624. (Gerry Brookman, Kenai, AK)

0952 UTC on 4749.96
INDONESIA: RRI Makassar. Indonesian. Fair at best with sub-continental vocals and lady's announcement. Additional Indo's: RRI Manokwari 3987.04, 1150-1217; RRI via Cimanggis 9524.97, 1159-1222.; RRI Fak Fak 4789.94, 1304-1315. (John Wilkins, Wheat Ridge, CO) Voice of Indonesia 9525, 1025-1030; RRI Jakarta 9680, 1035-1110; RRI Wamena 4869.91, 1035-1045. (Bolland)

1003 UTC on 9615
PHILIPPINES: Radio Veritas Asia. Mandarin. Language comments to music presentation for fair signal. FEBC-Philippine relay 6193.31, 1025-1030.Faint signal for Mandarin service and religious music. (Bolland).

1104 UTC on 9930
CLANDESTINE: Open Radio for North Korea (ORNK) via KWHR. Korean text over classical music and ballads. Segments of US soul music by Otis Redding to 1158. Pomp and Circumstance to English ID. Fair-good signal quality with no jamming observed.

(Ron Howard, Monterrey, CA) Additional stations: Cotton Tree News 9525, 0735-0759; SW Africa 12035, 1708-1714. (Slaen) Shiokaze via Taiwan 9485, *1300-1330.* Chinese. Three-minute opening with piano background music. Reading roster of names, closing followed by usual Radio Free Chosun *1330. Good signal amid nasty splatter. (Wilkins) Radio Xoriyo Ogadencia 15260, 1617-1627 (Slaen).

1112 UTC on 6214.27
ARGENTINA: Radio Baluarte. Portuguese. Reactivated station from Puerto Iguazu. SINPO 34343 during religious programming. Thanks to Nicolas Eramo for tip! (Slaen). Radio Continental 11440, 2254-2307. (Frodge)

1139 UTC on 6049.64
MALAYSIA: Asyik FM. Regional pop music program to 1200 news bulletin and "Asyik FM" identification. Good signal. Malaysia's Klasik Nasional 5964.92, 1215-1222. (Wilkins) Malaysia's RTM 6049.62, 1010-1030; RTM 6049.59, 1020-1030; RTM 7295, 1028-1045. (Bolland)

1542 UTC on 9740
SINGAPORE: BBC World Service relay. News program and dis-cussion on U.S./Mexico border situation on aliens. SIO 444. Additional BBCWS monitored as; 9625, 0458; 13970, 2346; 15400, 2247; 1205, 2205; 6195, 1553; 5980, 1554; 5970, 1555.(Brookman)

1624 UTC on 9990
NORTH KOREA: Voice of Korea. Propaganda program on Japa-nese occupation of Korea to national music. Drama program on 13730 at 0235; 13970, 0412; 13760, 2246; 9990 at 1623. (Brookman) 9650, 1008-1015 Japanese. (Bolland)

1647 UTC on 11845
USA: Radio Marti. Spanish programming including IDs news on Cuba and segment on the music of Bob Dylan. Afternoon news roundup to Cuban salsa tunes. Station ID, frequency, meter band quote and move to 11930 kHz. (Gayle Van Horn, NC) Ad-ditional US stations: WRMI 9955, 1050-1100 Spanish program Aventura Diexista. SINPO 25432. (Slaen). WHRA 6145, 0535; WWRB 9385, 2155. (MacKenzie) AFN/AFRTS 12133 (Key West, FL) 2308-2330+. (Frodge) WINB 13570, 1747; WWCR 12160, 1744. (Wood)

1735 UTC on 11590
ISRAEL: Kol Israel. World news segments to ID. Focus on news from the Middle East to weather forecast and headline review. Trumpet blare to ID and end of English service. (Van Horn) 11590, *0330-0340 English //9345 fair. Israel's Galei Zahal (tent.) 6971.16, 0057-0102. Hebrew text; 15780.05, 2151-2234 with slight freq drift. (Frodge)

2130 UTC on 11600
CZECH REPUBLIC: Radio Prague. Newscast to feature on 62nd Anniversary of VE Day. SIO 554. (Bob Fraser, Belfast, ME) Clos-ing bits of Czech Book 11600, 2155-2157*; 9415, 2230-2243. (Wood)

2148 UTC on 15205
RWANDA: Deutsche Welle relay. Program on searching for an-tiques in local flea markets, with focus on crockery styles. ID at 2152. (MacKenzie) World news, Business Report and Newslink on 15205 //11865, 2110-2130. (Van Horn)

2245 UTC on 4732.03
BOLIVIA: Radio Universitaria, Cobija, Pando. New station from Bolivia. Spanish. Musical program and several identifications and mention of "Universidad Amazonica de Pando, 97.9 MH y ahora tambien onda corta 4730 kilohertz y en los 97.9 MHz frequen-cia modulada transmite Radio Universitaria, desde la ciudad se Cobija…Universidad Amazonica de Pando…en la Radio Univer-sitaria." Email given as radiouap@hotmail.com (Nicholas Eramo, Argentina/HCDX) Audible 1052-1108. SINPO 24332. (Slaen).

2306 UTC on 4828
ZIMBABWE: ZBC. Vernacular announcement to continuous Afro music with occasional .CODAR interference. Poor signal, but improving. (Barbour)

Thanks to our contributors – Have you sent in YOUR logs?
Send to Gayle Van Horn, c/o Monitoring Times
English broadcast unless otherwise noted.

Cruising on the Information Highway

Years ago, I would flip through the *World Radio TV Handbook*, and look at all the listings for domestic broadcasters in far flung parts of the world, often wishing I could hear them. I also realized it was improbable that I ever would.

There were occasional exceptions. The odd time, I would hook up with a pen pal, who would exchange tapes with me. Short of taking some dream trip around the world, this was the only way I was going to hear far-flung local stations. It was fun to be able to hear East and West German, Dutch and Soviet local stations, or the famous offshore pirate stations, or even west coast stations from North America. Often, my trading partner would question why I would be interested in boring local radio stations. I would be similarly incredulous when they loved my recordings of what I considered less than interesting, commercial-laden programming from here.

The common denominator was that it was programming that neither of us could normally hear.

And then along came the internet.

Suddenly everything changed, and with a few clicks one could hear radio stations from all around the world, many in close to CD quality. What an opportunity! I started referring to my computer as a powerful, world band radio, that also did some other neat stuff.

This month I'll take a look at this (relatively) new vista that has opened up to us. Summarizing all that's available in terms of radio on the internet in two pages is obviously impossible. There is so much variety that it boggles the mind. It all depends what you are interested in.

There are state broadcasters, who seem to be rushing headlong to embrace the internet as they cut back or abandon their shortwave broadcasts. Talk and music stations worldwide have also embraced the internet, achieving a worldwide audience overnight. And there are an amazing number of individuals who have established their own stations or programs on the internet to fill a niche they feel is missing, with varying degrees of success and professionalism.

For the purpose of this column, we'll look at programming that was always out there, but inaccessible to all but local listeners.

❖ BBC World Service

The BBC World Service was once a station that one could listen to almost around the clock. There were usually a number of frequency choices, and hours and hours of quality programming. And then in recent years, the BBC decided that shortwave to North America was not a priority. Fair enough. So I checked out the BBCWS website, looking for listening options. The BBC solution is simple and straightforward. Buy a satellite radio. Or listen online.

I don't have a satellite radio. So the internet it is.

The beauty of the BBC World Service website is on demand listening. Virtually every program offered by the BBC is available for listening, at one's leisure, for 7 days following the broadcast. To quote those cheesy infomercials that run at 3am: "But wait! There's more!"

Thanks to the internet, it's not only World Service programming that is available on demand, but *all* BBC programming from all of their domestic networks as well.

Here's what I recommend. Play around with the BBC website. Check out the various networks and learn what there is to hear. Some BBC networks offer weekly email newsletters. Others just post upcoming programming to their websites.

I did one little tweak to the way the BBC website appears on my screen. It works for me. Figure out what works for you. When you first go to **www.bbc.co.uk/radio** look for the BBC logo near the top. Nearby it should give you the option of looking at the "UK Version" or the "International Version." I set my browser to show the UK version. This will make it easier to find the many BBC domestic networks, as well as the World Service if you wish. The BBC website and player (accessible at the web page) also organize by program type across all networks. For instance, you can access all BBC comedy shows, or history, or jazz and so on.

Here's a quick survey of what you can find.

BBC 1, 1Xtra, 2, 3 and 6 are music oriented. BBC 1 focuses on "new music." 1Xtra is the home for "new black music" in Britain (their words, not mine). Radio 2 features everything from pop to oldies, big band to country. Radio 3 is the classical music channel. Toss in a sprinkling of Jazz. Radio 6 has a heavier sound. It's where you might find hard and classic rock, concerts and music documentaries.

Radio 4 features factual programs, or as the BBC puts it, Radio 4 is "the home of intelligent speech." For long-time World Service listeners, some old favorites reside here as well, such as **Just a Minute**, **Brain of Britain** and **From Our Own Correspondent**.

Radio 5 features live talk, sports and current affairs.

Radio 7 brings you classic comedy, drama, children's programming and classics of literature.

In addition, there are a multitude of regional and local services, Radio Scotland, Radio Wales, Radio Ulster and any number of stations in cities across Britain.

Some of my favorites include:

On Radio 2, Mark LaMarr's **God's Jukebox** show on Friday nights/Saturday mornings, "the best music of the past 70 years you never knew you liked." **Sounds of the Sixties**, hosted by Brian Matthew. Brian is considered by some the fifth Beatle – he hosted those cool BBC radio shows featuring the Beatles in 1962-63 before they became huge in North America – and is

heard Saturday mornings. **Malcolm Laycock** presents music of the big band era.

On Radio 3, I enjoy **Composer of the Week** with Donald McLeod. As the name implies, a different composer is featured each week, with an indepth look at his/her life, career and music. Five one-hour shows each week. For Jazz fans, try **Jazz Library**, an occasional series, which may be back later in the year. Each Friday a different jazz performer is featured along with a discussion of their most important works.

Radio 4 highlights include current series such as **Brain of Britain**, **Just a Minute**, and **I'm Sorry I Haven't a Clue** (the self-proclaimed antidote to panel games, and, in my opinion, perhaps the funniest program on radio). Radio 4 also has some of the more interesting, indepth programs and series.

Radio 6 is not my favorite BBC station; however, during the 3am hour, 7 days a week, Radio **6 Plays it Again, Overnight**. Each night a different music documentary or episode of a music documentary series is aired.

Radio 7 is a real treasure. Classic comedy from **The Goon Show**, **I'm Sorry I'll Read That Again** (starring a young John Cleese), **Hancock's Half Hour** and **Beyond Our Ken** (featuring many of the cast of the "Carry On" films, including the unforgettable Kenneth Williams), and radio versions of BBC TV favorites like **Dad's Army**; **Yes, Minister;** and **To the Manor Born**. Radio 7 also features 7 hours a day of children's programming, daily dramatizations of works of literature, both modern and classic, and radio drama from soaps (**Westway**) to Sci-Fi to Thrillers.

One of the benefits of having so many BBC networks is the ability to air lengthy series. And I do mean lengthy. The overnight documentary slot on BBC 6 has aired a 52 part series on the history of Rock, as well as lengthy series on The Beatles, Elvis and any number of artists. Radio Ulster and Radio 7 have aired **A Short History of Ireland** (in 240 parts!), and Radio 7 has also aired a history of Britain and the Empire called **This Sceptred Isle**, which takes over a year to complete.

More recently there was a joint production between Radio 3 and 4 called **The Making of Music**. Each weekday, James Naughtie presented a 15 min program on Radio 4, discussing some aspect of the last 1000 years of music. After this program was over, one could switch to Radio 3 and hear an hour of music associated with that day's program. It's wonderful to have access, on demand, to this kind of in-depth programming.

❖ The Rest of the World

We've barely scratched the surface of domestic programming available on the internet. Elsewhere in the English-speaking world, the Australian Broadcasting Corporation, and Radio New Zealand both have national and regional networks.

Programming from the ABC Networks is available online, including ABC Radio National, ABC Newsradio (which features a lot of BBC content) and three music channels including Triple J (new music), Classic FM (much like BBC Radio 3) and dig (Rock, Pop, Jazz, Country). Newsradio also broadcasts Parliament when it is in session. I listened to the debate about Australia's involvement in Iraq in 2003: interesting stuff. In addition, you can hear any ABC local radio broadcast. **www.abc.net.au/radio/**

There are many private stations online in Australia, too. You can hear everything from music to talk, and let me tell you, Australian talk radio is a lot less tame than our own. Really. Try 3AW in Melbourne or 6PR in Perth. **www.mytalk. com.au** will take you to both and more.

It's fascinating to listen to local radio from so far away. In some ways they face issues we can't imagine (yet?) such as drought in the Western Desert. In other ways, though, they discuss the same issues we do in North America. A few hours of Australian talk radio and you truly realize what a small world it is.

❖ New Zealand

"Radio New Zealand National is the station that keeps New Zealand informed and entertained. With its mix of news, current affairs, documentaries and features, drama and music it is the 'voice of New Zealand,' broadcasting programmes that reflect and develop our national identity.

"Radio New Zealand Concert is the fine music network broadcasting mainly classical music, plus specialist programmes covering jazz, contemporary and world music. 'Concert' features music news and interviews, and actively promotes New Zealand music and composition." **www.radionz.co.nz**

❖ South Africa

A few years ago I had a friend in Cape Town. We were discussing our favorite stations at which time she gave me this link. **www.kfm.co.za/index. asp**

K-FM is "the Cape's No. 1 music station." Give it a listen and, other than the accents of the DJs, you couldn't tell if this station was in Chicago, Toronto, London or Sydney. Just further evidence of the pervasiveness of Western music culture.

❖ Canada

CBC Radio One and Two are available online at **www.cbc.ca/local**. Pick a location and listen to the stream.

❖ Something a little different

Radio 101 in Moscow provides you with tens of music streams, featuring every possible musical genre. When I first heard this station, it had a couple of wobbly streams. Now it has almost 40 channels, each offering a number of bit rates for every user from dial up to broadband. Get a taste of the incredible variety of the Russian musical scene today. **www.101.ru/**

Shortwave listeners may be familiar with Radio Medi 1. You can hear it online at **www. medi1.com/medi1/radio.php**

In December, a coup in Fiji became very real to me by accessing a radio station there via the internet. As I mentioned on my website shortly after, "It was a bit surreal, one minute they were interviewing the Prime Minister who seemed for all intents and purposes powerless, then playing *Oh Little Town of Bethlehem* by Elvis or *Radio Gaga* by Queen… One DJ was reading the latest headlines he grabbed off the internet, from BBC and Google…Interesting radio indeed."

When events happen halfway around the world, you now have the opportunity to hear reportage as it happens, from the source. Don't neglect this opportunity.

Internet radio is a great tool to hear worldwide programming. Unless of course, rights' squabbles kill it off. In which case, drop me a postcard, we'll swap tapes.

❖ Updating a past column

Fred,

I read your article in The July Monitoring Times about DX shows and wanted to let you know that RAE still broadcasts their DX show. The last time I heard it was in the spring, March I believe, and it was a Thursday night. I usually get pretty good reception of RAE here on Cape Cod throughout the year, especially in the summer. In fact I'm listening right now on 11710 @ 0215.

73's, Steve Wood, South Yarmouth, MA

Enjoy the fall weather. Take care until the next edition of *Programming Spotlight*.

THE QSL REPORT

VERIFICATIONS RECEIVED BY OUR READERS

Gayle Van Horn, W4GVH
gaylevanhorn@monitoringtimes.com

Get ready for MW season

Not only have shortwave radio conditions improved by September, but mediumwave DXers are getting ready for their prime listening and QSLing season, too.

Similar to shortwave, the reporting process begins with a basic reception report that includes the date, time (in the station's local time) frequency and program details. Information should include public service announcements, time checks, jingles, announcer names, commercials, or programming format.

Don't forget artist or song titles, but don't get bogged down with an extensive play-by-play description or word-for-word transcription over a long period of time. Sporting events usually include pre-game programming that includes interviews. Sport scores and game wrap-up shows are perfect for reporting.

Keep the reporting friendly and conversational. A brief explanation of the medium wave hobby and QSLing is a good idea for staff personnel who have no idea this is actually a hobby! Letters should be sent to the Program Director, General Manager or Chief Engineer. The latter should have an understanding of the hobby, and sometimes you find the engineer is an amateur radio operator or a hobbyist.

Many stations offer an email address, so check to see if the station has a web address. If not, you can locate a physical address by a Google search at **www.google.com**

If a follow-up report is needed in three or four months, keep it courteous and to the point. Good luck, as the medium wave stations begin rolling for the AM season, and don't forget to send in your QSL contributions.

ALBANIA

Radio Tirana International, 13720 kHz. Partial data RTI card signed bu Drita Cico-Head of Monitoring Center, plus souvenir postcard. Received in 12 days for an email report to *radiotirana-english@hotmail.com*. (Mick Delmage, Sherwood Park, Alberta, Canada). Website: **www.rtsh.com.al**. Address: External Service, Rruga Ismail Qemali Nr. 11, Tirana, Albania. (World QSL Book)

AMATEUR RADIO

Guatemala TG9NX, 15 meters SSB. Full data two color cards. Received in 77 days for $2.00 US to N4FKZ. Address: Francisco E. Capuano, 2500 SW 6th St., Apt. 501, Miami, FL 33135-2953 USA. (Larry Van Horn, NC)

Spain EA3NW, 12 meters SSB. Full data two-color card. Received in 462 days via ARRL bureau. (Van Horn)

BRAZIL

Radio Clube do Pará 4885 kHz. Beautiful multi-colored photo card of Belém, signed by Camilo Centeno, plus English letter. Received in 31 days for a CD report and $1.00 US. Station address: Almirante Barroso 2190, 3° andar, Marco CEP 66.093-020 Belém, Pará, Brazil. (Delmage)

CLANDESTINE

Radio Saa 15180 kHz via Issoudin, France. Full data card with power, antenna and site noted. Received in 15 days for a CD mp3 report and prepared English/French QSL card (not used). QSL address: TDF-Radio Business Unit, Shortwave Department, 10, rue d'Oradour sur Glane, 75732 Paris, Cedex15 France. (Ed Kusalik, Alberta, Canada) Station operates in opposition to Nigeria, and is brokered by TDP-Belgium. Website: **www.tdp.info/** Email: *info@transmitter.org* (World QSL Book)

DIEGO GARCIA

American Forces Radio 12759 kHz USB. Full data AFRTS logo card with site notation, signed by Robert Wilkner. Received in 15 days for an email report to *qsl@dodmedia.osd.mil* (Kusalik)

MEDIUM WAVE

CHHA 1610 kHz AM. Full data prepared QSL card signed by Michelle Maron-Executive Director, plus personal letter on San Lorenzo Latin American Community Centre letterhead. Received in one month for an AM report and an SASE. Station address: SLLACC, 22 Wenderly Dr., Toronto, Ontario, Canada M6B 2N9. (Bill Wilkins, Springfield, MO).

CKDO 1580 kHz AM. Full data antenna site card signed by Shawn Smith. Received in 14 days for an AM report. Station address: 1200 Airport Blvd., Suite 207, Oshawa, Ontario, Canada L1J 8P5. (Delmage)

JOVG Hakodate 675 kHz. Full data QSL card unsigned, plus letter. Received for an AM report. Station address: 13-1 Chitose-cho, Hakodate-shi, Hokkaido 040-8680 Japan. (Craig Edwards, Nhulunbuy, Northern Territory, Australia)

KMPH 840 kHz AM. Friendly letter with verification on station letterhead, signed by Jerry Moore-Chief Operator. Received in seven days for an AM follow up report to Chief Engineer. Station address: 1192 Norwegian Ave., Modesto, CA 95350 USA. (Patrick Martin, Seaside, OR)

KXLX 700 kHz AM. Full data verification letter signed by Bud Nameck-Program Director. Received in nine days for an AM report and a SASE. Station address: 500 West Boone Ave., Spokane, WA 99201-2497 USA. (Martin)

WTDY 1670 kHz AM. Partial data letter unsigned, plus station info sheet. Received in 23 months for two follow ups to Randy Hawke-Operations Manager. Station address: Mid-West Family Broadcasting, 730 Rayovac Dr., Madison, WI 53711 USA. (Jim Pogue, Memphis, TN)

PIRATE

Sunshine Radio 6925 kHz (via Grasscutter Radio). Verification sheet, plus fill-in sheet for Grasscutter Radio and photo QSL sheet of the Yeasu FT-757GX. Operator included a nice dual station CD of programming. Received in 12 days for a report to *grasscutter@yahoo.com* (Kusalik)

WTCR 6925 kHz USB. Full data flying saucer QSL card, signed by Dr. Moribus. Received in 18 days for a pirate report and $1.00 US. Maildrop: P.O. Box 1, Belfast, NY 14895 USA. (Dan Srebnick, Aberdeen, NJ)

UGANDA

Radio Dunamis 4750 kHz. Full data color QSL card of transmitter site at Mukono, Uganda. Received for an email report to *dunamis4.750@hotmail.com*. QSL address: High Adventure Gospel Communications Ministries, HAGCM, P.O. Box 425, Station E, Toronto, Ontario, Canada M6H 4E3. Website: **www.biblevoice.org** (Jari Savolainen, Kuusankoski, Finland).

Dunamis Broadcasting
A Christian Voice for Uganda
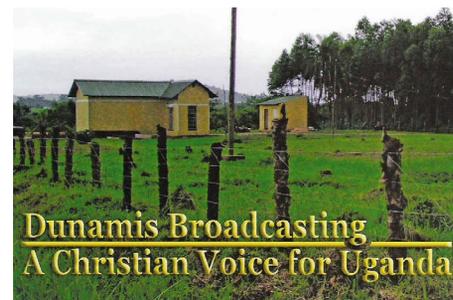
USA

Checkerboard Lounge via WBCQ 7415 kHz. Full data *Special Edition* QSL card #1 of 100, signed by Roscoe the Bartender. Card is vintage photo of blues artist Hound Dog Taylor, Lefty Dizz and James Cotton. Received in nine days for an English report and an SASE. QSL address: The Checkerboard Lounge, 7914 Dodge Rd., Suite 210, Omaha, NE 68114 USA. Website: **www.wbcq.com/checkerboard**. (Gayle Van Horn, NC)

WPZS256 Newport, Oregon, 1650 kHz (10 watts). Verification letter, signed by Dan Prodzinski-ODOT Dispatch NWTOC. Received in three days. QSL address: ODOT Transportation Operations Center, 455 Airport Rd. SE, Bldg. B, Salem, OR 97301. USA. WPZS256 Coos Bay, Oregon. Verification received with WPZS256. Both stations share same call sign. (Martin)

HOW TO USE THE SHORTWAVE GUIDE

0000-0100 twhfa   USA, Voice of America   5995am   6130ca   7405am   9455af

① ② ⑤   ③   ④   ⑥ ⑦

Convert your time to UTC.

Broadcast time on ① and time off ② are expressed in Coordinated Universal Time (UTC) – the time at the 0 meridian near Greenwich, England. To translate your local time into UTC, first convert your local time to 24-hour format, then add (during Daylight Saving Time) 4, 5, 6 or 7 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each hour.

Note that all *dates*, as well as times, are in UTC; for example, a show which might air at 0030 UTC *Sunday* will be heard on *Saturday* evening in America (in other words, 8:30 pm Eastern, 7:30 pm Central, etc.).

Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. English broadcasts are listed by UTC time on ① , then alphabetically by country ③, followed by the station name ④. (If the station name is the same as the country, we don't repeat it, e.g., "Vanuatu, Radio" [Vanuatu].)

If a broadcast is not *daily*, the days of broadcast ⑤ will appear in the column following the time of broadcast, using the following codes:

Codes
s/Sun	Sunday
m/Mon	Monday
t	Tuesday
w	Wednesday
h	Thursday
f	Friday
a/Sat	Saturday
occ:	occasional
DRM:	Digital Radio Mondiale
irreg	Irregular broadcasts
vl	Various languages

Choose the most promising frequencies for the time, location and conditions.

The frequencies ⑥ follow to the right of the station listing; all frequencies are listed in kilohertz (kHz). Not all listed stations will be heard from your location and virtually none of them will be heard all the time on all frequencies.

Shortwave broadcast stations change some of their frequencies at least twice a year, in April and October, to adapt to seasonal conditions. But they can also change in response to short-term conditions, interference, equipment problems, etc. Our frequency manager coordinates published station schedules with confirmations and reports

from her monitoring team and *MT* readers to make the Shortwave Guide up-to-date as of one week before print deadline.

To help you find the most promising signal for your location, immediately following each frequency we've included information on the target area ⑦ of the broadcast. Signals beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible.

Target Areas
af:	Africa
al:	alternate frequency (occasional use only)
am:	The Americas
as:	Asia
ca:	Central America
do:	domestic broadcast
eu:	Europe
me:	Middle East
na:	North America
oc:	Oceania
pa:	Pacific
sa:	South America
va:	various

MT MONITORING TEAM

Gayle Van Horn
Frequency Manager
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Larry Van Horn, MT Asst. Editor
larryvanhorn@monitoringtimes.com

Shortwave Broadcast Bands

kHz	Meters
2300-2495	120 meters (Note 1)
3200-3400	90 meters (Note 1)
3900-3950	75 meters (Regional band, used for broadcasting in Asia only)
3950-4000	75 meters (Regional band, used for broadcasting in Asia and Europe)
4750-4995	60 meters (Note 1)
5005-5060	60 meters (Note 1)
5730-5900	49 meter NIB (Note 2)
5900-5950	49 meter WARC-92 band (Note 3)
5950-6200	49 meters
6200-6295	49 meter NIB (Note 2)
6890-6990	41 meter NIB (Note 2)
7100-7300	41 meters (Regional band, not allocated for broadcasting in the western hemisphere) (Note 4)
7300-7350	41 meter WARC-92 band (Note 3)
7350-7600	41 meter NIB (Note 2)
9250-9400	31 meter NIB (Note 2)
9400-9500	31 meter WARC-92 band (Note 3)
9500-9900	31 meters
11500-11600	25 meter NIB (Note 2)
11600-11650	25 meter WARC-92 band (Note 3)
11650-12050	25 meters
12050-12100	25 meter WARC-92 band (Note 3)
12100-12600	25 meter NIB (Note 2)
13570-13600	22 meter WARC-92 band (Note 3)
13600-13800	22 meters
13800-13870	22 meter WARC-92 band (Note 3)
15030-15100	19 meter NIB (Note 2)
15100-15600	19 meters
15600-15800	19 meter WARC-92 band (Note 3)
17480-17550	17 meter WARC-92 band (Note 3)
17550-17900	17 meters
18900-19020	15 meter WARC-92 band (Note 3)
21450-21850	13 meters
25670-26100	11 meters

Notes
Note 1 Tropical bands, 120/90/60 meters are for broadcast use only in designated tropical areas of the world.
Note 2 Broadcasters can use this frequency range on a (NIB) non-interference basis only.
Note 3 WARC-92 bands are allocated officially for use by HF broadcasting stations in 2007
Note 4 WRC-03 update. After March 29, 2009, the spectrum from 7100-7200 kHz will no longer be available for broadcast purposes and will be turned over to amateur radio operations worldwide

0000 UTC - 8PM EDT / 7PM CDT / 5PM PDT

0000	0005		Greece, Voice of	7475eu	9420eu	15640eu
0000	0015		Japan, Radio Japan/NHK World			13650as
			17810as			
0000	0027		Czech Rep, Radio Prague	7345na	9440na	
0000	0030		Australia, HCJB Global	15525va		
0000	0030		Australia, Radio Australia	9660as	12080as	
			13670as	15240pa	17715as	17795va
0000	0030		Burma, Dem Voice of Burma	5955eu		
0000	0030		Egypt, Radio Cairo	9460na		
0000	0030		UK, BBC World Service	3915as	5970as	
			17615as			
0000	0030		USA, Voice of America	7555as		
0000	0045		India, All India Radio	9690as	9705as	
			11620as	11645as	13605as	
0000	0045		USA, WYFR/Family Radio FL	17805am		
0000	0056		Romania, Radio Romania Intl	9775na	11790na	
0000	0057		Canada, Radio Canada Intl	11700as		
0000	0058		Germany, Deutsche Welle	7245as	13730as	
			15595as			
0000	0059		Spain, Radio Exterior Espana	6055na		
0000	0100		Anguilla, University Network	6090am		
0000	0100		Australia, ABC NT Alice Springs			2310do
			4835do			
0000	0100		Australia, ABC NT Katherine	5025do		
0000	0100		Australia, ABC NT Tennant Creek			4910do
0000	0100		Canada, CFRX Toronto ON	6070na		
0000	0100		Canada, CFVP Calgary AB	6030na		
0000	0100		Canada, CKZN St John's NF	6160na		
0000	0100		Canada, CKZU Vancouver BC		6160na	
0000	0100		China, China Radio Intl	6020na	6075as	
			7180as	9570as	9725as	11885as
			13750as	15115as		
0000	0100		Costa Rica, University Network		5030va	
			6150va	7375va	9725va	
0000	0100		Guyana, Voice of	3291do		
0000	0100		Japan, Radio Japan/NHK World		6145na	
0000	0100		Malaysia, RTM/Trax FM	7295as		
0000	0100		Netherlands, Radio	9845na		
0000	0100		New Zealand, Radio NZ Intl	15720pa		
0000	0100	DRM	New Zealand, Radio NZ Intl	13730pa		
0000	0100	vl	Papua New Guinea, Wantok R. Light	7325va		
0000	0100		Russia, Voice of	7250na	9665na	12755na
0000	0100		Singapore, MediaCorp Radio	6150do		
0000	0100		UK, BBC World Service	6195as	9580as	
			9740as	11955as	15335as	15360as
0000	0100	f	UK, Bible Voice BC	6140as		
0000	0100		Ukraine, Radio Ukraine Intl	7440eu		
0000	0100		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb		
0000	0100		USA, KAIJ Dallas TX	5755va		
0000	0100		USA, KTBN Salt Lake City UT	7505na	15590na	
0000	0100	twhfas	USA, WBCQ Monticello ME	9330am		
0000	0100		USA, WBOH Newport NC	5920am		
0000	0100		USA, WEWN Vandiver AL	5810na		
0000	0100		USA, WHRA Greenbush ME	7520na		
0000	0100		USA, WHRI Cypress Creek SC		7315am	
			7520am			
0000	0100	mtwhfa	USA, WHRI Cypress Creek SC		9515am	
0000	0100	Sun	USA, WHRI Cypress Creek SC		7490am	
0000	0100		USA, WINB Red Lion PA	9265am		
0000	0100		USA, WRMI Miami FL	9955va		
0000	0100		USA, WTJC Newport NC	9370na		
0000	0100		USA, WWCR Nashville TN	5070na	7465na	
			13845na			
0000	0100	mtwhfa	USA, WWRB Manchester TN	5745am		
0000	0100		USA, WWRB Manchester TN	3185va	5050va	
			6890na			
0000	0100		USA, WYFR/Family Radio FL	6065am	9595am	
			11835na			
0005	0100		Canada, Radio Canada Intl	6100na		
0030	0045	Sun	Germany, Pan American BC	6165as		
0030	0100		Australia, Radio Australia	9660as	12080as	
			13670as	15240pa	15415as	17715as
0030	0100		Lithuania, Radio Vilnius	11690na		
0030	0100		Thailand, Radio	5890na	9570af	
0030	0100	fas	UK, Bible Voice BC	9620as		
0030	0100		USA, Voice of America	9715va	9780va	
			11725va	15185va	15205va	15290va
			15560va	17820va		
0035	0058	Sun/Mon	Austria, Radio Austria Intl	9870am		
0043	0058	twhfa	Austria, Radio Austria Intl	9870am		
0055	0100		Italy, RAI Italia	11800na		

0100 UTC - 9PM EDT / 8PM CDT / 6PM PDT

0100	0104		Canada, Radio Canada Intl	6100na		

0100	0115		Italy, RAI Italia	11800na		
0100	0127		Czech Rep, Radio Prague	6200na	7345na	
0100	0127		Slovakia, Radio Slovakia Int	5930na	9440sa	
0100	0200		Anguilla, University Network	6090am		
0100	0200		Australia, ABC NT Katherine	5025do		
0100	0200		Australia, ABC NT Tennant Creek	4910do		
0100	0200		Australia, Radio Australia	9660as	12080as	
			13670as	15240pa	15415as	17715as
			17750as	17775as	17795as	
0100	0200		Canada, CFRX Toronto ON	6070na		
0100	0200		Canada, CFVP Calgary AB	6030na		
0100	0200		Canada, CKZN St John's NF	6160na		
0100	0200		Canada, CKZU Vancouver BC	6160na		
0100	0200		China, China Radio Intl	6020na	9470eu	
			9535as	9570na	9580na	9725eu
			9790na	11870as	15115as	15785as
0100	0200		Costa Rica, University Network	5030va		
			6150va	7375va	9725va	
0100	0200		Cuba, Radio Havana	6000na	6180na	
0100	0200		Guyana, Voice of	3291do		
0100	0200		Indonesia, Voice of	9525as	11785pa	
			15150al			
0100	0200		Japan, Radio Japan/NHK World	5960va		
			11780as	11935na	15235as	15325as
			17560va	17685pa	17810as	17825va
0100	0200		Malaysia, RTM/Trax FM	7295as		
0100	0200		Netherlands, Radio	9845na		
0100	0200		New Zealand, Radio NZ Intl	15720pa		
0100	0200	DRM	New Zealand, Radio NZ Intl	13730pa		
0100	0200		North Korea, Voice of Korea	7140as	9345as	
			9730as	11735ca	13760ca	15180ca
0100	0200	vl	Papua New Guinea, Wantok R. Light	7325va		
0100	0200		Russia, Voice of	7250na	9665na	12775na
0100	0200		Singapore, MediaCorp Radio	6150do		
0100	0200		Sri Lanka, SLBC	6005as	9770as	15745as
0100	0200		Taiwan, Radio Taiwan Intl	11875as	15465na	
0100	0200		UK, BBC World Service	6195as	9410as	
			9580as	11750as	11955as	15310as
			15335as	15360as		
0100	0200	f	UK, Bible Voice BC	6140as		
0100	0200		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb		
0100	0200		USA, KAIJ Dallas TX	5755va		
0100	0200		USA, KTBN Salt Lake City UT	7505na		
0100	0200		USA, KWHR Naalehu HI	17655as		
0100	0200		USA, Voice of America	7430va	9780va	
			11705va			
0100	0200	Sun	USA, WBCQ Monticello ME	9330am		
0100	0200		USA, WBCQ Monticello ME	5110am	7415na	
			9330na			
0100	0200		USA, WBOH Newport NC	5920am		
0100	0200		USA, WEWN Vandiver AL	5810na		
0100	0200		USA, WHRA Greenbush ME	5890na		
0100	0200		USA, WHRI Cypress Creek SC		5850am	
			7315am	7490am		
0100	0200		USA, WINB Red Lion PA	9265am		
0100	0200	sm	USA, WRMI Miami FL	9955va		
0100	0200	twhfa	USA, WRMI Miami FL	7385va		
0100	0200		USA, WTJC Newport NC	9370na		
0100	0200		USA, WWCR Nashville TN	3215na	5070na	
			7465na	13845na		
0100	0200	mtwhfa	USA, WWRB Manchester TN	5745am		
0100	0200		USA, WWRB Manchester TN	3185va	5050va	
			6890na			
0100	0200		USA, WYFR/Family Radio FL	6065am	9595am	
0100	0200		Uzbekistan, CVC International		11790as	
0105	0128	Sun/Mon	Austria, Radio Austria Intl	9870am		
0113	0128	twhfa	Austria, Radio Austria Intl	9870am		
0115	0130	Sat	Australia, HCJB Global	15405va		
0130	0200		Iran, Voice of the Islamic Rep	7235na	9495na	
0130	0200		Sweden, Radio	6010na	11675va	
0130	0200	twhfa	USA, Voice of America	6040am	13740am	
0140	0200		Vatican City, Vatican Radio	5915va	7335va	
0143	0158	twhfa	Austria, Radio Austria Intl	9870am		
0145	0200	twhfas	Albania, Radio Tirana	6120eu	7425na	

0200 UTC - 10PM EDT / 9PM CDT / 7PM PDT

0200	0215		Croatia, Croatian Radio	6165na	9925eu	
0200	0230		Iran, Voice of the Islamic Rep	7235na	9495na	
0200	0230		South Korea, KBS World Radio		15575sa	
0200	0245		USA, WYFR/Family Radio FL	11835na		
0200	0258	DRM	New Zealand, Radio NZ Intl	13730pa		
0200	0300		Anguilla, University Network	6090am		
0200	0300	twhfa	Argentina, RAE	11710am		
0200	0300		Australia, ABC NT Alice Springs			2310do
			4835do			
0200	0300		Australia, ABC NT Katherine	5025do		

0200	0300		Australia, ABC NT Tennant Creek	4910do
0200	0300		Australia, Radio Australia	9660as 12080as
			13670as 15240pa 15415as 15515as	
			17750va 21725va	
0200	0300		Bulgaria, Radio 9700na 11700na	
0200	0300		Canada, CFRX Toronto ON 6070na	
0200	0300		Canada, CFVP Calgary AB 6030na	
0200	0300		Canada, CKZN St John's NF 6160na	
0200	0300		Canada, CKZU Vancouver BC	6160na
0200	0300		China, China Radio Intl 11770as 13640as	
0200	0300		Costa Rica, University Network	5030va
			6150va 7375va 9725va	
0200	0300		Cuba, Radio Havana 6000na 6180na	
0200	0300		Egypt, Radio Cairo 7270na	
0200	0300		Guyana, Voice of 3291do	
0200	0300		Malaysia, RTM/Trax FM 7295as	
0200	0300	DRM	Netherlands, Radio 9405va	
0200	0300		New Zealand, Radio NZ Intl 15720pa	
0200	0300		North Korea, Voice of Korea 13650as 15100as	
0200	0300	vl	Papua New Guinea, Wantok R. Light 7325va	
0200	0300		Philippines, Radio Pilipinas 11880va 15285va	
			15510va	
0200	0300		Russia, Voice of 9665na 9860na 13635na	
			13775na	
0200	0300		Singapore, MediaCorp Radio 6150do	
0200	0300		Sri Lanka, SLBC 6005as 9770as 15745as	
0200	0300		Thailand, Radio 5890na	
0200	0300		UK, BBC World Service 6030af 6195as	
			11750as 11955as 15310as 15335as	
			15360as 17790as	
0200	0300		USA, American Forces Radio 4319usb 5446usb	
			5765usb 6350usb 7811usb 10320usb	
			12133usb 13362usb	
0200	0300		USA, KAIJ Dallas TX 5755va	
0200	0300		USA, KJES Vado NM 7555na	
0200	0300		USA, KJES Vado NM 7555na	
0200	0300		USA, KTBN Salt Lake City UT 7505na	
0200	0300		USA, KWHR Naalehu HI 17655as	
0200	0300		USA, WBCQ Monticello ME 5110am 7415na	
			9330na	
0200	0300	Sun	USA, WBCQ Monticello ME 9330am	
0200	0300		USA, WBOH Newport NC 5920am	
0200	0300		USA, WEWN Vandiver AL 5810na	
0200	0300		USA, WHRA Greenbush ME 5890na	
0200	0300		USA, WHRI Cypress Creek SC	5850am
			7315am	
0200	0300		USA, WINB Red Lion PA 9265am	
0200	0300	sm	USA, WRMI Miami FL 9955va	
0200	0300	twhfa	USA, WRMI Miami FL 7385na	
0200	0300		USA, WTJC Newport NC 9370na	
0200	0300		USA, WWCR Nashville TN 3215na 5070na	
			5935na	
0200	0300	mtwhfa	USA, WWRB Manchester TN 5745am	
0200	0300		USA, WWRB Manchester TN 3185va 5050va	
			6890na	
0200	0300		USA, WYFR/Family Radio FL 5985am 11855am	
0200	0300		Uzbekistan, CVC International 11790as	
0200	3000		Taiwan, Radio Taiwan Intl 5950na 9680am	
0215	0230		Nepal, Radio 3230as 5005as 6100as	
			7165as	
0230	0300	twhfas	Albania, Radio Tirana 6115eu 7425eu	
0230	0300		South Korea, KBS World Radio 9560na	
0230	0300		Sweden, Radio 6010na	
0245	0300		India, All India Radio 7420as	
0245	0300		Myanmar, Radio 9730do	
0250	0300		Vatican City, Vatican Radio 6040va 7305va	
0255	0300	vl	Rwanda, Radio 6055do	
0259	0300	DRM	New Zealand, Radio NZ Intl 11675pa	

0300 UTC - 11PM EDT / 10PM CDT / 8PM PDT

0300	0320		Vatican City, Vatican Radio 6040va 7305va	
			15560va	
0300	0327		Czech Rep, Radio Prague 7345na 9870na	
0300	0330		Egypt, Radio Cairo 7270na	
0300	0330		Myanmar, Radio 9730do	
0300	0330		Philippines, Radio Pilipinas 11880va 15285va	
			15510va	
0300	0330		USA, KJES Vado NM 7555na	
0300	0330		USA, Voice of America 4930af 6080af	
			7340af 9885af 12080af 15580af	
0300	0330	Sun	USA, WBCQ Monticello ME 9330am	
0300	0330		Vatican City, Vatican Radio 9660af	
0300	0355		South Africa, Channel Africa 5960af	
0300	0356		Romania, Radio Romania Intl 6150va 9645na	
			11895va 15220va	
0300	0359		South Africa, Channel Africa 3345af	
0300	0400		Anguilla, University Network 6090am	
0300	0400		Australia, ABC NT Alice Springs 2310do	

			4835do	
0300	0400		Australia, ABC NT Katherine 5025do	
0300	0400		Australia, ABC NT Tennant Creek 4910do	
0300	0400		Australia, Radio Australia 9660as 12080as	
			13670as 15240pa 15415as 15515as	
			17750va 21725va	
0300	0400	twhfas	Canada, CBC NQ SW Service 9625na	
0300	0400		Canada, CFRX Toronto ON 6070na	
0300	0400		Canada, CFVP Calgary AB 6030na	
0300	0400		Canada, CKZN St John's NF 6160na	
0300	0400		Canada, CKZU Vancouver BC 6160na	
0300	0400		China, China Radio Intl 9690na 9790na	
			11770as 15110as 15120as 15785as	
0300	0400		Costa Rica, University Network 5030va	
			6150va 7375va 9725va	
0300	0400		Cuba, Radio Havana 6000na 6180na	
0300	0400		Germany, Deutsche Welle 11695as 13810as	
0300	0400		Guyana, Voice of 3291do	
0300	0400		Japan, Radio Japan/NHK World 21610pa	
0300	0400		Malaysia, RTM/Trax FM 7295as	
0300	0400		Malaysia, RTM/Voice of Malaysia 6175as	
			9750as 15295as	
0300	0400		New Zealand, Radio NZ Intl 15720pa	
0300	0400	DRM	New Zealand, Radio NZ Intl 11675pa	
0300	0400		North Korea, Voice of Korea 7140as 9345as	
			9730as	
0300	0400		Oman, Radio Oman 15355as	
0300	0400	vl	Papua New Guinea, Wantok R. Light 7325va	
0300	0400	DRM	Russia, Voice of 15735as	
0300	0400		Russia, Voice of 9435na 9515na 9665na	
			9860na 9880na 12065na 13635na	
0300	0400	vl	Rwanda, Radio 6055do	
0300	0400		Singapore, MediaCorp Radio 6150do	
0300	0400		Sri Lanka, SLBC 6005as 9770as 15745as	
0300	0400		Taiwan, Radio Taiwan Intl 5950am 15215sa	
0300	0400		Turkey, Voice of 5975va 7270va	
0300	0400	Sun	UK, BBC World Service 11760as	
0300	0400		UK, BBC World Service 3255af 6005af	
			6030af 6190af 6195af 9750af	
			12035af 15310as 15360as 15575as	
			17760as 21660as	
0300	0400		Ukraine, Radio Ukraine Intl 7440na	
0300	0400		USA, American Forces Radio 4319usb 5446usb	
			5765usb 6350usb 7811usb 10320usb	
			12133usb 13362usb	
0300	0400		USA, KAIJ Dallas TX 5755va	
0300	0400		USA, KTBN Salt Lake City UT 7505na	
0300	0400		USA, KWHR Naalehu HI 17655as	
0300	0400		USA, WBCQ Monticello ME 5110am 7415na	
0300	0400		USA, WBOH Newport NC 5920am	
0300	0400		USA, WEWN Vandiver AL 5810na	
0300	0400		USA, WHRA Greenbush ME 5890na	
0300	0400	mtwhf	USA, WHRI Cypress Creek SC 5835am	
0300	0400		USA, WHRI Cypress Creek SC 5850am	
			7490am	
0300	0400	Sat/Sun	USA, WHRI Cypress Creek SC 7315am	
0300	0400		USA, WINB Red Lion PA 9265am	
0300	0400		USA, WRMI Miami FL 9955va	
0300	0400		USA, WTJC Newport NC 9370na	
0300	0400		USA, WWCR Nashville TN 3215na 5070na	
			5935na 7465na	
0300	0400		USA, WWRB Manchester TN 3185va 5050va	
0300	0400		USA, WYFR/Family Radio FL 6065na 9505na	
			11740na 15255na	
0300	0400		Uzbekistan, CVC International 13680as	
0330	0335		Bahrain, Radio Bahrain 6010as	
0330	0345		Israel, Kol Israel 9345eu 11590va 17600va	
0330	0355		Vietnam, Voice of 6175na	
0330	0357		Czech Rep, Radio Prague 6080as 9445as	
			11600as	
0330	0400		UK, BBC World Service 15420af	
0330	0400		USA, Voice of America 4930af 6080af	
			9885af 12080af 15580af	
0330	0400	twhfas	USA, WBCQ Monticello ME 9330am	

0400 UTC - 12AM EDT / 11PM CDT / 9PM PDT

0400	0430		Australia, Radio Australia 9660as 12080as	
			13670as 15240pa 15515as 17750va	
			21725va	
0400	0430	mtwhf	France, Radio France Intl 9805af 11995af	
0400	0430		Sri Lanka, SLBC 6005as 9770as 15745as	
0400	0430	Sat/Sun	USA, WWRB Manchester TN 5745am	
0400	0445		USA, WYFR/Family Radio FL 6065na 9505na	
0400	0458		New Zealand, Radio NZ Intl 15720pa	
0400	0458	DRM	New Zealand, Radio NZ Intl 11675pa	
0400	0500		Anguilla, University Network 6090am	
0400	0500		Armenia, CVC International 15515as	
0400	0500		Australia, ABC NT Alice Springs 2310do	
			4835do	

0400	0500		Australia, ABC NT Katherine	5025do	
0400	0500		Australia, ABC NT Tennant Creek		4910do
0400	0500	twhfas	Canada, CBC NQ SW Service	9625do	
0400	0500		Canada, CFRX Toronto ON	6070na	
0400	0500		Canada, CKZN St John's NF	6160na	
0400	0500		Canada, CKZU Vancouver BC		6160na
0400	0500		China, China Radio Intl	6020na	6080na
			13750as	15120as	15785as 17725as
			17855as		
0400	0500		Costa Rica, University Network		5030va
			6150va	7375va	9725va
0400	0500		Cuba, Radio Havana	6000na	6180na
0400	0500		Germany, Deutsche Welle	7225af	7245af
			12045af		15445af
0400	0500		Guyana, Voice of 3291do		
0400	0500		Malaysia, RTM/Trax FM	7295as	
0400	0500		Malaysia, RTM/Voice of Malaysia		6175as
			9750as		15295as
0400	0500		Netherlands, Radio		6165na
0400	0500	vl	Papua New Guinea, Wantok R. Light	7325va	
0400	0500		Russia, Voice of 9435na	9515na	9860na
			9880na	13635na	13775na
0400	0500	DRM	Russia, Voice of 15735na		
0400	0500	vl	Rwanda, Radio 6055do		
0400	0500		Singapore, MediaCorp Radio 6150do		
0400	0500	vl	Uganda, Radio 4976do	5026do	
0400	0500	DRM	UK, BBC World Service	7440eu	
0400	0500		UK, BBC World Service	3255af	6005af
			6190af	7120af	7160af 9410eu
			11760as	12035af	12095eu 15310as
			15360af	15460af	15565eu 15575as
			17760as	17790as	21660as
0400	0500		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb 10320usb
			12133usb	13362usb	
0400	0500		USA, KAIJ Dallas TX	5755va	
0400	0500		USA, KTBN Salt Lake City UT	7505na	
0400	0500		USA, KWHR Naalehu HI	17655as	
0400	0500		USA, Voice of America	4930af	4960af
			6080af	9575af	11835af 12080af
			15580af		
0400	0500		USA, WBCQ Monticello ME	5110am	7415na
0400	0500		USA, WBOH Newport NC	5920am	
0400	0500		USA, WEWN Vandiver AL	5810na	
0400	0500		USA, WHRA Greenbush ME	5890na	
0400	0500	mtwhf	USA, WHRI Cypress Creek SC		5835am
0400	0500	Sat/Sun	USA, WHRI Cypress Creek SC		7315am
0400	0500		USA, WHRI Cypress Creek SC		7490am
0400	0500		USA, WMLK Bethel PA	9265va	
0400	0500		USA, WRMI Miami FL	9955va	
0400	0500		USA, WTJC Newport NC	9370na	
0400	0500		USA, WWCR Nashville TN	3215na	5070na
			5890na	5935na	
0400	0500		USA, WWRB Manchester TN	3185va	5050va
			6890va		
0400	0500		USA, WYFR/Family Radio FL	6855na	7780va
			9715am		
0400	0500		Uzbekistan, CVC International		13680as
0430	0500		Australia, Radio Australia	9660as	12080as
			13670as	15240pa	15415as 15515va
			17750va	21725va	
0430	0500		Nigeria, Radio/Kaduna		6090do
0430	0500		Swaziland, TWR 3200af	4775af	
0430	0500	Sat	USA, WWRB Manchester TN	5745am	
0445	0500		Italy, RAI Italia 6110af	6145af	7235af
0459	0500	DRM	New Zealand, Radio NZ Intl 9890pa		

0500 UTC - 1AM EDT / 12AM CDT / 10PM PDT

0500	0507	twhfas	Canada, CBC NQ SW Service	9625na	
0500	0515	Sun	Sri Lanka, SLBC 6005as	9770as	15745as
0500	0530	mtwhf	France, Radio France Intl	11995af	13680af
0500	0530		Germany, Deutsche Welle	5945af	9700af
0500	0530		Vatican City, Vatican Radio	4005eu	7250eu
			9660af	11625af	13765af
0500	0555		South Africa, Channel Africa	9685af	
0500	0559		South Africa, Channel Africa	7240af	
0500	0600		Anguilla, University Network	6090am	
0500	0600		Armenia, CVC International	15515as	
0500	0600		Australia, ABC NT Alice Springs		2310do
			4835do		
0500	0600		Australia, ABC NT Katherine	5025do	
0500	0600		Australia, ABC NT Tennant Creek		4910do
0500	0600		Australia, Radio Australia	9660as	12080as
			13670as	15160as	15240pa 15515as
			17750va		
0500	0600		Bhutan, BBS 6035as		
0500	0600		Canada, CFRX Toronto ON	6070na	
0500	0600		Canada, CKZN St John's NF	6160na	
0500	0600		Canada, CKZU Vancouver BC		6160na

0500	0600		China, China Radio Intl	6020na	6190na
			11710af	11880as	15350as 15465as
			17505as	17540as	17725as 17855as
0500	0600		Costa Rica, University Network		5030va
			6150va	7375va	9725va
0500	0600		Cuba, Radio Havana	6000na	6060na
			6180na	9550va	9600va 11760va
0500	0600		Germany, CVC Intl/Voice Africa		9430af
0500	0600		Guyana, Voice of 3291do		
0500	0600		Japan, Radio Japan/NHK World		5975eu
			6110na	7230eu	15195as 17810as
			21755pa		
0500	0600		Kuwait, Radio Kuwait	15110as	
0500	0600		Malaysia, RTM/Trax FM	7295as	
0500	0600		Malaysia, RTM/Voice of Malaysia		6175as
			9750as		15295as
0500	0600		New Zealand, Radio NZ Intl	9615pa	
0500	0600	DRM	New Zealand, Radio NZ Intl	9890pa	
0500	0600		Nigeria, Radio/Kaduna	4770do	6090al
0500	0600	vl	Papua New Guinea, Wantok R. Light	7325va	
0500	0600		Russia, Voice of 17635pa	21790pa	
0500	0600	DRM	Russia, Voice of 15735va		
0500	0600		Singapore, MediaCorp Radio 6150do		
0500	0600		Swaziland, TWR 3200af	4775af	9500af
0500	0600	vl	Uganda, Radio 4976do	5026do	
0500	0600	DRM	UK, BBC World Service	7440eu	
0500	0600		UK, BBC World Service	3255af	6005af
			6190af	6195af	7160af 9410eu
			11695af	11760as	11765af 11955as
			12095as	15310as	15360as 15420af
			15565eu	17640af	17760as 17790as
			17885af	21660as	
0500	0600		Ukraine, Radio Ukraine Intl	9945eu	
0500	0600		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb 10320usb
			12133usb	13362usb	
0500	0600		USA, KAIJ Dallas TX	5755va	
0500	0600		USA, KTBN Salt Lake City UT	7505na	
0500	0600		USA, KWHR Naalehu HI	13650as	
0500	0600		USA, Voice of America	4930af	6080af
			6180af	12080af	15580af
0500	0600		USA, WBCQ Monticello ME	5110am	7415na
0500	0600		USA, WBOH Newport NC	5920am	
0500	0600		USA, WEWN Vandiver AL	5850na	
0500	0600		USA, WHRA Greenbush ME	6145na	
0500	0600	Sat/Sun	USA, WHRI Cypress Creek SC		7315am
0500	0600		USA, WMLK Bethel PA	9265va	
0500	0600		USA, WRMI Miami FL	9955va	
0500	0600		USA, WTJC Newport NC	9370na	
0500	0600		USA, WWCR Nashville TN	3215na	5070na
			5890na	5935na	
0500	0600		USA, WWRB Manchester TN	3185va	
0500	0600		USA, WYFR/Family Radio FL	6855na	9355va
0500	0600		Uzbekistan, CVC International		13680as
0500	0600		Zambia, CVC International	9430af	
0505	0520	m	Austria, Radio Austria Intl	17870me	
0505	0530	Sat/Sun	Austria, Radio Austria Intl	17870me	
0515	0530	vl	Rwanda, Radio 6055do		
0530	0556		Romania, Radio Romania Intl 9655va		11830va
			15435va	17770va	
0530	0600	vl	Rwanda, Radio 6055do		
0530	0600		Thailand, Radio 17655eu		
0535	0600	Sat/Sun	Austria, Radio Austria Intl	17870me	
0545	0600	twhf	Austria, Radio Austria Intl	17870me	

0600 UTC - 2AM EDT / 1AM CDT / 11PM PDT

0600	0603		Croatia, Croatian Radio	6165eu	9470eu
			11610eu		
0600	0615	Sat/Sun	South Africa, TWR 11640af		
0600	0630		Australia, Radio Australia	9660as	12080as
			13670as	15160as	15240pa 15515as
			17750as		
0600	0630	mtwhf	France, Radio France Intl	9765af	11725af
0600	0630		Germany, Deutsche Welle	7310af	15275af
0600	0630		Nigeria, Radio, Natl Svc/Abuja		7275do
0600	0630	mtwhf	UK, Sudan Radio Service	15440af	15505af
0600	0645	mtwhf	South Africa, TWR 11640af		
0600	0655		South Africa, Channel Africa	15255af	
0600	0658		New Zealand, Radio NZ Intl	9615pa	
0600	0658	DRM	New Zealand, Radio NZ Intl	9890pa	
0600	0700		Anguilla, University Network	6090am	
0600	0700		Armenia, CVC International	15515as	
0600	0700		Australia, ABC NT Alice Springs		2310do
			4835do		
0600	0700		Australia, ABC NT Katherine	5025do	
0600	0700		Australia, ABC NT Tennant Creek		4910do
0600	0700		Australia, CVC International	15335as	
0600	0700		Canada, CFRX Toronto ON	6070na	
0600	0700		Canada, CFVP Calgary AB	6030na	

Start	Stop	Days	Station	Frequencies
0600	0700		Canada, CKZN St John's NF	6160na
0600	0700		Canada, CKZU Vancouver BC	6160na
0600	0700		China, China Radio Intl	11710af 11870na 11880as 13660as 15140as 15350as 15465as 17505as 17505as 17540as 17710as
0600	0700		Costa Rica, University Network	5030va 6150va 7375va 9725va 11870va
0600	0700		Cuba, Radio Havana	6000va 6060va 6180na 9550va 9600va 11760va
0600	0700		Germany, CVC Intl/Voice Africa	15640af
0600	0700	mwhfas	Greece, Voice of	11645eu
0600	0700		Guyana, Voice of	3291do
0600	0700		Japan, Radio Japan/NHK World	7230eu 11740as 11760as 13630va 15195pa 17870pa 21755pa
0600	0700		Kuwait, Radio Kuwait	15110as
0600	0700	vl	Liberia, ELWA	4760do
0600	0700		Malaysia, RTM/Trax FM	7295as
0600	0700		Malaysia, RTM/Voice of Malaysia	6175as 9750as 15295as
0600	0700		Nigeria, Radio/Kaduna	4770do 6090al
0600	0700	vl	Papua New Guinea, Wantok R. Light	7325va
0600	0700		Russia, Voice of	17635pa 21790pa
0600	0700		Singapore, MediaCorp Radio	6150do
0600	0700	vl	Solomon Islands, SIBC	5020va 9545al
0600	0700		Swaziland, TWR	3200af 4775af 9500af
0600	0700	Sat/Sun	UK, BBC World Service	17885af
0600	0700		UK, BBC World Service	3255af 6005af 6190af 7475eu 7475al 9410eu 9860as 11695as 11760af 11765as 11955af 12095as 15310as 15360af 15400af 17640as 11760as 17790af 21660af
0600	0700	DRM	UK, BBC World Service	7440eu
0600	0700		USA, American Forces Radio	4319usb 5446usb 5765usb 6350usb 7811usb 10320usb 12133usb 13362usb
0600	0700		USA, KAIJ Dallas TX	5755va
0600	0700		USA, KTBN Salt Lake City UT	7505na
0600	0700		USA, KWHR Naalehu HI	13650as
0600	0700		USA, Voice of America	6080af 6180af 12080af 15580af
0600	0700		USA, WBCQ Monticello ME	5110am 7415na
0600	0700		USA, WBOH Newport NC	5920am
0600	0700		USA, WEWN Vandiver AL	5850na 7570eu
0600	0700		USA, WHRA Greenbush ME	7490eu
0600	0700		USA, WHRI Cypress Creek SC	7335am 7365am 7490am
0600	0700		USA, WMLK Bethel PA	9265va
0600	0700		USA, WRMI Miami FL	9955va
0600	0700		USA, WTJC Newport NC	9370na
0600	0700		USA, WWCR Nashville TN	3215na 5070na 5890na 5935na
0600	0700		USA, WWRB Manchester TN	3185va
0600	0700		USA, WYFR/Family Radio FL	6000am 7780va 9680na 11530af 11580va
0600	0700	vl	Vanuatu, Radio	4960do
0600	0700		Yemen, Rep of Yemen Radio	9780me
0600	0700		Zambia, CVC International	13650af
0630	0700		Australia, Radio Australia	9660as 12080as 13670as 15160as 15240pa 15415as 15515as 17750va
0630	0700		Bulgaria, Radio	9600eu 11600eu
0630	0700		UK, BBC World Service	11990af
0630	0700	mtwhf	UK, Sudan Radio Service	11945af
0630	0700	mwf	UK, Sudan Radio Service	15445af
0630	645	mtwhfa	Vatican City, Vatican Radio	4005va 6185eu 7250eu 9645eu 11625eu 11740eu 13765eu 15570af 15595af
0645	0700	Sun	Albania, TWR Europe	11865eu
0645	0700	Sun	Monaco, TWR Europe	9800eu
0659	0700	DRM	New Zealand, Radio NZ Intl	7145pa

0700 UTC - 3AM EDT / 2AM CDT / 12AM PDT

Start	Stop	Days	Station	Frequencies
0700	0705		UK, BBC World Service	6005af
0700	0727		Czech Rep, Radio Prague	9880eu 11600eu
0700	0727		Slovakia, Radio Slovakia Int	9440pa 15460pa
0700	0730		France, Radio France Intl	13675af
0700	0745		USA, WYFR/Family Radio FL	7780va
0700	0750	mtwhfs	Albania, TWR Europe	11865eu
0700	0750	mtwhf	Monaco, TWR Europe	9800eu
0700	0800		Anguilla, University Network	6090am
0700	0800		Australia, ABC NT Alice Springs	2310do 4835do
0700	0800		Australia, ABC NT Katherine	5025do
0700	0800		Australia, ABC NT Tennant Creek	4910do
0700	0800		Australia, CVC International	15335as
0700	0800		Australia, Radio Australia	9660as 9710as 12080as 13630as 15160pa 15240pa 15415as 17750va
0700	0800		Canada, CFRX Toronto ON	6070na
0700	0800		Canada, CFVP Calgary AB	6030na
0700	0800		Canada, CKZN St John's NF	6160na
0700	0800		Canada, CKZU Vancouver BC	6160na
0700	0800		China, China Radio Intl	11880as 13660as 13710as 15450as 15465eu 17490eu 17540as 17710as
0700	0800		Costa Rica, University Network	5030va 6150va 7375va 9725va 11870va
0700	0800		Germany, CVC Intl/Voice Africa	15640af
0700	0800		Guyana, Voice of	3291do 5950do
0700	0800		Kuwait, Radio Kuwait	15110as
0700	0800	vl	Liberia, ELWA	4760do
0700	0800		Liberia, Star Radio	9525af
0700	0800		Malaysia, RTM/Trax FM	7295as
0700	0800		Malaysia, RTM/Voice of Malaysia	6175as 9750as 15295as
0700	0800		Myanmar, Radio	9730do
0700	0800		New Zealand, Radio NZ Intl	6095pa
0700	0800		New Zealand, Radio NZ Intl	6095pa
0700	0800	DRM	New Zealand, Radio NZ Intl	7145pa
0700	0800		Nigeria, Radio/Kaduna	4770do 6090al
0700	0800	vl	Papua New Guinea, Wantok R. Light	7325va
0700	0800		Russia, Voice of	17495pa 17635pa 21790pa
0700	0800		Singapore, MediaCorp Radio	6150do
0700	0800	vl	Solomon Islands, SIBC	5020do 9545al
0700	0800		Swaziland, TWR	4775af 6120af 9500af
0700	0800		Taiwan, Radio Taiwan Intl	5950am
0700	0800	DRM	UK, BBC World Service	9470eu
0700	0800		UK, BBC World Service	6190eu 7320eu 9470eu 9860af 11695as 11760me 11765af 11955as 12095af 15310as 15360as 15400af 15575as 17760as 17830af 21660as
0700	0800	Sat/Sun	UK, BBC World Service	17885af
0700	0800		UK, Bible Voice BC	5945eu
0700	0800	fas	Ukraine, Radio Ukraine Intl	9945eu
0700	0800		USA, American Forces Radio	4319usb 5446usb 5765usb 6350usb 7811usb 10320usb 12133usb 13362usb
0700	0800		USA, KAIJ Dallas TX	5755va
0700	0800		USA, KTBN Salt Lake City UT	7505na
0700	0800		USA, KWHR Naalehu HI	13650as
0700	0800		USA, WBCQ Monticello ME	5110am 7415na
0700	0800		USA, WBOH Newport NC	5920am
0700	0800		USA, WEWN Vandiver AL	5850na 7570eu
0700	0800		USA, WHRI Cypress Creek SC	7335am 7365am
0700	0800		USA, WMLK Bethel PA	9265va
0700	0800		USA, WRMI Miami FL	9955va
0700	0800		USA, WTJC Newport NC	9370na
0700	0800		USA, WWCR Nashville TN	3215na 5070na 5890na 5935na
0700	0800		USA, WWRB Manchester TN	3185va
0700	0800		USA, WYFR/Family Radio FL	5985na 6855na 9505am 9715am 9930af
0700	0800	vl	Vanuatu, Radio	4960do
0700	0800		Zambia, CVC International	13650af
0715	0750	Sat	Albania, TWR Europe	11865eu
0715	0750	Sat	Monaco, TWR Europe	9800eu
0730	0800		Australia, HCJB Global	11750pa
0730	0800		Pakistan, Radio	15100eu 17835eu

0800 UTC - 4AM EDT / 3AM CDT / 1AM PDT

Start	Stop	Days	Station	Frequencies
0800	0900		USA, WWRB Manchester TN	3185va
0800	0815	Sat	UK, Bible Voice BC	5945eu
0800	0820	mtwhfs	Albania, TWR Europe	11865eu
0800	0820	mtwhfs	Monaco, TWR Europe	9800eu
0800	0825		Malaysia, RTM/Voice of Malaysia	6175as 9750as 15295as
0800	0830		Australia, ABC NT Katherine	5025do
0800	0830		Australia, ABC NT Tennant Creek	4910do
0800	0830		Myanmar, Radio	9730do
0800	0830		Pakistan, Radio	15100eu 17835eu
0800	0845	Sat	Guam, TWR/KTWR	11840pa
0800	0845	Sun	UK, Bible Voice BC	5945eu
0800	0845		USA, WYFR/Family Radio FL	9930af
0800	0900		Anguilla, University Network	6090am
0800	0900		Australia, ABC NT Alice Springs	2310do 4835do
0800	0900		Australia, CVC International	15335as
0800	0900		Australia, HCJB Global	11750pa
0800	0900		Australia, Radio Australia	5995va 9580va 9590va 9710as 12080va 13630as 15415va 17750va
0800	0900		Canada, CFRX Toronto ON	6070na
0800	0900		Canada, CFVP Calgary AB	6030na

Start	Stop	Days	Station	Frequencies
0800	0900		Canada, CKZN St John's NF	6160na
0800	0900		Canada, CKZU Vancouver BC	6160na
0800	0900		China, China Radio Intl	11620as 11880as 13710eu 15350as 15465as 17490eu 17540as
0800	0900		Costa Rica, University Network	5030va 6150va 7375va 9725va 11870va
0800	0900		Germany, CVC Intl/Voice Africa	15640af
0800	0900	vl	Greece, Voice of	9420eu 15630eu
0800	0900	mtwhf	Guam, TWR/KTWR	11840pa
0800	0900		Guyana, Voice of	3291do 5950do
0800	0900		Indonesia, Voice of	9525as 11785pa 15150al
0800	0900	Sat	Latvia, Radio SWH	9290eu
0800	0900	vl	Liberia, ELWA	4760do
0800	0900		Malaysia, RTM/Trax FM	7295as
0800	0900		New Zealand, Radio NZ Intl	6095pa
0800	0900	DRM	New Zealand, Radio NZ Intl	7145pa
0800	0900		Nigeria, Radio/Kaduna	4770do 6090al
0800	0900		Nigeria, Voice of/Ext. Svc Lagos	9690af
0800	0900		Papua New Guinea, NBC	4890do
0800	0900	vl	Papua New Guinea, Wantok R. Light	7325va
0800	0900		Russia, Voice of	17495va 17635va 21790pa
0800	0900	DRM	Russia, Voice of	12060eu 15780eu
0800	0900		Singapore, MediaCorp Radio	6150do
0800	0900	vl	Solomon Islands, SIBC	5020do 9545al
0800	0900		South Africa, Channel Africa	9620af
0800	0900		South Korea, KBS World Radio	9570as
0800	0900		Swaziland, TWR	4775af 6120af 9500af
0800	0900		Taiwan, Radio Taiwan Intl	11715pa
0800	0900	DRM	UK, BBC World Service	9480eu
0800	0900		UK, BBC World Service	6190af 7320eu 9470eu 9740as 9860af 11760me 15310as 15360as 15400af 15485af 17760as 17790as 17830af 17885af 21470af 21660as
0800	0900	Sat/Sun	UK, BBC World Service	6195as 15575as
0800	0900		Ukraine, Radio Ukraine Intl	9945eu
0800	0900		USA, American Forces Radio	4319usb 5446usb 5765usb 6350usb 7811usb 10320usb 12133usb 13362usb
0800	0900		USA, KAIJ Dallas TX	5755va
0800	0900		USA, KNLS Anchor Point AK	7355as
0800	0900		USA, KTBN Salt Lake City UT	7505na
0800	0900		USA, KWHR Naalehu HI	9930as
0800	0900		USA, WBOH Newport NC	5920am
0800	0900		USA, WEWN Vandiver AL	5850na 7570eu
0800	0900		USA, WHRI Cypress Creek SC	7315am 7335am
0800	0900		USA, WMLK Bethel PA	9265va
0800	0900		USA, WRMI Miami FL	9955va
0800	0900		USA, WTJC Newport NC	9370na
0800	0900		USA, WWCR Nashville TN	3215na 5070na 5890na 5935na
0800	0900		USA, WYFR/Family Radio FL	5985na 6855na
0800	0900	vl	Vanuatu, Radio	4960do
0800	0900		Zambia, CVC International	13650af
0805	0900	mtwhf	Guam, TWR/KTWR	15170as
0815	0845	Sat	UK, Bible Voice BC	9655eu
0830	0900		Australia, ABC NT Katherine	2485do
0830	0900		Australia, ABC NT Tennant Creek	2325do
0830	0900		Lithuania, Radio Vilnius	9710eu

0900 UTC - 5AM EDT / 4AM CDT / 2AM PDT

Start	Stop	Days	Station	Frequencies
0900	0900		USA, WBCQ Monticello ME	5110am 7415na
0900	0927		Czech Rep, Radio Prague	9800eu 21745as
0900	0930		Australia, HCJB Global	11750pa
0900	1000		Anguilla, University Network	6090am
0900	1000		Australia, ABC NT Alice Springs	2310do 4835do
0900	1000		Australia, ABC NT Katherine	2485do
0900	1000		Australia, ABC NT Tennant Creek	2325do
0900	1000		Australia, CVC International	11955as
0900	1000		Australia, Radio Australia	9580va 9590va 15415as
0900	1000		Bhutan, BBS	6035as
0900	1000		Canada, CFRX Toronto ON	6070na
0900	1000		Canada, CFVP Calgary AB	6030na
0900	1000		Canada, CKZN St John's NF	6160na
0900	1000		Canada, CKZU Vancouver BC	6160na
0900	1000		China, China Radio Intl	11620as 15210pa 15350as 17490eu 17690pa 17750as
0900	1000		Costa Rica, University Network	5030va 6150va 7375va 9725va 11870va 13750va
0900	1000		Germany, Deutsche Welle	15340as 17770as
0900	1000	vl/Sun	Greece, Voice of	9420eu 15630eu
0900	1000		Guyana, Voice of	3291do 5950do
0900	1000	vl	Liberia, ELWA	4760do
0900	1000		Malaysia, RTM/Trax FM	7295as
0900	1000		New Zealand, Radio NZ Intl	6095pa
0900	1000	DRM	New Zealand, Radio NZ Intl	7145pa
0900	1000		Nigeria, Radio/Kaduna	4770do 6090al
0900	1000		Nigeria, Voice of/ Ext. Svc Lagos	9690af
0900	1000		Papua New Guinea, NBC	4890do
0900	1000	vl	Papua New Guinea, Wantok R. Light	7325va
0900	1000		Saudi Arabia, BSKSA	15250af
0900	1000		Singapore, MediaCorp Radio	6150do
0900	1000	vl	Solomon Islands, SIBC	5020do 9545al
0900	1000		South Africa, Channel Africa	9620af
0900	1000	DRM	UK, BBC World Service	9480eu
0900	1000	smtwhf	UK, BBC World Service	9605as
0900	1000		UK, BBC World Service	6190af 6195as 7320eu 9470eu 9740eu 9860af 11760me 15310as 15360as 15400af 15575as 17760as 17830af 17885af 21470af
0900	1000		USA, American Forces Radio	4319usb 5446usb 5765usb 6350usb 7811usb 10320usb 12133usb 13362usb
0900	1000		USA, KAIJ Dallas TX	5755va
0900	1000		USA, KTBN Salt Lake City UT	7505na
0900	1000		USA, KWHR Naalehu HI	9930as
0900	1000		USA, WBCQ Monticello ME	5110am 7415na
0900	1000		USA, WBOH Newport NC	5920am
0900	1000		USA, WEWN Vandiver AL	5850na
0900	1000		USA, WHRI Cypress Creek SC	7315am 7335am
0900	1000		USA, WRMI Miami FL	9955va
0900	1000		USA, WTJC Newport NC	9370na
0900	1000		USA, WWCR Nashville TN	5070na 5890na 5935na 9985na
0900	1000		USA, WWRB Manchester TN	3185va
0900	1000		USA, WYFR/Family Radio FL	5985na 6885na 9450va 9755am
0900	1000	vl	Vanuatu, Radio	4960do
0900	1000		Zambia, CVC International	13650af
0930	0945		Israel, Kol Israel	13855eu 15760eu
0930	1000	Sun	Italy, IRRS	9510eu

1000 UTC - 6AM EDT / 5AM CDT / 3AM PDT

Start	Stop	Days	Station	Frequencies
1000	1003	mtwhf	Croatia, Croatian Radio	9830pa
1000	1030		Mongolia, Voice of	12085va
1000	1030		UK, BBC World Service	9605as 21660as
1000	1058		New Zealand, Radio NZ Intl	6095pa
1000	1100		Anguilla, University Network	11775am
1000	1100		Australia, ABC NT Alice Springs	2310do 4835do
1000	1100		Australia, ABC NT Katherine	2485do
1000	1100		Australia, ABC NT Tennant Creek	2325do
1000	1100		Australia, CVC International	11955as
1000	1100	DRM	Australia, CVC International	9760eu
1000	1100		Australia, HCJB Global	15540va
1000	1100		Australia, Radio Australia	9580va 9590va 15415as
1000	1100	DRM	Austria, CVC International	11815eu
1000	1100		Canada, CFRX Toronto ON	6070na
1000	1100		Canada, CFVP Calgary AB	6030na
1000	1100		Canada, CKZN St John's NF	6160na
1000	1100		Canada, CKZU Vancouver BC	6160na
1000	1100		China, China Radio Intl	6040as 11610as 11635as 13590as 13620as 13720as 15190as 15210as 15350eu 17490as 17690as
1000	1100		Costa Rica, University Network	5030va 6150va 7375va 9725va 11870va 13750va
1000	1100		Guyana, Voice of	3291do 5950do
1000	1100		India, All India Radio	7270as 13695va 15020as 15260as 15410as 17510pa 17800as 17895pa
1000	1100	Sun	Italy, IRRS	9510eu
1000	1100		Japan, Radio Japan/NHK World	6120na 9650as 9695as 11730na 11890pa 17585eu
1000	1100	vl	Liberia, ELWA	4760do
1000	1100		Malaysia, RTM/Trax FM	7295as
1000	1100		Netherlands, Radio	13710as 12065as 13820as
1000	1100	DRM	New Zealand, Radio NZ Intl	7145pa
1000	1100		Nigeria, Radio/Kaduna	4770do 6090al
1000	1100		Nigeria, Voice of/ Ext. Svc Lagos	9690af
1000	1100		North Korea, Voice of Korea	11710am 11735as 13650as
1000	1100		Papua New Guinea, NBC	4890do
1000	1100	vl	Papua New Guinea, Wantok R. Light	7325va
1000	1100		Saudi Arabia, BSKSA	15250af
1000	1100		Singapore, MediaCorp Radio	6150do

1000	1100	vl	Solomon Islands, SIBC	5020do	9545al
1000	1100		South Africa, Channel Africa	9620af	
1000	1100		UK, BBC World Service	6190af	6195as
			7320eu	9470eu	9740as	9860af
			11760me	15310as	15575as	17760as
			17790as	17885af	21470af
1000	1100	Sat/Sun	UK, BBC World Service	15400af	
1000	1100		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb
1000	1100		USA, KAIJ Dallas TX	5755va	
1000	1100		USA, KNLS Anchor Point AK	6890as	7355al
1000	1100		USA, KTBN Salt Lake City UT	7505na	
1000	1100		USA, KWHR Naalehu HI	9930as	
1000	1100		USA, WBCQ Monticello ME	5110am	7415na
1000	1100		USA, WBOH Newport NC	5920am	
1000	1100		USA, WEWN Vandiver AL	5850na	
1000	1100		USA, WHRI Cypress Creek SC		7315am
			7335am
1000	1100		USA, WRMI Miami FL	9955va	
1000	1100		USA, WTJC Newport NC	9370na	
1000	1100		USA, WWCR Nashville TN	5070na	5890na
			9985na	15825na
1000	1100		USA, WWRB Manchester TN	3185va	
1000	1100		USA, WYFR/Family Radio FL	5950na	5985na
			6855va	7855am	9450va	9755am
1000	1100		Zambia, CVC International	13590af	
1015	1045	Sun	UK, Bible Voice BC	5910as	
1030	1057		Czech Rep, Radio Prague	9880eu	11665eu
1030	1058		Vietnam, Voice of	7285as	
1030	1100		Iran, Voice of the Islamic Rep	15600as	17660as
1030	1100		UK, BBC World Service	9605as	11945as
			15285as	15360as	21660as
1059	1100		New Zealand, Radio NZ Intl	9870pa	

1100 UTC - 7AM EDT / 6AM CDT / 4AM PDT

1100	1115	Sun	UK, Bible Voice BC	5945as	
1100	1128		Vietnam, Voice of	9840as	7220as	7285as
1100	1130		Australia, HCJB Global	15540va	
1100	1130		Iran, Voice of the Islamic Rep	15600as	17600as
1100	1145		USA, WYFR/Family Radio FL	9550am	9755am
1100	1158	DRM	New Zealand, Radio NZ Intl	7145pa	
1100	1200		Anguilla, University Network	11775am	
1100	1200		Australia, ABC NT Alice Springs		2310do
			4835do
1100	1200		Australia, ABC NT Katherine	2485do	
1100	1200		Australia, ABC NT Tennant Creek		2325do
1100	1200		Australia, CVC International	13635as	
1100	1200	DRM	Australia, Radio Australia	12080va	
1100	1200		Australia, Radio Australia	5995va	6020va
			9475as	9560pa	9580va	9590va
			12080as
1100	1200	Sat/Sun	Canada, CBC NQ SW Service	9625na	
1100	1200		Canada, CFRX Toronto ON	6070na	
1100	1200		Canada, CFVP Calgary AB	6030na	
1100	1200		Canada, CKZN St John's NF	6160na	
1100	1200		Canada, CKZU Vancouver BC		6160na
1100	1200		China, China Radio Intl	5955as	6040na
			11650as	11750na	11795as	13590as
			13645as	13650na	13720as	17490eu
1100	1200		Costa Rica, University Network		5030va
			6150va	7375va	9725va	11870va
			13750va
1100	1200	Sun	Italy, IRRS	9510eu	
1100	1200		Japan, Radio Japan/NHK World		6120na
			9695as	11730as
1100	1200	vl	Liberia, ELWA	4760do	
1100	1200		Malaysia, RTM/Trax FM	7295as	
1100	1200		Netherlands, Radio	11675na	
1100	1200		New Zealand, Radio NZ Intl	9870pa	
1100	1200		Nigeria, Radio/Kaduna	4770do	6090al
1100	1200		Nigeria, Voice of/ Ext. Svc Lagos		9690af
1100	1200		Papua New Guinea, NBC	4890do	
1100	1200	vl	Papua New Guinea, Wantok R. Light	7325va	
1100	1200		Saudi Arabia, BSKSA	15250af	
1100	1200		Singapore, Radio Singapore Intl		6080as
			6150as
1100	1200		South Africa, Channel Africa	9620af	
1100	1200		Taiwan, Radio Taiwan Intl	11715as	
1100	1200	Sat/Sun	UK, BBC World Service	9660am	15400af
			15575as
1100	1200		UK, BBC World Service	6190af	6195as
			7320eu	9465sa	9470eu	9740as
			9860va	11760me	15310as	17760as
			17790as	17885af	21470af
1100	1200	mtwhf	UK, BBC World Service	15575as	17830af
1100	1200	Sat	UK, Bible Voice BC	5945as	
1100	1200		Ukraine, Radio Ukraine Intl	11550eu	
1100	1200		USA, American Forces Radio	4319usb	5446usb

			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb
1100	1200		USA, KAIJ Dallas TX	5755va	
1100	1200		USA, KTBN Salt Lake City UT	7505na	
1100	1200		USA, KWHR Naalehu HI	9930as	
1100	1200		USA, WBOH Newport NC	5920am	
1100	1200		USA, WEWN Vandiver AL	5850na	
1100	1200		USA, WINB Red Lion PA	9265am	
1100	1200		USA, WRMI Miami FL	9955va	
1100	1200		USA, WTJC Newport NC	9370na	
1100	1200		USA, WWCR Nashville TN	5070na	5890na
			9985na	15825na
1100	1200		USA, WWRB Manchester TN	3185va	
1100	1200		USA, WYFR/Family Radio FL	5985na	7780am
			9625am
1100	1200		Zambia, CVC International	13590af	
1115	1130	twhf	UK, Bible Voice BC	5945as	
1115	1200	m	UK, Bible Voice BC	5945as	
1130	1145		UK, BBC World Service	7135as	11920as
1130	1200		Australia, HCJB Global	15400va	
1130	1200	mtwhfa	Australia, HCJB Global	15425va	
1130	1200		Bulgaria, Radio	11700eu	15700eu
1130	1200		Guam, AWR/KSDA	15435as	
1130	1200	mtwhf	UK, BBC World Service	9660am	
1130	1200		Vatican City, Vatican Radio	15595va	17765va

1200 UTC - 8AM EDT / 7AM CDT / 5AM PDT

1200	1215	vl	UK, Bible Voice BC	5945as	
1200	1230	Sun	Australia, HCJB Global	15425va	
1200	1230		France, Radio France Intl	21620af	
1200	1230		Germany, AWR Europe	15435as	
1200	1230	DRM	UK, Bible Voice BC	5945eu	
1200	1245		USA, WYFR/Family Radio FL	5950na	5985na
1200	1256		Romania, Radio Romania Intl	11875eu	15220eu
1200	1258		New Zealand, Radio NZ Intl	9870pa	
1200	1259		Canada, Radio Canada Intl	9660as	15170as
1200	1259		Poland, Radio Polonia	9525eu	11805eu
1200	1300		Anguilla, University Network	11775am	
1200	1300		Australia, ABC NT Alice Springs		2310do
			4835do
1200	1300		Australia, ABC NT Katherine	2485do	
1200	1300		Australia, ABC NT Tennant Creek		2325do
1200	1300		Australia, CVC International	13635as	
1200	1300	DRM	Australia, Radio Australia	5995va	
1200	1300		Australia, Radio Australia	5995va	6020va
			9475as	9560pa	9580va	9590va
1200	1300	Sat/Sun	Canada, CBC NQ SW Service	9625na	
1200	1300		Canada, CFRX Toronto ON	6070na	
1200	1300		Canada, CFVP Calgary AB	6030na	
1200	1300		Canada, CKZN St John's NF	6160na	
1200	1300		Canada, CKZU Vancouver BC		6160na
1200	1300		China, China Radio Intl	5955as	9460as
			9730as	9760pa	11650as	11660as
			11690as	11760pa	11980as	13645as
			13650eu	13790eu	17490eu
1200	1300		Costa Rica, University Network		9725va
			11870va	13750va
1200	1300		Malaysia, RTM/Trax FM	7295as	
1200	1300	DRM	New Zealand, Radio NZ Intl	7145pa	
1200	1300		Nigeria, Radio/Kaduna	4770do	6090al
1200	1300		Nigeria, Voice of/ Ext. Svc Lagos		9690af
1200	1300		Papua New Guinea, NBC	4890do	
1200	1300	vl	Papua New Guinea, Wantok R. Light	7325va	
1200	1300		Singapore, Radio Singapore Intl		6080as
			6150as
1200	1300		South Korea, KBS World Radio		9650na
1200	1300		UAE, AWR Africa	15140as	
1200	1300		UK, BBC World Service	6190af	6195as
			7320eu	9465sa	9470eu	9740as
			9660am	9860af	11750as	11760me
			15310as	15575as	17790as	17885af
			21470af
1200	1300	mtwhf	UK, BBC World Service	17830af	
1200	1300		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb	10320usb
			12133usb	13362usb
1200	1300		USA, KAIJ Dallas TX	9480va	
1200	1300		USA, KNLS Anchor Point AK	9780as	9920al
1200	1300		USA, KTBN Salt Lake City UT	7505na	
1200	1300		USA, KWHR Naalehu HI	12130as	
1200	1300		USA, Voice of America	6140va	9645va
			9760va	11860as
1200	1300		USA, WBOH Newport NC	5920am	
1200	1300		USA, WEWN Vandiver AL	5850na	
1200	1300		USA, WHRA Greenbush ME	17650na	
1200	1300		USA, WHRI Cypress Creek SC		9495am
			17650am
1200	1300		USA, WINB Red Lion PA	9265am	
1200	1300		USA, WRMI Miami FL	9955va	

Start	End	Days	Station	Freq1	Freq2
1200	1300		USA, WTJC Newport NC	9370na	
1200	1300		USA, WWCR Nashville TN	5890na	9985na
			13845na	15825na	
1200	1300		USA, WWRB Manchester TN	3185va	
1200	1300		USA, WYFR/Family Radio FL	17555am	17750am
1200	1300		Zambia, CVC International	13590af	
1205	1220	m	Austria, Radio Austria Intl	6155va	13730va
			17715va		
1205	1230	Sat/Sun	Austria, Radio Austria Intl	6155va	13730va
			17715va		
1215	1230	twhf	Austria, Radio Austria Intl	17715va	
1215	1300		Egypt, Radio Cairo	17835as	
1230	1258		Vietnam, Voice of	9840as	12020as
1230	1300		Bangladesh, Bangla Betar	7185as	
1230	1300		Sweden, Radio	13580va	15240na 15735va
1230	1300		Thailand, Radio	9835va	
1230	1300		Turkey, Voice of	13685eu	15450eu
1235	1300	Sat/Sun	Austria, Radio Austria Intl	6155va	13730va
			17715va		
1245	1300	Sat	Australia, HCJB Global	15425va	
1245	1300	twhf	Austria, Radio Austria Intl	6155va	13730va
			17715va		
1245	1300	m	Austria, Radio Austria Intl	17715va	

1300 UTC - 9AM EDT / 8AM CDT / 6AM PDT

Start	End	Days	Station	Freq1	Freq2
1300	1327		Czech Rep, Radio Prague	13580eu	17540as
1300	1328		Serbia, International Radio Serbia	7240eu	
1300	1330	twhfas	Albania, Radio Tirana	13750na	
1300	1330		Egypt, Radio Cairo	17835as	
1300	1330		Germany, Universal Life	15750as	
1300	1330	Sun	Italy, IRRS	15750as	
1300	1330		Turkey, Voice of	13685eu	15450eu
1300	1400		Anguilla, University Network	11775am	
1300	1400		Armenia, CVC International	15615as	
1300	1400		Australia, CVC International	13635as	
1300	1400		Australia, Radio Australia	5995va	6020va
			9560as	9580va	9590va
1300	1400	DRM	Australia, Radio Australia	5995va	
1300	1400	Sat/Sun	Canada, CBC NQ SW Service	9625na	
1300	1400		Canada, CFRX Toronto ON	6070na	
1300	1400		Canada, CFVP Calgary AB	6030na	
1300	1400		Canada, CKZN St John's NF	6160na	
1300	1400		Canada, CKZU Vancouver BC		6160na
1300	1400		China, China Radio Intl	5955na	9570na
			9650as	9730as	9760pa 9765as
			9870as	11660as	11760pa 11980as
			13610eu	13755as	13790eu 15260na
			17625sa		
1300	1400		Costa Rica, University Network		9725va
			11870va	13750va	
1300	1400		Germany, Overcomer Ministries		6110na
1300	1400	vl/Sat	Greece, Voice of	9420eu	15630eu
1300	1400	Sun	Latvia, Radio SWH	9290eu	
1300	1400		Malaysia, RTM/Trax FM	7295as	
1300	1400		New Zealand, Radio NZ Intl	6095pa	
1300	1400		Nigeria, Radio/Kaduna	4770do	6090al
1300	1400		Nigeria, Voice of/ Ext. Svc Lagos	9690af	
1300	1400		North Korea, Voice of Korea	9335na	11710na
			13650na	15180ca	
1300	1400		Papua New Guinea, NBC	4890do	
1300	1400	vl	Papua New Guinea, Wantok R. Light	7325va	
1300	1400		Singapore, Radio Singapore Intl		6080as
			6150as		
1300	1400		South Korea, KBS World Radio		9570na
			9770as		
1300	1400		UK, BBC World Service	6190af	6195as
			7320eu	9740as	9860af 11750as
			11760me	15310as	15420af 17790as
			17885af	21470af	
1300	1400	Sat/Sun	UK, BBC World Service	15575as	
1300	1400	mtwhf	UK, BBC World Service	17830af	
1300	1400		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb 10320usb
			12133usb	13362usb	
1300	1400		USA, KAIJ Dallas TX	9480va	
1300	1400		USA, KJES Vado NM	11715na	
1300	1400		USA, KTBN Salt Lake City UT	7505na	
1300	1400		USA, KWHR Naalehu HI	12130as	
1300	1400		USA, Voice of America	9645va	9760va
1300	1400	w f	USA, WBCQ Monticello ME	9330am	
1300	1400		USA, WBOH Newport NC	5920am	
1300	1400		USA, WEWN Vandiver AL	5850na	
1300	1400		USA, WHRA Greenbush ME	17650na	
1300	1400	mtwhf	USA, WHRI Cypress Creek SC		9495am
1300	1400		USA, WHRI Cypress Creek SC		17650am
1300	1400		USA, WINB Red Lion PA	13570am	
1300	1400		USA, WRMI Miami FL	9955va	
1300	1400		USA, WTJC Newport NC	9370na	
1300	1400		USA, WWCR Nashville TN	5890na	9985na

Start	End	Days	Station	Freq1	Freq2
			13845na	15825na	
1300	1400		USA, WWRB Manchester TN	9385na	
1300	1400		USA, WYFR/Family Radio FL	11830na	11865na
			11895na	11910na	17750na
1300	1400		Zambia, CVC International	13590af	
1330	1357	DRM/f-a	Czech Rep, Radio Prague	9850eu	
1330	1400	DRM	Canada, Radio Canada Intl	7240eu	
1330	1400	twhfa	Guam, AWR/KSDA	15275as	
1330	1400		India, All India Radio	9690as	11620as
			13710as		
1330	1400		Laos, National Radio	7145as	
1330	1400		Sweden, Radio	15240na	15735va
1330	1400		UK, BBC World Service	7465eu	
1345	1400		Guam, TWR/KTWR	9975as	

1400 UTC - 10AM EDT / 9AM CDT / 7AM PDT

Start	End	Days	Station	Freq1	Freq2
1400	1415	t h	Germany, Pan American BC	13645me	
1400	1415	twf	Russia, FEBA	9500eu	
1400	1430		Australia, Radio Australia	5995va	6080va
			7240as	9590va	
1400	1430	fa	Guam, TWR/KTWR	9975as	
1400	1430	DRM	Romania, Radio Romania Intl	9600eu	
1400	1430		Thailand, Radio	9805va	
1400	1430	tha	UK, Sudan Radio Service	15470af	
1400	1500		Anguilla, University Network	11775am	
1400	1500		Armenia, CVC International	15615as	
1400	1500		Australia, CVC International	13635as	
1400	1500		Bhutan, BBS	6035as	
1400	1500	Sat/Sun	Canada, CBC NQ SW Service	9625na	
1400	1500		Canada, CFRX Toronto ON	6070na	
1400	1500		Canada, CFVP Calgary AB	6030na	
1400	1500		Canada, CKZN St John's NF	6160na	
1400	1500		Canada, CKZU Vancouver BC		6160na
1400	1500		China, China Radio Intl	5955as	9560as
			9765as	9870eu	11675as 11765as
			11775as	13610eu	13710eu 13740na
			13790eu		
1400	1500		Costa Rica, University Network		9725va
			11870va	13750va	
1400	1500	Sat	Germany, Overcomer Ministries	17810eu	
1400	1500		Germany, Overcomer Ministries	6110eu	
			13810va		
1400	1500	mtw	Guam, TWR/KTWR	9975as	
1400	1500		India, All India Radio	9690as	11620as
			13710as		
1400	1500	Sun	Italy, IRRS	6125eu	
1400	1500		Japan, Radio Japan/NHK World		7200as
			11730as	11840pa	
1400	1500		Jordan, Radio	11690na	
1400	1500		Libya, Voice of Africa	17775af	17870af
			21695af	21870af	
1400	1500		Malaysia, RTM/Trax FM	7295as	
1400	1500		Netherlands, Radio	9345as	9840as
			11835as		
1400	1500		New Zealand, Radio NZ Intl	6095pa	
1400	1500		Nigeria, Radio/Kaduna	4770do	6090al
1400	1500		Nigeria, Voice of/ Ext. Svc Lagos	9690af	
1400	1500	vl	Papua New Guinea, Wantok R. Light	7325va	
1400	1500		Russia, Voice of	6045as	7165as 9745as
			11755as	15695as	15660as
1400	1500	DRM	Russia, Voice of	9450eu	
1400	1500		Singapore, MediaCorp Radio	6150do	
1400	1500		South Africa, Channel Africa	9620af	
1400	1500		Taiwan, Radio Taiwan Intl	15265as	
1400	1500	Sat	UK, BBC World Service	12095af	
1400	1500	mtwhf	UK, BBC World Service	17830af	
1400	1500		UK, BBC World Service	3255af	6190af
			6195as	7320eu	9740as 9860af
			11750as	11920as	15310as 15575as
			21470af	21660af	
1400	1500	Sat/Sun	UK, Bible Voice BC	15680as	
1400	1500		Ukraine, Radio Ukraine Intl	7530eu	
1400	1500		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb 10320usb
			12133usb	13362usb	
1400	1500		USA, KAIJ Dallas TX	9480va	
1400	1500		USA, KJES Vado NM	11715na	
1400	1500		USA, KNLS Anchor Point AK	7355as	
1400	1500		USA, KTBN Salt Lake City UT	7505na	15590na
1400	1500		USA, KWHR Naalehu HI	9930as	
1400	1500		USA, Voice of America	4930af	6080af
			7125va	9760va	13570af 15185va
			15530va		
1400	1500		USA, WBCQ Monticello ME	9330am	
1400	1500		USA, WBOH Newport NC	5920am	
1400	1500		USA, WEWN Vandiver AL	9955na	
1400	1500		USA, WHRA Greenbush ME	17650na	
1400	1500		USA, WHRI Cypress Creek SC		9840am
			11785am	17650am	

1400	1500		USA, WINB Red Lion PA	13570am	
1400	1500		USA, WRMI Miami FL	7385na	
1400	1500		USA, WTJC Newport NC	9370na	
1400	1500		USA, WWCR Nashville TN	9985na	12160na
			13845na	15825na	
1400	1500		USA, WWRB Manchester TN	9385na	
1400	1500		USA, WYFR/Family Radio FL	7320va	9865eu
			11830na	11910na	12150eu 13695am
			17750am		
1400	1500		Zambia, CVC International	13590af	
1415	1430		Nepal, Radio	3230as	5005as 6100as
			7165as		
1415	1445	m	UAE, FEBA	12025eu	
1430	1445	Sun	Germany, Pan American BC	13645as	13820as
1430	1445	twf	UAE, FEBA	12025eu	
1430	1500		Australia, Radio Australia	5995va	6080va
			7240as	9475as	9590va 11660pa
1430	1500		Myanmar, Radio	5986as	
1430	1500	DRM	South Korea, KBS World Radio	9770eu	

1500 UTC - 11AM EDT / 10AM CDT / 8AM PDT

1500	1510	mtwhfa	Turkmenistan, Turkmen Radio	5015eu	
1500	1528		Vietnam, Voice of	9550va	9840va 12020va
			13860va		
1500	1530	vl	Eritrea, Bana Radio	5100do	
1500	1530		Guam, AWR/KSDA	11640as	
1500	1530		Nigeria, Radio, Natl Svc/Abuja		7275do
1500	1530		UK, BBC World Service	9695af	11860af
			15420af		
1500	1530	ta	UK, Bible Voice BC	13840as	
1500	1545		Sweden, IBRA Radio	7340as	
1500	1545		USA, WYFR/Family Radio FL	15790am	
1500	1550		New Zealand, Radio NZ Intl	6095pa	
1500	1555		South Africa, Channel Africa	17770af	
1500	1557		Canada, Radio Canada Intl	11675as	17720as
1500	1559		Germany, Overcomer Ministries		17815na
1500	1559		Libya, Voice of Africa	17775af	17870af
			21695af	21870af	
1500	1559		South Africa, Channel Africa	9620af	
1500	1600		Anguilla, University Network	11775am	
1500	1600		Armenia, CVC International	15615as	
1500	1600		Australia, CVC International	13635as	
1500	1600		Australia, Radio Australia	5995va	6080va
			7240as	9475as	9590va 11660pa
1500	1600	Sat/Sun	Canada, CBC NQ SW Service	9625na	
1500	1600		Canada, CFRX Toronto ON	6070na	
1500	1600		Canada, CFVP Calgary AB	6030na	
1500	1600		Canada, CKZN St John's NF	6160na	
1500	1600		Canada, CKZU Vancouver BC		6160na
1500	1600		China, China Radio Intl	5955as	6100as
			7160as	7325eu	9785as 9870as
			11755as	11965eu	13640eu 13685af
			13740na	17630af	
1500	1600		Costa Rica, University Network		9725va
			11870va	13750va	
1500	1600		Germany, CVC Intl/Voice Africa		15715af
1500	1600		Japan, Radio Japan/NHK World	6190as	
			7200as	9505va	9525na 11730as
1500	1600		Jordan, Radio	11690na	
1500	1600		Malaysia, RTM/Trax FM	7295as	
1500	1600		Netherlands, Radio	9345as	9890as
			11835as		
1500	1600		Nigeria, Radio/Kaduna	4770do	6090al
1500	1600		Nigeria, Voice of/ Ext. Svc Lagos	9690af	
1500	1600		North Korea, Voice of Korea	9335na	11710na
			13760eu	15245eu	
1500	1600	vl	Papua New Guinea, Wantok R. Light	7325va	
1500	1600		Russia, Voice of	4965me	4975me 7370eu
			9625as	9660as	11985me 12040eu
1500	1600		Singapore, MediaCorp Radio	6150do	
1500	1600		UAE, AWR Africa	11670as	
1500	1600	Sat	UK, BBC World Service	12095af	
1500	1600	mtwhf	UK, BBC World Service	17830af	
1500	1600		UK, BBC World Service	3255af	5975as
			6190af	6195as	7320af 9740as
			9860af	11750as	11760as 11920as
			15310as	15400af	15485af 21470af
			21660af		
1500	1600		USA, American Forces Radio	4319usb	5446usb
			5765usb	6350usb	7811usb 10320usb
			12133usb	13362usb	
1500	1600		USA, KAIJ Dallas TX	9480va	
1500	1600		USA, KTBN Salt Lake City UT	7505va	15590na
1500	1600		USA, KWHR Naalehu HI	9930as	
1500	1600		USA, Voice of America	4930af	6080af
			9590va	7125va	9590va 9760va
			12080va	13735va	15105va 15445va
			15580af	17895af	
1500	1600		USA, WBCQ Monticello ME	9330am	
1500	1600		USA, WBOH Newport NC	5920am	
1500	1600		USA, WEWN Vandiver AL	9955na	
1500	1600		USA, WHRA Greenbush ME	17650af	
1500	1600		USA, WHRI Cypress Creek SC		9840am
			11785am		
1500	1600	Sun	USA, WHRI Cypress Creek SC		15355am
1500	1600	mtwhfa	USA, WHRI Cypress Creek SC		17650am
1500	1600		USA, WINB Red Lion PA	13570am	
1500	1600		USA, WRMI Miami FL	7385na	
1500	1600		USA, WTJC Newport NC	9370na	
1500	1600		USA, WWCR Nashville TN	9985na	12160na
			13845na	15825na	
1500	1600		USA, WWRB Manchester TN	9385na	
1500	1600		USA, WYFR/Family Radio FL	7320va	11830na
			11910na	11750na	
1500	1600		Zambia, CVC International	15715af	
1505	1520	m	Austria, Radio Austria Intl	13775ca	
1505	1530	Sat/Sun	Austria, Radio Austria Intl	13775ca	
1505	1600	DRM	Canada, Radio Canada Intl	9800ca	
1505	1600		Canada, Radio Canada Intl	9515na	
1510	1545		Swaziland, TWR	4760af	
1515	1530	twhf	Austria, Radio Austria Intl	13775ca	
1515	1600	Sat	UK, Bible Voice BC	15680as	
1530	1545		India, All India Radio	7255as	9910as
1530	1550		Vatican City, Vatican Radio	12065va	13765va
			15235va		
1530	1600		Germany, AWR Europe	15225as	
1530	1600		Iran, Voice of the Islamic Rep	7370as	9635as
1530	1600	Sun	UK, Bible Voice BC	13590me	
1530	1600	m	UK, Bible Voice BC	15680as	
1535	1600	Sat/Sun	Austria, Radio Austria Intl	13775ca	
1540	1600	mtwhf	UK, Bible Voice BC	13590me	
1545	1600	m	Austria, Radio Austria Intl	13775ca	
1545	1600	twhfa	Austria, Radio Austria Intl	13775ca	
1545	1600	Sun	Germany, Pan American BC	13820as	
1545	1600	Sat	UK, Bible Voice BC	13590me	
1551	1600		New Zealand, Radio NZ Intl	7145pa	
1551	1600	DRM	New Zealand, Radio NZ Intl	6095pa	

1600 UTC - 12PM EDT / 11AM CDT / 9AM PDT

1600	1605	DRM	Canada, Radio Canada Intl	9800na	
1600	1605	Sun	Croatia, Croatian Radio	6165eu	
1600	1615	mtwhfa	Croatia, Croatian Radio	6165eu	
1600	1615		Pakistan, Radio	9380va	11550af 11570va
1600	1615	twhf	UK, Bible Voice BC	13590me	
1600	1620	mtwh	Moldova, Radio DMR Pridnestrovye		5965eu
1600	1627		Czech Rep, Radio Prague	5930eu	17485af
1600	1630	vl	Eritrea, Bana Radio	5100do	
1600	1630	h	Germany, Pan American BC	13820me	
1600	1630		Guam, AWR/KSDA	11640as	11805as
1600	1630		Iran, Voice of the Islamic Rep	7370as	7330as
1600	1630		Myanmar, Radio	9730do	
1600	1630		Nigeria, Voice of/ Ext. Svc Lagos		9690af
1600	1630	Sat/Sun	Swaziland, TWR	4760af	
1600	1630		UK, Bible Voice BC	13590me	
1600	1640	f	Moldova, Radio DMR Pridnestrovye		5965eu
1600	1645		USA, WYFR/Family Radio FL	11830na	11865na
			17750am		
1600	1700		Anguilla, University Network	11775am	
1600	1700		Australia, CVC International	13635as	
1600	1700		Australia, Radio Australia	5995va	6080va
			7240as	9475as	9710va 11660pa
1600	1700	Sat	Canada, CBC NQ SW Service	9625na	
1600	1700		Canada, CFRX Toronto ON	6070na	
1600	1700		Canada, CFVP Calgary AB	6030na	
1600	1700		Canada, CKZN St John's NF	6160na	
1600	1700		Canada, CKZU Vancouver BC		6160na
1600	1700		Canada, Radio Canada Intl	9515na	
1600	1700		China, China Radio Intl	6100af	9570af
			11900eu	11940eu	11965eu 13760eu
1600	1700		Costa Rica, University Network		11870va
			13750va		
1600	1700		Egypt, Radio Cairo	11740af	
1600	1700		Ethiopia, Radio	7165af	9560af
1600	1700		France, Radio France Intl	15160af	15605af
			17605af		
1600	1700		Germany, CVC Intl/Voice Africa		15715af
1600	1700		Germany, Deutsche Welle	6170as	9485as
			15640as		
1600	1700	Sun	Germany, Overcomer Ministries		17815na
1600	1700		Germany, Universal Life	7285va	
1600	1700	fs	Italy, IRRS	7285eu	
1600	1700		Jordan, Radio	11690na	
1600	1700		Malaysia, RTM/Trax FM	7295as	
1600	1700	DRM	New Zealand, Radio NZ Intl	6095pa	
1600	1700		New Zealand, Radio NZ Intl	7145pa	
1600	1700		Nigeria, Radio/Kaduna	4770do	6090al
1600	1700		North Korea, Voice of Korea	9990va	11545va
1600	1700	vl	Papua New Guinea, Wantok R. Light	7325va	

Start	Stop	Days	Station				
1600	1700		Russia, Voice of	6070as	7350as	7370eu	
				9405as	9890eu	11985va	12055va
				12115va			
1600	1700	vl	Rwanda, Radio	6055do			
1600	1700		South Korea, KBS World Radio			9515eu	
1600	1700		Taiwan, Radio Taiwan Intl	11550as	15515as		
1600	1700		UK, BBC World Service	3915as	5975as		
				6190af	6195as	7320eu	9510as
				11760as	11920as	15400af	15485af
				17840af	21470af	21660af	
1600	1700	DRM	UK, BBC World Service	7465eu			
1600	1700	mtwhf	UK, BBC World Service	17830af			
1600	1700	Sat/Sun	UK, BBC World Service	9695af	11860af		
				12095af			
1600	1700	Sun	UK, Bible Voice BC	13590me			
1600	1700		USA, American Forces Radio	4319usb	5446usb		
				5765usb	6350usb	7811usb	10320usb
				12133usb	13362usb		
1600	1700		USA, KAIJ Dallas TX	9480va			
1600	1700		USA, KJES Vado NM	11715na			
1600	1700		USA, KTBN Salt Lake City UT	15590na			
1600	1700		USA, KWHR Naalehu HI	9930as			
1600	1700		USA, Voice of America	4930af	6080af		
				12080va	13600va	15580af	17895va
1600	1700		USA, WBCQ Monticello ME	9330am			
1600	1700		USA, WBOH Newport NC	5920am			
1600	1700		USA, WEWN Vandiver AL	9450af			
1600	1700		USA, WHRA Greenbush ME	17640na			
1600	1700		USA, WHRI Cypress Creek SC		9840am		
				11960am	17640am		
1600	1700		USA, WINB Red Lion PA	13570am			
1600	1700	smtwhf	USA, WMLK Bethel PA	9265va	17495va		
1600	1700		USA, WRMI Miami FL	9955va			
1600	1700		USA, WTJC Newport NC	9370na			
1600	1700		USA, WWCR Nashville TN	9985na	12160na		
				13845na	15825na		
1600	1700		USA, WWRB Manchester TN	9385na			
1600	1700		USA, WYFR/Family Radio FL	6085am	13630af		
				13695va	15650af	15705af	18980va
				21455va	21525af		
1600	1700		Zambia, CVC International	15715af			
1615	1630		Vatican City, Vatican Radio	4005va	7250va		
				9645va	15595va		
1615	1645	mtwhf	Swaziland, TWR	6130af			
1615	1700		UK, Bible Voice BC		13590me		
1630	1645		UK, Bible Voice BC		13590me		
1630	1657		Slovakia, Radio Slovakia Int	5920eu	6055eu		
1630	1700		Guam, AWR/KSDA	6155as			
1630	1700		Nigeria, Voice of/ Ext. Svc Lagos		15120af		
1630	1700	Sat/Sun	Swaziland, TWR	6130af			
1630	1700	Sun	UK, Bible Voice BC		13590me		
1640	1650	mtwhfa	Turkmenistan, Turkmen Radio	4930eu			
1645	1700	f	Sweden, IBRA Radio	9830as			
1645	1700		Tajikistan, Tajik Radio	7245as			

1700 UTC - 1PM EDT / 12PM CDT / 10AM PDT

Start	Stop	Days	Station				
1700	1704		Canada, Radio Canada Intl	9515na			
1700	1715		Swaziland, TWR	3200af			
1700	1715	vl	UK, Bible Voice BC		13590me		
1700	1725		Vietnam, Voice of	7280va	9550va	9725eu	
				11630va	13860va		
1700	1727		Czech Rep, Radio Prague	5930eu	17485af		
1700	1730		Jordan, Radio	11690na			
1700	1730	Sun	UK, Bible Voice BC		13590me		
1700	1730		UK, Bible Voice BC		13590me		
1700	1730	Sat/Sun	USA, Voice of America	4930af			
1700	1730		USA, Voice of America	6080af	15580af		
1700	1745		UK, BBC World Service	9630af			
1700	1755		South Africa, Channel Africa	15235af			
1700	1756		Romania, Radio Romania Intl	9535eu	11735eu		
1700	1759		Poland, Radio Polonia	7140eu	7265eu		
1700	1800		Anguilla, University Network	11775am			
1700	1800		Australia, CVC International	13635as			
1700	1800		Australia, Radio Australia	5995va	6080va		
				7240as	9475as	9580va	9710va
				11660va	11880pa		
1700	1800	Sat	Canada, CBC NQ SW Service	9625na			
1700	1800		Canada, CFRX Toronto ON	6070na			
1700	1800		Canada, CFVP Calgary AB	6030na			
1700	1800		Canada, CKZN St John's NF	6160na			
1700	1800		Canada, CKZU Vancouver BC		6160na		
1700	1800		China, China Radio Intl	6100af	9570af		
				9695eu	11900af	11940eu	13760eu
1700	1800		Costa Rica, University Network		11870va		
				13750va			
1700	1800		Egypt, Radio Cairo	11740af			
1700	1800		Eqt. Guinea, Radio Africa	15190af			
1700	1800		Germany, CVC Intl/Voice Africa		15715af		
1700	1800		Germany, Universal Life	7285va			
1700	1800	fs	Italy, IRRS	7285eu			
1700	1800		Japan, Radio Japan/NHK World			9535va	
				11970na	15355af		
1700	1800		Malaysia, RTM/Trax FM	7295as			
1700	1800		New Zealand, Radio NZ Intl	7145pa			
1700	1800	DRM	New Zealand, Radio NZ Intl	6095pa			
1700	1800		Nigeria, Radio/Kaduna	4770do	6090al		
1700	1800		Nigeria, Voice of/ Ext. Svc Lagos		15120af		
1700	1800	vl	Papua New Guinea, Wantok R. Light	7325va			
1700	1800		Russia, Voice of	7350as	9405as	9850af	
				11510af	11985af		
1700	1800	Sat/Sun	Russia, Voice of	9820eu	9890eu		
1700	1800	vl	Rwanda, Radio	6055do			
1700	1800		Taiwan, Radio Taiwan Intl	15690af			
1700	1800	mtwhf	UK, BBC World Service	17830af			
1700	1800	DRM	UK, BBC World Service	1296eu	7465eu		
1700	1800		UK, BBC World Service				
				3915as	5975eu	6190af	6195eu
				7320eu	7380af	9410af	9510as
				11955as	12095af	15400af	15485af
				17840af	21470af		
1700	1800	Sat	UK, Bible Voice BC	9430me			
1700	1800		USA, American Forces Radio	4319usb	5446usb		
				5765usb	6350usb	7811usb	10320usb
				12133usb	13362usb		
1700	1800		USA, KAIJ Dallas TX	9480va			
1700	1800		USA, KTBN Salt Lake City UT	15590na			
1700	1800		USA, KWHR Naalehu HI	9930as			
1700	1800		USA, WBCQ Monticello ME	9330am	17495am		
1700	1800		USA, WBOH Newport NC	5920am			
1700	1800		USA, WEWN Vandiver AL	9450na	15390eu		
1700	1800		USA, WHRA Greenbush ME	15705na			
1700	1800		USA, WHRI Cypress Creek SC		9840am		
				11960am	15705am		
1700	1800		USA, WINB Red Lion PA	13570am			
1700	1800	smtwhf	USA, WMLK Bethel PA	9265va	17495va		
1700	1800		USA, WRMI Miami FL	9955va			
1700	1800		USA, WTJC Newport NC	9370na			
1700	1800		USA, WWCR Nashville TN	9985na	12160na		
				13845na	15825na		
1700	1800		USA, WWRB Manchester TN	9385na	12180na		
				15250va			
1700	1800		USA, WYFR/Family Radio FL	9890af	13630af		
				13690na	15650af	17795am	18980va
				21455va			
1700	1800		Zambia, CVC International	15715af			
1700	1750		North Korea, Voice of Korea	9335na	11710na		
				12014na	15245na		
1705	1800	DRM	Canada, Radio Canada Intl	9800na			
1730	1745		Israel, Kol Israel	9345eu	11590va	13675eu	
1730	1800		Bulgaria, Radio	5900eu	9600eu		
1730	1800		Guam, AWR/KSDA	9980me			
1730	1800	vl	Liberia, ELWA	4760do			
1730	1800		Swaziland, TWR	9500af			
1730	1800	DRM	Sweden, Radio	5955eu			
1730	1800		Sweden, Radio	6065va			
1730	1800		UK, Bible Voice BC	9430me	13590me		
1730	1800	Sat/Sun	USA, Voice of America	4930af			
1730	1800		USA, Voice of America	6080af	15410af		
				15580af			
1730	1800	mtwhf	USA, Voice of America	4930af	13755af		
				15775af			
1730	1800		Vatican City, Vatican Radio	11625af	13765af		
				15570af			
1745	1800		Bangladesh, Bangla Betar	7185as			
1745	1800		India, All India Radio	7410eu	9445af		
				9950eu	11620eu	11935af	13605af
				15075af	15155af	17670af	

1800 UTC - 2PM EDT / 1PM CDT / 11AM PDT

Start	Stop	Days	Station			
1800	1815	Sat	UK, Bible Voice BC	11875as		
1800	1828		Vietnam, Voice of	5955eu	7280va	9730va
1800	1830	w	Austria, AWR Europe	15315af		
1800	1830	f	Italy, IRRS	7285eu		
1800	1830		Nigeria, Radio, Natl Svc/Abuja		7275do	
1800	1830		South Africa, AWR Africa	3215af	3345af	
				9610af		
1800	1830		UK, BBC World Service	5975as	11955as	
1800	1830	Sun	UK, Bible Voice BC	6060eu		
1800	1830		UK, Bible Voice BC	13590me		
1800	1830	Sat/Sun	USA, Voice of America	4930af		
1800	1830		USA, Voice of America	6080af	15410af	
				15580af	17895af	
1800	1845	Sat	UK, Bible Voice BC	6060eu		
1800	1845		USA, WYFR/Family Radio FL	17535af		
1800	1850		New Zealand, Radio NZ Intl	7145pa		
1800	1850	DRM	New Zealand, Radio NZ Intl	9870pa		
1800	1900		Anguilla, University Network	11775am		
1800	1900	mtwhf	Argentina, RAE	9690eu	15345eu	

Start	Stop	Days	Station	Freq1	Freq2	Freq3	Freq4
1800	1900		Australia, Radio Australia	6080va	7240as		
			9475as	9500as	9580va	9710va	
			11880pa				
1800	1900		Bangladesh, Bangla Betar	7185eu			
1800	1900		Canada, CFRX Toronto ON	6070na			
1800	1900		Canada, CFVP Calgary AB	6030na			
1800	1900		Canada, CKZN St John's NF	6160na			
1800	1900		Canada, CKZU Vancouver BC		6160na		
1800	1900		Canada, Radio Canada Intl	9530af	11765af		
			15235af	17810af			
1800	1900	DRM	Canada, Radio Canada Intl	9800na			
1800	1900		China, China Radio Intl	9600eu	11940eu		
			13760eu				
1800	1900		Costa Rica, University Network		11870va		
			13750va				
1800	1900		Eqt. Guinea, Radio Africa	15190af			
1800	1900		Germany, CVC Intl/Voice Africa		13820af		
1800	1900		Germany, Universal Life	7285va			
1800	1900		India, All India Radio	7410eu	9445af		
			9950eu	11620eu	11935af	13605af	
			15075af	15155af	17670af		
1800	1900	Sun	Italy, IRRS	7285eu			
1800	1900		Kuwait, Radio Kuwait	11990na			
1800	1900	vl	Liberia, ELWA	4760do			
1800	1900		Malaysia, RTM/Trax FM	7295as			
1800	1900		Netherlands, Radio	6020af	7125af		
			11655af				
1800	1900		Nigeria, Radio/Kaduna	4770do	6090al		
1800	1900		Nigeria, Voice of/ Ext. Svc Lagos	15120af			
1800	1900		North Korea, Voice of Korea	13760eu	15245eu		
1800	1900	vl	Papua New Guinea, Wantok R. Light	7325va			
1800	1900		Russia, Voice of	7370eu	9745af	9850af	
			9890eu	11510af	11630eu		
1800	1900	vl	Rwanda, Radio	6055do			
1800	1900		South Korea, KBS World Radio		7275eu		
1800	1900		Swaziland, TWR	3200af	9500af		
1800	1900		Taiwan, Radio Taiwan Intl	3965eu			
1800	1900	DRM	UK, BBC World Service	7420eu			
1800	1900		UK, BBC World Service	5975as	5995as		
			6190af	6195eu	7380af	9410va	
			12095eu	15400af	17795af	21470af	
1800	1900	mtwhf	UK, BBC World Service	17830af			
1800	1900	Sat/Sun	UK, Bible Voice BC	9430me			
1800	1900		USA, American Forces Radio	4319usb	5446usb		
			5765usb	6350usb	7811usb	10320usb	
			12133usb	13362usb			
1800	1900		USA, KAIJ Dallas TX	9480va			
1800	1900		USA, KJES Vado NM	15385na			
1800	1900		USA, KTBN Salt Lake City UT	15590na			
1800	1900	smtwhf	USA, WBCQ Monticello ME	7415am			
1800	1900		USA, WBCQ Monticello ME	9330am	17495am		
1800	1900		USA, WBOH Newport NC	5920am			
1800	1900		USA, WEWN Vandiver AL	9450na	15390eu		
1800	1900		USA, WHRA Greenbush ME	15705na			
1800	1900		USA, WHRI Cypress Creek SC		9840am		
			11960am	15705am			
1800	1900		USA, WINB Red Lion PA	13570am			
1800	1900	smtwhf	USA, WMLK Bethel PA	9265va	17495va		
1800	1900		USA, WRMI Miami FL	9955va			
1800	1900		USA, WTJC Newport NC	9370na			
1800	1900		USA, WWCR Nashville TN	9975na	12160na		
			13845na	15825na			
1800	1900		USA, WWRB Manchester TN	9385va	12180na		
			15250va				
1800	1900		USA, WYFR/Family Radio FL	9845af	9860af		
			13630af	13690af	13730af	13800na	
			15650af	17795va	18980va		
1800	1900		Yemen, Rep of Yemen Radio	9780me			
1800	1900		Zambia, CVC International	5940af			
1805	1810	Sat	Croatia, Croatian Radio	6165eu			
1805	1815	mtwhf	Croatia, Croatian Radio	6165eu			
1830	1857		Slovakia, Radio Slovakia Int	5920eu	6055eu		
1830	1858		Serbia, International Radio Serbia		7240eu		
1830	1900		Turkey, Voice of	9785eu			
1830	1900		UK, BBC World Service	6005af	9485as		
			9630af				
1830	1900	f	UK, Bible Voice BC	9430me			
1830	1900		USA, Voice of America	4930af	6080af		
			15410af	15580af	17895af		
1845	1900	mtwhfa	Albania, Radio Tirana	6035eu	7465eu		
1845	1900		Congo, RTV Congolaise	4765af	5985af		
1845	1900	Sun	UK, Bible Voice BC	9775eu			
1851	1900	DRM	New Zealand, Radio NZ Intl	9890pa			
1851	1900		New Zealand, Radio NZ Intl	9615pa			

Start	Stop	Days	Station	Freq1	Freq2
1900	1903		Bahrain, Radio Bahrain	6010as	
1900	1905	DRM	Canada, Radio Canada Intl	9800na	
1900	1915		Congo, RTV Congolaise	4765af	5985af

Start	Stop	Days	Station	Freq1	Freq2	Freq3	Freq4
1900	1928		Vietnam, Voice of	7280va	9730va		
1900	1930		Germany, Deutsche Welle	9895af	11795as		
			17820af				
1900	1930		Turkey, Voice of	9785eu			
1900	1930	Sat	UK, Bible Voice BC	9775af			
1900	1930		UK, Bible Voice BC	6060eu			
1900	1945		India, All India Radio	7410eu	9445af		
			9950eu	11620eu	11935af	13605af	
			15075af	15155af	17670af		
1900	1945		USA, WYFR/Family Radio FL	6085am			
1900	1957	Sat/Sun	Netherlands, Radio	15315na	17660va		
			17735af				
1900	2000		Anguilla, University Network	11775am			
1900	2000		Australia, Radio Australia	6080va	7240as		
			9500as	9580va	9710va		
			11880pa				
1900	2000		Canada, CFRX Toronto ON	6070na			
1900	2000		Canada, CFVP Calgary AB	6030na			
1900	2000		Canada, CKZN St John's NF	6160na			
1900	2000		Canada, CKZU Vancouver BC		6160na		
1900	2000		China, China Radio Intl	7295va	9435va		
			9440va	11940eu			
1900	2000		Costa Rica, University Network		11870va		
			13750va				
1900	2000		Egypt, Radio Cairo	15375af			
1900	2000		Eqt Guinea, Radio Africa	15190af			
1900	2000		Germany, CVC Intl/Voice Africa		13820af		
1900	2000	vl	Liberia, ELWA	4760do			
1900	2000		Malaysia, RTM/Trax FM	7295as			
1900	2000		Netherlands, Radio	5905af	7115af		
			11655af	17810af			
1900	2000		New Zealand, Radio NZ Intl	9615pa			
1900	2000	DRM	New Zealand, Radio NZ Intl	9890pa			
1900	2000		Nigeria, Radio/Kaduna	4770do	6090al		
1900	2000		Nigeria, Voice of/ Ext. Svc Lagos	15120af			
1900	2000		North Korea, Voice of Korea	7100af	9975va		
			11535va	11910af			
1900	2000		Papua New Guinea, NBC	4890do			
1900	2000	vl	Papua New Guinea, Wantok R. Light	7325va			
1900	2000		Russia, Voice of	7195eu	7310eu	9890eu	
			12070eu				
1900	2000	vl	Rwanda, Radio	6055do			
1900	2000	vl	Solomon Islands, SIBC	5020do	9545al		
1900	2000		Swaziland, TWR	3200af			
1900	2000	vl	Uganda, Radio	4976do	5026do		
1900	2000	DRM	UK, BBC World Service	7420eu			
1900	2000		UK, BBC World Service	5995as	6005as		
			6190af	9410af	9455af	9485af	
			9630as	15400af	17795as		
1900	2000	mtwhf	UK, BBC World Service	17830af			
1900	2000	Sun	UK, Bible Voice BC	9775af			
1900	2000		Ukraine, Radio Ukraine Intl	7490eu			
1900	2000		USA, American Forces Radio	4319usb	5446usb		
			5765usb	6350usb	7811usb	10320usb	
			12133usb	13362usb			
1900	2000		USA, KAIJ Dallas TX	9480va			
1900	2000		USA, KJES Vado NM	15385na			
1900	2000		USA, KTBN Salt Lake City UT	15590na			
1900	2000		USA, Voice of America	4930va	4940af		
			6080af	7480va	9670va	15410af	
			15445af	15580af	17895af		
1900	2000		USA, WBCQ Monticello ME	7415am	9330am		
			17495am				
1900	2000		USA, WBOH Newport NC	5920am			
1900	2000		USA, WEWN Vandiver AL	9450na	15390eu		
1900	2000		USA, WHRA Greenbush ME	13710na			
1900	2000		USA, WHRI Cypress Creek SC		9840am		
			13710am	17650am			
1900	2000		USA, WINB Red Lion PA	13570am			
1900	2000	smtwhf	USA, WMLK Bethel PA	9265va	17495va		
1900	2000		USA, WRMI Miami FL	9955va			
1900	2000		USA, WTJC Newport NC	9370na			
1900	2000		USA, WWCR Nashville TN	9975na	12160na		
			13845na	15825na			
1900	2000		USA, WWRB Manchester TN	9385va	12180na		
			15250va				
1900	2000		USA, WYFR/Family Radio FL	7240va	9860af		
			13690na	13800na	17795am	17845af	
			18930eu				
1900	2000		Zambia, CVC International	5940af			
1900	2000		Kuwait, Radio Kuwait	11990na			
1930	2000	Sat/Sun	Germany, Pan American BC	5850me			
1930	2000		Iran, Voice of the Islamic Rep	6205eu	6255eu		
			7205af	9800af	9925af		
1930	2000		Lithuania, Radio Vilnius	6255eu			
1930	2000		Sweden, Radio	6065va			
1935	1955		Italy, RAI Italia	5960eu	9845eu		
1945	2000	DRM	Vatican City, Vatican Radio	9800na			
1950	2000		Vatican City, Vatican Radio	4005eu	5885eu		
			9645eu				

2000 UTC - 4PM EDT / 3PM CDT / 1PM PDT

2000	2015	Sun	Germany, Pan American BC	5850me	
2000	2020		Vatican City, Vatican Radio 9645af	4005af	5885af
2000	2027		Czech Rep, Radio Prague	5930eu	11600va
2000	2027		Lithuania, Radio Vilnius	6255eu	
2000	2030	twhfas	Albania, Radio Tirana	7465af	13720va
2000	2030		Egypt, Radio Cairo	15375af	
2000	2030		Germany, AWR Europe	15235as	
2000	2030	f	Germany, Pan American BC	5850me	
2000	2030		Iran, Voice of the Islamic Rep 7205af 9800af	6205eu 9925af	6255eu
2000	2030		Swaziland, TWR 3200af		
2000	2030		Turkey, Voice of 6195eu		
2000	2030		USA, Voice of America 6080af 15455af	4930af 15580af	4940af
2000	2030		Vatican City, Vatican Radio 11625af	7365af	9755af
2000	2030	DRM	Vatican City, Vatican Radio	9800na	
2000	2045		USA, WYFR/Family Radio FL	17750eu	
2000	2050		New Zealand, Radio NZ Intl	9615pa	
2000	2050	DRM	New Zealand, Radio NZ Intl	9890pa	
2000	2057		Germany, Deutsche Welle	7130af	11795af
2000	2059		Canada, Radio Canada Intl 15325eu	5850eu	7235eu
2000	2100		Anguilla, University Network	11775am	
2000	2100		Australia, ABC NT Alice Springs 4835do		2310do
2000	2100		Australia, ABC NT Katherine	2485do	
2000	2100		Australia, ABC NT Tennant Creek		2325do
2000	2100		Australia, Radio Australia 9500as 11880pa	6080va 11650pa	7240as 11650pa 11660pa
2000	2100		Canada, CFRX Toronto ON	6070na	
2000	2100		Canada, CFVP Calgary AB	6030na	
2000	2100		Canada, CKZN St John's NF	6160na	
2000	2100		Canada, CKZU Vancouver BC		6160na
2000	2100	DRM	Canada, Radio Canada Intl	9800na	
2000	2100		China, China Radio Intl 7265eu 9800eu	5960eu 7295af 11640af	7190eu 9440af 13630af 9600eu
2000	2100		Costa Rica, University Network		13750va
2000	2100		Eqt Guinea, Radio Africa	15190af	
2000	2100		Germany, CVC Intl/Voice Africa		13820af
2000	2100		Germany, Deutsche Welle	11865af	15205af
2000	2100		Indonesia, Voice of 15150al	9525eu	11785eu
2000	2100		Kuwait, Radio Kuwait	11990na	
2000	2100	vl	Liberia, ELWA 4760do		
2000	2100		Malaysia, RTM/Trax FM	7295as	
2000	2100		Netherlands, Radio 17810af	5905af	7115af
2000	2100	Sat/Sun	Netherlands, Radio 17735na	15315na	17660va
2000	2100		Nigeria, Radio/Kaduna	4770do	6090al
2000	2100		Nigeria, Voice of/ Ext. Svc Lagos		15120af
2000	2100		Papua New Guinea, NBC	4890do	
2000	2100	vl	Papua New Guinea, Wantok R. Light		7325va
2000	2100		Russia, Voice of 9890eu		12070eu
2000	2100	vl	Rwanda, Radio 6055do		
2000	2100	vl	Solomon Islands, SIBC	5020do	9545al
2000	2100		South Africa, Channel Africa 3345af		
2000	2100	mtwhf	Spain, Radio Exterior Espana 9665eu		11625af
2000	2100	vl	Uganda, Radio 4976do	5026do	
2000	2100		UK, BBC World Service 9410af 9455af	6005af 9630af	6190af 15400af
2000	2100	mtwhf	UK, BBC World Service	17830af	
2000	2100	DRM	UK, BBC World Service	5875eu	
2000	2100		USA, American Forces Radio 5765usb 6350usb 12133usb 13362usb	4319usb 7811usb	5446usb 10320usb
2000	2100		USA, KAIJ Dallas TX	9480va	
2000	2100		USA, KJES Vado NM	15385na	
2000	2100		USA, KTBN Salt Lake City UT	15590na	
2000	2100		USA, WBCQ Monticello ME 17495am	7415am	9330am
2000	2100		USA, WBOH Newport NC	5920am	
2000	2100		USA, WEWN Vandiver AL	9450na	15220af
2000	2100	mtwhf	USA, WHRA Greenbush ME	7400na	
2000	2100	Sat/Sun	USA, WHRA Greenbush ME	11885na	
2000	2100		USA, WHRI Cypress Creek SC		17650am
2000	2100	Sat/Sun	USA, WHRI Cypress Creek SC 11885am		9840am
2000	2100	mtwhf	USA, WHRI Cypress Creek SC 13670am		7400am
2000	2100		USA, WINB Red Lion PA	13570am	
2000	2100	smtwhf	USA, WMLK Bethel PA	9265va	17495va
2000	2100		USA, WRMI Miami FL	9955va	

2000	2100		USA, WTJC Newport NC	9370na	
2000	2100		USA, WWCR Nashville TN 13845na	9975na	12160na
2000	2100		USA, WWRB Manchester TN 15250va	9385va	12180na
2000	2100		USA, WYFR/Family Radio FL 17725am 17845am	3230af 18980va	7430eu
2000	2100		Zambia, CVC International	5940af	
2005	2100		Syria, Radio Damascus	9330eu	12085eu
2020	2100		Belarus, Radio 7440al	7105eu	7390eu 7420eu
2025	2045		Italy, RAI Italia	5970va	11875va
2030	2045		Thailand, Radio 9680eu		
2030	2056		Romania, Radio Romania Intl 11940va	9515va 15465va	11810va
2030	2058		Vietnam, Voice of 13860va	7280va	9550va 9730va
2030	2100		Cuba, Radio Havana	9505va	11760va
2030	2100	DRM	Netherlands, Radio	9800na	
2030	2100		Turkey, Voice of 7170va		
2030	2100		USA, Voice of America 7555as 15445af	4930af 15580af	6080af
2030	2100	Sat/Sun	USA, Voice of America	4940af	
2045	2100		India, All India Radio 9910pa 11620va	7410eu 11715pa	9445eu
2051	2100		New Zealand, Radio NZ Intl	15720pa	

2100 UTC - 5PM EDT / 4PM CDT / 2PM PDT

2100	2130		Australia, ABC NT Katherine	2485do	
2100	2130		Australia, ABC NT Tennant Creek		2325do
2100	2130		Austria, AWR Europe	11955af	
2100	2130	Sat	Canada, CBC NQ SW Service	9625na	
2100	2130		China, China Radio Intl 7285eu 9490eu 13630af	5960eu 9600eu	7190eu 11640af
2100	2130		Cuba, Radio Havana	9505va	11760va
2100	2130		Nigeria, Radio, Natl Svc/Abuja	7275do	
2100	2130		South Korea, KBS World Radio	3955eu	
2100	2130		Turkey, Voice of 7170va		
2100	2145		USA, WYFR/Family Radio FL 18980va	13800na	17795am
2100	2150	DRM	New Zealand, Radio NZ Intl	11675pa	
2100	2159	smtwhf	Germany, Overcomer Ministries		7310eu
2100	2159	Sat/Sun	Spain, Radio Exterior Espana	9840eu	11625af
2100	2200		Anguilla, University Network	11775am	
2100	2200		Australia, ABC NT Alice Springs 4835do		2310do
2100	2200		Australia, Radio Australia 11650pa 13630as	9500as 11660pa 15515as	9660as 11695as 12080as
2100	2200		Bulgaria, Radio 5900eu		9700eu
2100	2200		Canada, CFRX Toronto ON	6070na	
2100	2200		Canada, CFVP Calgary AB	6030na	
2100	2200		Canada, CKZN St John's NF	6160na	
2100	2200		Canada, CKZU Vancouver BC		6160na
2100	2200	DRM	Canada, Radio Canada Intl	9800na	
2100	2200		Costa Rica, University Network		13750va
2100	2200		Eqt Guinea, Radio Africa	15190af	
2100	2200		Germany, Deutsche Welle 15205af	9735af	11865af
2100	2200		Guyana, Voice of 3291do	5950do	
2100	2200		India, All India Radio 9910pa 11620va	7410eu 11715pa	9445eu
2100	2200		Japan, Radio Japan/NHK World 6055eu 6180eu 17870pa	11855eu	6035va 17825na
2100	2200	vl	Liberia, ELWA 4760do		
2100	2200		Malaysia, RTM/Trax FM	7295as	
2100	2200		New Zealand, Radio NZ Intl	15720pa	
2100	2200		Nigeria, Radio/Kaduna	4770do	6090al
2100	2200		Nigeria, Voice of/ Ext. Svc Lagos		7255af
2100	2200		North Korea, Voice of Korea	13760eu	15245eu
2100	2200		Papua New Guinea, NBC	4890do	
2100	2200	vl	Papua New Guinea, Wantok R. Light		7325va
2100	2200		South Africa, Channel Africa 3345af		
2100	2200		Syria, Radio Damascus	9330eu	12085eu
2100	2200		UK, BBC World Service 6190af 12095af	3915as 6195af 13640am	6005af 11675am 11945as 15400af
2100	2200	DRM	UK, BBC World Service	5875eu	
2100	2200		Ukraine, Radio Ukraine Intl	7510eu	
2100	2200		USA, American Forces Radio 5765usb 6350usb 12133usb 13362usb	4319usb 7811usb	5446usb 10320usb
2100	2200		USA, KAIJ Dallas TX	9480va	
2100	2200		USA, KTBN Salt Lake City UT	15590na	
2100	2200		USA, Voice of America	6080af	15580af
2100	2200		USA, WBCQ Monticello ME	7415am	9330am

		17495am		
2100	2200	USA, WBOH Newport NC	5920am	
2100	2200	USA, WEWN Vandiver AL	9450am	15220af
2100	2200 mtwhf	USA, WHRA Greenbush ME	7400na	
2100	2200 Sat/Sun	USA, WHRA Greenbush ME	11885na	
2100	2200 mtwhf	USA, WHRI Cypress Creek SC		7400am
		13670am		
2100	2200 Sat/Sun	USA, WHRI Cypress Creek SC		11885am
2100	2200	USA, WINB Red Lion PA	13570am	
2100	2200 mtwhfa	USA, WRMI Miami FL	9955va	
2100	2200 Sun	USA, WRMI Miami FL	7385na	
2100	2200	USA, WTJC Newport NC	9370na	
2100	2200	USA, WWCR Nashville TN	9975na	12160na
		13845na		
2100	2200	USA, WWRB Manchester TN	9385va	12180na
		15250va		
2100	2200	USA, WYFR/Family Radio FL	3230af	7430eu
		9610af	11565eu	17795am	17845af
2115	2200	Egypt, Radio Cairo	9990eu	
2130	2157	Czech Rep, Radio Prague	9410af	11600na
2130	2200	Australia, ABC NT Katherine	5025do	
2130	2200	Australia, ABC NT Tennant Creek		4910do
2130	2200 mtwhfa	Canada, CBC NQ SW Service	9625va	
2130	2200	Guam, AWR/KSDA	11850as	
2130	2200	Sweden, Radio	6065va	7420va
2151	2200 DRM	New Zealand, Radio NZ Intl	13730pa	

2200 UTC - 6PM EDT / 5PM CDT / 3PM PDT

2200	2210	Syria, Radio Damascus	9330eu	12085eu
2200	2230 DRM	Germany, Deutsche Welle	9800na	
2200	2230	India, All India Radio	7410eu	9445eu
		9910pa	11620va	11715pa
2200	2230 vl	Liberia, ELWA	4760do	
2200	2230	Papua New Guinea, NBC	4890do	
2200	2245	Egypt, Radio Cairo	9990eu	
2200	2245	USA, WYFR/Family Radio FL	15770af	
2200	2256	Romania, Radio Romania Intl	7185va	9675va
		9790va	11940va	
2200	2300	Anguilla, University Network	6090am	
2200	2300	Australia, ABC NT Alice Springs		2310do
		4835do		
2200	2300	Australia, ABC NT Katherine	5025do	
2200	2300	Australia, ABC NT Tennant Creek		4910do
2200	2300	Australia, Radio Australia	13620va	13630va
		15230va	15240pa	17785va
2200	2300 smtwhf	Canada, CBC NQ SW Service	9625na	
2200	2300	Canada, CFRX Toronto ON	6070na	
2200	2300	Canada, CFVP Calgary AB	6030na	
2200	2300	Canada, CKZN St John's NF	6160na	
2200	2300	Canada, CKZU Vancouver BC		6160na
2200	2300	China, China Radio Intl	7175eu	9590as
2200	2300	Costa Rica, University Network		13750va
2200	2300	Eqt Guinea, Radio Africa	15190af	
2200	2300	Guyana, Voice of	3291do	
2200	2300	Malaysia, RTM/Trax FM	7295as	
2200	2300 DRM	New Zealand, Radio NZ Intl	13730pa	
2200	2300	New Zealand, Radio NZ Intl	15720pa	
2200	2300	Nigeria, Radio/Kaduna	4770do	6090al
2200	2300	Nigeria, Voice of/ Ext. Svc Lagos		7255af
2200	2300 vl	Papua New Guinea, Wantok R. Light		7325va
2200	2300 vl	Solomon Islands, SIBC	5020do	9545al
2200	2300	Taiwan, Radio Taiwan Intl	15600eu	
2200	2300	Turkey, Voice of	6195va	
2200	2300	UK, BBC World Service	5955as	5965as
		5975as	6195as	7105as	9740as
		12095af	13640am	15400af
2200	2300	USA, American Forces Radio	4319usb	5446usb
		5765usb	6350usb	7811usb	10320usb
		12133usb	13362usb	
2200	2300	USA, KAIJ Dallas TX	9480va	
2200	2300	USA, KTBN Salt Lake City UT	15590na	
2200	2300	USA, Voice of America	7120va	9415as
		11725va	15185va	
2200	2300 mtwhf	USA, WBCQ Monticello ME	5110am	17495am
2200	2300	USA, WBCQ Monticello ME	7415am	9330na
2200	2300	USA, WBOH Newport NC	5920am	
2200	2300	USA, WEWN Vandiver AL	9975na	15745eu
2200	2300	USA, WHRA Greenbush ME	11885na	
2200	2300 mtwhfa	USA, WHRI Cypress Creek SC		9515am
2200	2300	USA, WHRI Cypress Creek SC		11885am
2200	2300	USA, WINB Red Lion PA	13570am	
2200	2300	USA, WRMI Miami FL	9955va	
2200	2300	USA, WTJC Newport NC	9370na	
2200	2300	USA, WWCR Nashville TN	7465na	9985na
		12160na	13845na	
2200	2300	USA, WWRB Manchester TN	6890na	9385va
		12180na	15250va	
2200	2300 Sat/Sun	USA, WWRB Manchester TN	3185na	15250va

		15250va		
2200	2300	USA, WYFR/Family Radio FL	9620af	11740na
2205	2230	Italy, RAI Italia	11895va	
2215	2230	Croatia, Croatian Radio	6165eu	9925eu
2230	2257	Czech Rep, Radio Prague	7345na	9415na
2230	2300	Guam, AWR/KSDA	15320as	
2230	2300	Papua New Guinea, NBC	9675do	
2230	2300	USA, Voice of America	9570va	11705va
		15145va		
2245	2300	India, All India Radio	9705as	9950as
		11620as	11645as	13605as

2200 UTC - 7PM EDT / 6PM CDT / 4PM PDT

2300	2300	Bulgaria, Radio	9700na	11700na
2300	2315	Nigeria, Radio/Kaduna	4770do	6090al
2300	2330	Australia, Radio Australia	9660as	12080as
		13620pa	13670pa	15230pa	15240va
		17785va	17795va	
2300	2330	USA, Voice of America	9570va	13755va
		15145va		
2300	2345	USA, WYFR/Family Radio FL	11740na	
2300	2345 DRM	Vatican City, Vatican Radio	7370na	
2300	0000	Anguilla, University Network	6090am	
2300	0000	Australia, ABC NT Alice Springs		2310do
		4835do		
2300	0000	Australia, ABC NT Katherine	5025do	
2300	0000	Australia, ABC NT Tennant Creek		4910do
2300	0000 smtwhf	Canada, CBC NQ SW Service	9625na	
2300	0000	Canada, CFRX Toronto ON	6070na	
2300	0000	Canada, CFVP Calgary AB	6030na	
2300	0000	Canada, CKZN St John's NF	6160na	
2300	0000	Canada, CKZU Vancouver BC		6160na
2300	0000	China, China Radio Intl	5915as	5990na
		6145na	7180as	11685as	11840na
2300	0000	Costa Rica, University Network		13750va
2300	0000	Cuba, Radio Havana	9550va	
2300	0000	Egypt, Radio Cairo	9460na	
2300	0000	Guyana, Voice of	3291do	
2300	0000	India, All India Radio	9705as	9950as
		11620as	11645as	13605as
2300	0000	Malaysia, RTM/Trax FM	7295as	
2300	0000 DRM	New Zealand, Radio NZ Intl	13730pa	
2300	0000	New Zealand, Radio NZ Intl	15720pa	
2300	0000	Papua New Guinea, NBC	9675do	
2300	0000 vl	Papua New Guinea, Wantok R. Light		7325va
2300	0000	Singapore, MediaCorp Radio	6150do	
2300	0000 vl	Solomon Islands, SIBC	5020do	9545al
2300	0000	UK, BBC World Service	3915as	5965as
		6195as	9740as	11945as	11955as
		12010as		
2300	0000	USA, American Forces Radio	4319usb	5446usb
		5765usb	6350usb	7811usb	10320usb
		12133usb	13362usb	
2300	0000	USA, KAIJ Dallas TX	9480va	
2300	0000	USA, KTBN Salt Lake City UT	15590na	
2300	0000	USA, Voice of America	7120va	9415va
		11725va	15185va	
2300	0000	USA, WBCQ Monticello ME	5110na	7415am
		9330am	17495am	
2300	0000	USA, WBOH Newport NC	5920am	
2300	0000	USA, WEWN Vandiver AL	9975va	15745eu
2300	0000	USA, WHRA Greenbush ME	7520na	
2300	0000 Sun	USA, WHRI Cypress Creek SC		7490am
2300	0000	USA, WHRI Cypress Creek SC		7315am
		7520am		
2300	0000 mtwhfa	USA, WHRI Cypress Creek SC		9515am
2300	0000 Sun	USA, WHRI Cypress Creek SC		7490am
2300	0000	USA, WINB Red Lion PA	9265am	
2300	0000	USA, WRMI Miami FL	9955va	
2300	0000	USA, WTJC Newport NC	9370na	
2300	0000	USA, WWCR Nashville TN	5070na	7465na
		9985na	13845na	
2300	0000	USA, WWRB Manchester TN	3185na	5050na
		6890na	15250va	
2300	0000	USA, WYFR/Family Radio FL	15255am	17750am
2305	0000	Canada, Radio Canada Intl	6100na	
2305	0000	Greece, Voice of	7475eu	9420eu	15650eu
2330	2358	Vietnam, Voice of	9840as	12020as
2330	2359 DRM	Sweden, Radio	9800na	
2330	0000	Australia, Radio Australia	9660as	12080as
		13620pa	13670pa	15230pa	15415va
		17750va	17785va	17795va
2330	0000	Burma, Dem Voice of Burma	5955eu	
2330	0000	Lithuania, Radio Vilnius	9875na	
2330	0000	UK, BBC World Service	9580as	
2330	0000	USA, Voice of America	7350va	9570va
		13755va	15145va	

More 380-400 MHz Trunk Systems

In last month's column we profiled some of the new National Capitol Region 380-400 MHz trunk systems that have been uncovered by radio monitors. But these aren't the only systems popping up across the country. The US Navy and Marine Corps are also getting in on the act. They are developing a large nationwide network of trunk radio systems in the 380-400 MHz frequency range. Based on material that is available in the public domain, I believe this network is known as the Enterprise LMR system.

Thanks to monitoring help by Mark and LauraQ in California, Robert Wyman here in the Southeast U.S., and Chris Parris, *MT Fed Files* columnist, we now have a clearer picture of this far flung network (presented below).

DEPARTMENT OF DEFENSE
California/Florida/Georgia/Virginia/Washington
Enterprise LMR System
System: Project 25 Standard
System ID: 014c
P25 WACN: BEE00

For *MT* purposes only, I have assigned the following *arbitrary* site numbers for the various locations listed below. These are not official designations.

Sites beginning with 1 are Washington sites (USN/ USMC Pacific NW).
Sites beginning with 2 are Washington sites (Fort Lewis WA).
Sites beginning with 3 are Southeast United States sites.
Sites beginning with 4 are Virginia sites.
Sites beginning with 5 are California sites.

CALIFORNIA

CA-501	385.0125/395.0125c
	385.2125/395.2125
	385.8875/395.8875
	386.1250/396.1250c
	386.2750/396.2750
	386.4250/396.4250
	386.5750/396.5750
	386.9375/396.9375
	388.2375/398.2375

US Marine Corps service member using LMR radio (US Navy Photo)

	388.3875/398.3875
	388.5375/398.5375
	388.7250/398.7250 [Los Angeles Area]
CA-502	386.1000/396.1000c
	386.2500/396.2500
	386.4000/396.4000
	386.5500/396.5500 386.8500/396.8500
	388.0250/398.0250 [Los Angeles Area]
CA-503	386.0375/396.0375c
	386.3375/396.3375c [Los Angeles Area]
CA-504	386.0125/396.0125c
	386.6125/396.6125
	386.7625/396.7625
	388.0375/398.9375
	388.2500/398.2500 [MCB Camp Pendleton/Pendleton MCAS]
CA-506	385.3500/395.3500c
	385.9125/395.9125 [Escondido?]
CA-507	386.0625/396.0625 [Lake Elsinore]
CA-508	386.3750/396.3750c [Pleasants Peak]

Other frequencies reported: 386.6500/396.650

FLORIDA/GEORGIA - SOUTHEAST US

FL-301	386.4500/396.4500c
	386.1875/396.1875c
FL-302	386.4625/396.4625c
FL-303	386.4250/396.4250c [Eglin AFB]
FL-304	385.0125/395.0125c [Eglin AFB]
FL-305	385.0625/395.0625c
	385.3500/305.3500
	386.1375/396.1375
	386.4125/396.4125
	388.0250/398.0250
	388.8875/398.8875 [Hurlburt Field]
FL-313	385.5625/395.5625c
	386.2250/396.2250c [Mayport NS]
FL-315	386.2750/396.2750c [Kings Bay NS]
FL-316	380.4375/390.4375c [NAS Jacksonville]
FL-320	380.4625/390.4625c
FL-321	385.5125/395.5125c

Other frequencies reported: 385.0125/395.0125

	385.0625/395.0625
	385.2125/395.2125
	386.1875/396.1875
	386.4250/396.4250c
	386.4625/396.4625c

VIRGINIA

VA-401	385.6750/395.6750c
	386.4875/396.4875
	386.7375/396.7375
	387.5750/397.5750
	387.9875/397.9875
	389.3375/399.3375 [Camp Barnett]
VA-402	385.6250/395.6250c
	386.4375/396.4375
	386.9125/396.9125
	387.9500/397.9500 [MCB Quantico]
VA-403	380.4875/390.4875c
	381.2000/391.2000
	381.3375/391.3375
	381.6875/391.6875
	381.83750/391.8375 [Pentagon]
VA-404	386.1125/396.1125c [Independence Hill]
VA-405	386.2500/396.2500c [Fredericksburg]

PACIFIC NORTHWEST - WASHINGTON
U. S. Navy/Marine Corps System

WA-101	385.0625/395.0625c
WA-102	385.3125/395.3125c
	385.9000/395.9000c
	386.0125/396.0125
WA-103	386.1250/396.1250c

WA-104	386.1875/396.1875c
WA-105	385.3500/395.3500c
	385.9125/395.9125c
	386.0625/396.0625
	386.6625/396.6625
	386.8000/396.8000
WA-106	385.0125/395.0125
	386.4125/396.4125c
	386.6125/396.6125c
	386.8125/386.8125
WA-107	386.3500/396.3500c
WA-108	385.8875/395.8875c
	386.3375/396.3375c
	386.6375/396.6375
WA-109	386.1000/396.1000c
WA-110	386.6750/396.6750c
	386.8250/396.8250c
WA-111	386.0750/396.0750c
	386.2250/396.2250c
WA-112	386.1625/396.1625c
	386.7625/396.7625c
WA-114	385.8875c 386.0750c 386.1000c
	386.3750 386.5500 386.6375
	386.6750c 386.7000 388.0000
	388.1500 [NAS Whidbey Island]

U.S. Army System – Fort Lewis, Washington

WA-201	380.0750/390.0750c
	380.1750/390.1750
	380.2750/390.2750
	380.3875/390.3875
	380.4250/390.4250
	380.5375/390.5375
	380.5750/390.5750
	380.8750/390.8750
	380.9875/390.9875
	381.0875/391.0875
	381.1750/391.1750
	381.2375/391.2375
	381.3125/391.3125
	381.4250/391.4250
	381.6250/391.6250
	381.8250/391.8250
	381.8500/391.8500 [Fort Lewis]
WA-202	380.2125/390.2125
	380.5500/390.5500
	380.8375/390.8375
	381.0125/391.0125
	381.2875/391.2875 [Southside of Fort Lewis]
WA-203	380.7250/390.7250
WA-205	380.2750/390.2750
	380.3875/390.3875
	380.4250/390.4250
WA-207	380.2750/390.2750c [Yakima Firing Range Area]
WA-208	380.7250/390.7250
	380.9375/390.9375c [Yakima Firing Range]

System Talkgroups:

23292	NAS Whidbey Military Police
23321	NB Kitsap Fire Department Dispatch
23322	NAS Whidbey Fire Dispatch
31502	MCB Camp Pendleton Telephone Maintenance (Oscar Units)
31504	MCB Camp Pendleton Telephone Maintenance (Oscar Units)
31506	MCB Camp Pendleton (Tango Units)
31515	MCB Camp Pendleton Electronics Maintenance (Romeo Units)
31971	MCB Camp Pendleton (Uniform Units)
32316	MCB Quantico Range
32317	MCB Quantico The Basic School
32424	MCB Quantico Airfield Operations (some

	encryption)
32801	MCB Quantico Range Control
32803	MCB Quantico Range
32901	MCB Quantico The Basic School
32902	MCB Quantico The Basic School
32903	MCB Quantico The Basic School
40111	Eglin AFB Fire Department
40112	Eglin AFB Crash
40113	Eglin AFB Fire Dispatch
40117	Eglin AFB Fire Department
40138	Eglin AFB Rescue/EMS
40147	Eglin AFB Security
40148	Eglin AFB Police
40152	Eglin AFB Security
40154	Eglin AFB Range Patrol
40184	Eglin AFB Fire Department
40237	Eglin AFB Test Control
40246	Eglin AFB Fuels
40248	Eglin AFB POL Refuel
40331	Eglin AFB Range Operations
40343	Eglin AFB Wolf Call
40400	Eglin AFB AGE
40510	Eglin AFB 46th MOC
40513	Eglin AFB Ground
40602	Eglin AFB Maintenance Center
42108	Hurlburt Field Tower/Ground
42200	Hurlburt Field Aircraft Maintenance
42201	Hurlburt Field Aircraft Maintenance
42202	Hurlburt Field Aircraft Maintenance
42203	Hurlburt Field Aircraft Maintenance
42205	Hurlburt Field Aircraft Maintenance
42205	Hurlburt Field Aircraft Maintenance
42206	Hurlburt Field Aircraft Maintenance
42207	Hurlburt Field Aircraft Maintenance
42208	Hurlburt Field Aircraft Maintenance
42209	Hurlburt Field Aircraft Maintenance
42210	Hurlburt Field Aircraft Maintenance
42211	Hurlburt Field Aircraft Maintenance Control
42212	Hurlburt Field Aircraft Maintenance
42214	Hurlburt Field Aircraft Maintenance
42308	Hurlburt Field POL Refuel
42310	Eglin AFB Range Operations
42313	Hurlburt Field Transportation
42315	Eglin AFB Unknown user/usage
42401	Hurlburt Field Security Forces
42412	Hurlburt Field Fire/Crash
42415	Hurlburt Field Fire Tac-1
42418	Hurlburt Field Fire Tac-3
42424	Hurlburt Field Billeting
42435	Eglin AFB Unknown user/usage
42433	Hurlburt Field Police <Channel 1>
42434	Hurlburt Field Police <Channel 2>
42440	Hurlburt Field Civil Engineering Control
42441	Hurlburt Field Civil Engineering Control
42442	Hurlburt Field Civil Engineering Control
42443	Hurlburt Field Civil Engineering Control
42444	Hurlburt Field HVAC
42445	Hurlburt Field Plumbing
42446	Eglin AFB Civil Engineers
42448	Hurlburt Field Housing Maintennce
42453	Eglin AFB Transportation
42623	Hurlburt Field ATOC

Based on open source information we now know that additional bases either have or will get an Enterprise LMR system. I would like to get field reports on any 380-400 MHz activity from anyone within range of the following bases: MCB Camp Lejeune, NC; MCAS Cherry Point, NC; MCAS Yuma, AZ; MCMWTC Bridgeport, CA; MCAGCC 29 Palms, CA; MCAS Beaufort, SC; MCRD Parris Island, SC; MCLB Albany, GA; Henderson Hall, VA; MCLB Barstow, CA; and Blount Island, FL.

I also have information that indicates that Fort Sill in Oklahoma is supposed to bring a 380-400 MHz online. And I am still looking for any reports from the Denver/Colorado Springs area on their new 380-400 MHz LMR system. You can reach me at the email address in the masthead.

❖ New London Submarine Base

MT's Chris Parris had a little time to survey the New London Submarine Base on the Thames River near Groton, CT, recently. Chris reports, "First off, they have a wonderful submarine museum near the front gate of the base that offers a picnic area and a great view of the Security Zone on the Thames River."

Chris plugged in all the known reported VHF frequencies and says that there have been some changes to what has been published in lists for this area. He also searched out the 380-400 MHz and 406-420 MHz bands, but found nothing unusual there.

Here is what Chris found active:

138.8500	Civil Engineering repeater (CSQ)
138.9500	Data bursts, sounded like stuff he has heard listed as "Base Fire Alarm" data on some lists.(CSQ)
140.2250	Unknown user/usage (CSQ)
140.7000	Base Security repeater, lots of stations checking in with radio checks. (CSQ)
140.9500	Strange short tone sequences heard - unknown user. (CSQ)
142.3125	"Please call Pier Security by landline..." (114.8 Hz PL)
143.6000	Input to 140.7000 MHz repeater. (186.2 Hz PL)
162.1250	US Coast Guard Tactical (CSQ) <CC-9>
171.3625	Listed as being the US Coast Guard Academy, located just across the Mystic River from the sub base. (P25)
464.5500	Used at Nautilus Museum

❖ Westover JARB Update

An anonymous source passed along the following update for Westover.

138.0750	Repeater Law Enforcement Security Net #1? (Channel #1)
138.4250	Repeater Law Enforcement Security Net #2? (Channel #2)
148.4625	Input to the 138.0750 MHz repeater.
148.5375	Input to the 138.4250 MHz repeater.

❖ New Ohio Guard HF Frequency

Jack Metcalfe in Kentucky has found a new HF ALE frequency for the National Guard in Ohio. He monitored the ALE addresses ANGSPRINGFIELD and NGTROOPCMD on 2492.0 kHz USB. Thanks for the update, Jack.

❖ Milair Frequency Changes

Regular *MT Milcom* reporter Jack NeSmith checks in with a nice list of recent frequency changes in the military/civilian aeronautical bands.

Andrews AFB, MD (KADW)
251.500	Navy Operations

Barksdale AFB, LA (KBAD)
307.025	ATIS (New)

Cannon AFB, NM (KCVS)
311.000	Command Post (New)
381.300	TOD Frequency (New)

Charleston AFB, SC (KCHS)
291.650	Clearance Delivery (ex-381.600 MHz)

Elmendorf AFB, AK (PAED)
128.800	Clearance Delivery
306.925	Clearance Delivery

Fort Campbell/Sabre AHP, KY (KEOD)
49.700	Sabre Eagle Pre-flight (no longer used)
265.500	Sabre Eagle Pre-flight (new)

Goodman AAF, KY (KFTK)
38.800	Range Control <Secondary>
38.900	Range Control <Primary>
133.350	Tower (ex-126.800 MHz)

Gray AAF, WA (KGRF)
120.100	Sea Approach (paired with 290.900 MHz)
128.200	Final Approach – Civilian
139.925	Final Approach <Primary>
239.000	Final Approach
290.900	Sea Approach (paired with 120.100 MHz)
317.400	Final Approach

Hartsfield-Jackson Atlanta International (KATL)
133.425	Runway 10 and 28 ILS (ex-136.150 MHz)

Hurlburt Field, FL (KHRT)
351.675	Tower Local Control (ex-291.100 MHz)

Lakehurst NAES/Maxwell Field, NJ (KNEL)
307.025	Ground Control (New)

McCarran International, NV (KLAS)
125.900	Las Vegas Approach (ex-133.950 MHz)
307.250	Las Vegas Approach (ex-353.700 MHz)

Los Alamitos AAF, NM (KSLI)
118.875	ATIS (New)
379.975	ATIS (New)

Luke AFB, AZ (KLUF)
306.950	Clearance Delivery (ex-363.125 MHz)
363.125	Approach Control-North <Channel 5> paired with 118.150 MHz

Marshall AAF, KS (KFRI)
139.000	Base Operations Flight Following <Primary>
247.000	Base Operations Flight Following

Mayport NS, FL (KNRB)
267.600	ATIS (ex-268.600 MHz)

Mountain Home AFB, ID (KMUO)
285.650	Clearance Delivery (ex-373.000 MHz)

Pensacola NAS/Forrest Sherman Field (KNPA)
124.350	Clearance Delivery (New)

Randolph AFB, TX (KRND)
290.525	Randolph ATIS (New)
271.800	Hangover ATIS (New)

Seattle ARTCC (KZSE)
134.950	Badger Mountain, WA RCAG Low/High Discrete
270.300	Badger Mountain, WA RCAG Low/High Discrete
353.900	Badger Mountain, WA RCAG Low/High Discrete

Tallahassee Regional, FL (KTLH)
128.625	RCAG (ex-135.325 MHz)

Tonopah Test Range, NV (KTNX)
257.950	Tower (New)
335.500	Ground Control (New)

Travis AFB, CA (KSUU)
239.050	Ground Control (New)

USAF Academy Airstrip, CO (KAFF)
121.950	VHF PMSV Metro (no longer used)
134.100	VHF West Tower (ex-121.250 MHz)
376.000	UHF PMSV Metro (in service)

Vagabond AAF, WA (KFCT)
30.025	Rattlesnake VHF-Low frequency
139.700	CTAF frequency
363.250	Rattlesnake UHF frequency (ex-379.100 MHz)

Webster NOLF (St. Inigoes) (KNUI)
360.250	Secondary (ex-315.500 MHz)

Yuma MCAS/Yuma International, AZ (KYUM)
281.000	Departure Control <Primary>
374.000	Approach Control <Primary>

Yuma Proving Ground, AZ (KLGF)
125.550	Approach/Departure Control (no longer used)

And that does it for this edition of MT's Milcom column. Until next time, 73 and good hunting.

FED FILES

GOVERNMENT COMMUNICATIONS

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Washington DC – Federal Scanning Wonderland

Over the years that I have been able to travel across the country for work and bring my scanners with me, I have made several short trips through the nation's capital, Washington DC. This past June I was fortunate enough to have some spare time on one of these trips and decided to do some "serious" searching and scanning of the area.

This is one of these special places that scanner nuts just dream about. There is, realistically, almost too much to try and listen to at any one time! It seems that nearly every federal frequency allocation between 162 to 174 MHz has someone in the Washington DC area or nearby using it. The 406 to 420 MHz band is also filled with conventional and trunked systems all over the Maryland, Virginia, and the DC area. And to top all that off, the military land-mobile bands of 138-144 MHz, 148-150.75 MHz and 380 – 390 MHz were also hopping with activity. And who could overlook the military UHF aircraft operations in the area? All I can say is "Wow!"

Clearly, this trip was going to require some additional equipment, just as my trip earlier in the year to the Super Bowl in Miami. I again brought along my usual road radios, the PRO-96, 396 and 996 scanners. I also brought my Yupi-teru MVT-7100 and my Sporty's JT-100 air band scanner. The Optoelectronics OptoCom receiver and laptop computer rounded out the gear.

Besides setting up automatic logging and recording at the hotel room base of operations, I also went mobile and did my best to search, scan and listen while driving. So what did I hear while in Washington? The log list is long, so I decided to try and break it up by agency:

US CAPITOL POLICE

Freq MHz	Hz	Chan/Use
169.2250	110.9	F1 /F6
165.5375	146.2	F2 /F7
170.1750	156.7	F3 /F8
162.2500	173.8	F4/F9 - Security Details with motorcade ops
162.6125	127.3	F5/F10

I also copied some of the Capitol Police channels with alternate PI tones. These could be alternate repeaters or simplex use.

165.5375	118.8	
169.2250	156.7	
170.1750	107.2	

NATIONAL PARKS SERVICE

172.4750	P-25	NPS National Capitol Area - Parks Control?
166.7250	127.3	NPS US Park Police F1/F6
166.9250	127.3	NPS US Park Police F2/F7
167.0750	127.3	NPS US Park Police F3/F8
166.8500		NPS US Park Police F4

JUSTICE DEPARTMENT

418.9500	P-25	DEA
167.2125	167.9	FBI
167.3625	167.9	FBI – This may be a repeater near National Cathedral. I got a "Close Call" trigger on this frequency while driving near there.
167.3875	167.9	FBI
167.4125	167.9	FBI - Clear surveillance operation heard over several days. May be called channel B7 or B8.
167.4625	167.9	FBI
167.4875	167.9	FBI
163.2000	136.5	US Marshals

DEPARTMENT OF HOMELAND SECURITY

165.2375	100.0	DHS CBP Net 1
166.4625	CSQ	DHS Common
169.4500	100.0	DHS CBP
415.2000	P-25	DHS Federal Protective Service

US SECRET SERVICE

162.0750	P-25	USSS UD (Uniformed Division) WH 1 [169.9375 in]
162.3125	P-25	USSS UD Foreign Missions 1 [171.7625 in]
163.0000	P-25	USSS
163.3125	P-25	USSS UD WH 2 [170.4375 in]
164.1000	P-25	USSS UD K-9 units
164.4000	P-25	USSS PAPA
164.4375	P-25	USSS UD Foreign Missions 2 [172.5625 in]
164.6500	P-25	USSS TANGO
164.8875	P-25	USSS OSCAR
165.2125	P-25	USSS MIKE
165.3750	P-25	USSS CHARLIE
165.4125	P-25	USSS ?
165.7875	P-25	USSS BAKER - Clear P25!
166.2000	P-25	USSS UD VP Residence
166.7000	P-25	WHCA NOVEMBER
167.0125	P-25	USSS VP Details
167.0375	P-25	USSS POTUS Details
167.9000	P-25	USSS
170.0000	P-25	USSS UD Admin / USSS Common
170.9875	P-25	USSS UD Foreign Missions 3 [Simplex]

MISCELLANEOUS AND UNKNOWN AGENCIES

164.9125	127.3	National Arboretum
406.3875		Unknown agency
406.5625	P-25	Unknown agency
407.6000	P-25	State Department Diplomatic Security Service
407.7750	P-25	US Postal Inspectors
407.8625	P-25	Unknown agency – clear / encrypted
408.1250		Library of Congress – security repeater
408.5125	P-25	Unknown agency, mentioned Federal Protective Service
408.6000	P-25	State Department Diplomatic Security Service
408.8875	P-25	Unknown agency
409.0375	P-25	Unknown agency
409.5125	D073	Unknown agency – analog repeater
409.7125	P-25	Unknown agency
409.9000		Paging data
410.1750		Unknown agency
410.6500		Unknown LTR system?
410.8250	D631	Unknown agency – analog repeater
410.9375	P-25	Unknown agency
411.5500	210.7	National Gallery of Art
411.9500		Unknown agency – analog
413.4500		Unknown agency – analog
414.7500	P-25	US Postal Inspectors
415.2250	156.7	Unknown agency – analog repeater
416.1500		Architect of the Capitol Alert System, "This is only a test…"
417.8875	P-25	Unknown agency
419.2500		Unknown agency – sounded like DES encryption

❖ Federal Trunk Systems

Besides the conventional radio systems in the DC area, there are quite a few federal trunk systems in operation. The first trunk systems in the DC area belonged to Department of Defense operations. In the last year, much of the DoD operations have begun to move off the 400 MHz trunk systems to the new DoD 380 MHz P-25 trunk systems.

There are several trunk systems for various federal agencies and facilities that are using the LTR Passport flavor of trunking. These systems cannot be tracked with the current models of scanners, but you can listen to them conventionally.

John F. Kennedy Center for the Performing Arts
LTR Passport Trunk System
  408.45000

Smithsonian Institution (National Zoo)
LTR Passport Trunk System
  408.45000
  409.42500

Washington DC Area Federal
LTR Passport Trunk System
<u>National Mall</u>
  407.0750
  407.3750
  408.5500
  408.8750
  410.3125
<u>Udvar-Hazy Center</u> (Dulles Airport)
  406.5875
  409.8500
  410.9625
<u>Unknown</u> Location or Facility
  406.5875
  409.8500
  410.9625
<u>Unknown</u> Location or Facility
  406.1625
  409.8875
  410.6625

Some additional federal systems are Motorola Type II UHF trunking. Some are analog and some are using P-25 digital voice. This system was operated by the <u>National Telecommunications and Information Administration</u> (more on them later) as a "catch-all" for various federal agencies and may have been a temporary solution, as the system has very little traffic on it these days:

Motorola System ID - 4e00 - Analog
  406.10000
  406.25000
  406.75000
  406.85000
  408.70000
  408.90000
  409.75000
  410.37500

This trunked system is widely believed to belong to the <u>National Institutes of Health</u> at various locations:

Motorola System ID – 4732 - Analog
  409.0000
  410.2250
  410.4250
  411.4500
  411.8250
  413.4500

This system was reported at one time to be part of the National Institutes of Health in Maryland, but today it seems to have few users. The one transmission I caught from this system referred to someone at the <u>Federal Trade Commission</u>, possibly security at the FTC:

Motorola System ID - bc0a - Analog
  406.4000
  409.2375
  409.5000
  409.8625
  410.1000
  410.6250

Many of the frequencies that were formerly used in the military's National Capitol District 400 MHz trunk systems are now being integrated into a new, multi-site trunk system. This new system is reported by some sources to be a wide-area system for use by the <u>Department of Homeland Security</u>. So far not much is known for sure about this system or its users, as most radios are using encryption:

Motorola System ID - a73b – P-25 digital voice
  406.11250, 406.36250, 406.52500,
  406.77500, 406.92500, 407.08750,
  407.23750, 407.41250, 407.56250,
  407.71250, 407.88750, 408.08750,
  408.26250, 408.42500, 408.57500,
  408.73750, 408.91250, 409.11250,
  409.27500, 409.47500, 409.63750,
  409.91250, 410.28750, 410.56250,
  410.76250

That's all I was able to log with the computer or write down while listening. I'm sure there were some that were missed and I'm sure the folks who live and monitor the Washington DC area full time can add to or correct the information that I have provided.

❖ Encryption

Many of the radio transmissions I monitored while in Washington DC were encrypted. As was expected, almost all the Secret Service frequencies were scrambled, but occasional clear traffic was heard, so don't give up. (Besides, I'm in it for the hunt for any active frequencies!) Clear traffic was also heard on the Federal Protective Service and FBI frequencies as well. But some of the UHF trunk systems using P-25 digital voice seemed to be using encryption on many, if not all the radios.

Remember that frequencies are not encrypted, talk-groups are not encrypted, systems are not encrypted – but individual radios are encrypted.

Encryption is much more "user-friendly" now than it has previously been. Users of digital radios, who are now getting used to the sound of the digitally processed speech, are not even aware of when a transmission is encrypted and when it's not. Some agencies have reportedly programmed the encryption to be turned on when any channel is selected automatically, so the chances of someone forgetting to "go secure" are much less likely.

❖ Fed Files Myths and Legends:

Feds can operate wherever they want

One myth that continues to be spread by scanner listeners across the Internet is that federal agencies can use any frequency they want to transmit on. It may appear that way sometimes, as the FCC does not license federal frequencies, but federal agencies are assigned frequencies by a different government agency, the National Telecommunications and Information Administration or NTIA (**www.ntia.doc.gov/**).

Part of the Commerce Department, the NTIA maintains all of the federal radio spectrum information in what is called the Government Master File, or GMF. This information is not available to the public any more, so that is why we federal monitors have to build our own databases of information from listener reports and personal logs.

Federal agencies cannot simply pick and use frequencies at random. Even though the FCC does not license them, they still must have authority to operate on assigned frequencies by the NTIA. The NTIA coordinates frequency requests from all federal agencies and makes sure agencies won't interfere with each other or existing users. The NTIA Office of Spectrum Management issues licenses, tracks down interference problems and complaints, and even issues citations for violating the rules.

Federal stations are issued call signs similar to FCC call signs, although federal stations are not required to broadcast those call signs. Some agencies, particularly US Forest Service stations, do use their NTIA call signs when transmitting. Many FBI offices use their NTIA call signs to identify themselves when calling agents in the field.

I have seen some frequency lists that report various federal agencies operating on frequencies between 138 and 150 MHz. This spectrum is under the control of the Department of Defense and would not normally be available for assignments to non-military federal operations. One listener reported that over a period of time years ago there was an ongoing surveillance operation on a 150 MHz channel that they presumed to be the DEA, due to some of the names and unit numbers being passed over the air.

If it really was the DEA, they could have been working along with some military investigative branch and they decided to utilize the military agency's VHF working frequencies for the operation. Or, perhaps the suspect in the case was wise to the DEA's UHF nationwide operating frequencies, and they decided to try and keep their communications out of the spotlight. In either case, the DEA would not have simply picked these frequencies out of the air and started using them on their own. It would require coordination between the DEA, NTIA and the DoD Spectrum Management Bureau.

So, what about federal agencies using local radio systems? Yes, they can and do use local public safety trunk systems sometimes, but they just don't show up there on their own. There will be a letter of agreement on file between whatever federal agencies are requesting space on the local system and the system operator. It will spell out the agreement for use and any restrictions or costs involved in using the system. The same goes for state police frequencies and radio systems. Often states will set aside special call signs or unit numbers for federal agencies to use.

That is all for this installment of the *Fed Files*, but we will be back in November!

Denver, the Rockies, and Repeaters

Last time, we looked at the Powder River Basin (PRB) in Wyoming, and I listed some BNSF and Union Pacific frequencies used both in the PRB and in the Denver area.

My trips to and from the PRB have always been through Denver. Denver has the largest airport in that part of the country and therefore offers the widest range of rental vehicles. The Denver area itself (and nearby parts of Colorado) have much to offer to those interested in rail transportation and listening in on railroad operations.

Therefore, I usually plan at least a day at the beginning or end of the trip for locations in Colorado.

❖ Golden as a base

My overnight stays in the Denver region have usually been in nearby Golden, rather than downtown, both because motels are less expensive there and because that town provides convenient access to other sites that I'm interested in. Golden, best known for its huge Coors brewery – a major source of rail traffic, though the large yard at the brewery is fenced in – is also the home of the Colorado Railroad Museum, not far from the brewery.

(Coors plant switchers use the industrial UHF frequencies of 467.475 and 462.475, not standard AAR frequencies.)

The museum is worth a stop because of its strong collection focusing on Colorado narrow gauge and mountain railroading.

The same eastbound Union Pacific train described above in a more wide-angle view. The loaded coal train from the Craig Branch in western Colorado has additional sets of locomotives in mid-train and at the end, all of which will help in dynamic braking on the way down to Denver.

But one of my favorite parts of the area is further west, the Moffat Route's twisting climb to the 6.8-mile long Moffat Tunnel which gets trains through the Front Range of the Rocky Mountains. The East Portal of the tunnel (a named location on the railroad) is 9,239 feet above sea level, almost a mile higher than the mile-high city. And the tunnel replaces an even more tortuous route that initially went over the mountains.

East Portal can be reached via a reasonably good, though unpaved road, with a four-wheel drive vehicle suggested, though not absolutely necessary in dry weather.

❖ Moffat Tunnel

Besides its altitude and length, the tunnel has several other noteworthy features. The East Portal is equipped with a vertical metal door (also called the "curtain") and a huge assembly of giant fans used to drive exhaust fumes from the tunnel. When the fans are running, you can hear the roar up to a mile away.

After a westbound train has passed, the door is closed and fresh air forced in behind the door to vent fumes out the other end of the tunnel. It takes about half an hour to clear exhaust fumes, so the tunnel is a major choke point, allowing the passage of at most one train per half hour.

For eastbound trains, the fans are turned on as soon as the train has entered the west portal near Winter Park. The door remains closed until the train is very close, then opened for it to emerge.

There are both signals and defect detectors inside the tunnel. The signals are interlocked with the door, so that a train will not run into the closed door.

On that busy route, that leads to all sorts of dispatching challenges, all of which can be heard on a scanner. You'll see meets between trains exiting the tunnel and trains waiting to go through the tunnel.

The tunnel also has a repeater antenna running its full length, so that even outside the portal, you can clearly hear transmissions from within the tunnel.

Again, I'll put in plug for
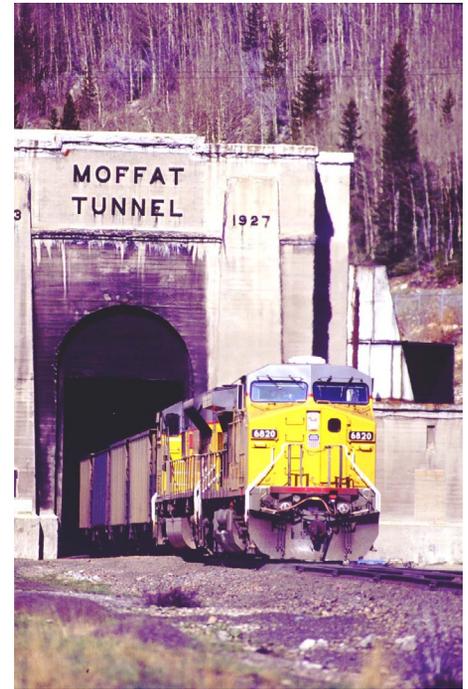
An eastbound Union Pacific train exits the East Portal of the Moffat Tunnel and begins its descent toward Denver. In this May 1999 photo, there are still patches of snow on the ground and yes, those are huge icicles on the tunnel portal.

the applicable Altamont Press railfan timetable, in this case the *Rocky Mountain Region Timetable*, covering Colorado, Utah, and Nevada. Edition 7 was published in 2005. If you don't purchase one before getting to Colorado, you can pick up a copy at the Colorado Railroad Museum's shop in Golden or at Denver area rail hobby shops.

The timetable includes a good map of the route from downtown Denver – Denver Union Station is milepost 0; East Portal is at milepost 50.1, though the air distance from Denver is much less. The map includes the key roads that will get you to East Portal.

On the Moffat Route, now owned by Union Pacific, you'll see trains from UP (most of the traffic), Amtrak (The California Zephyr [CZ] in both directions), and BNSF. BNSF has trackage rights on the route and runs a small number of through freights. (The Grande Luxe excursion trains – formerly known as the American Orient Express – also show up on this route from time to time, usually scheduled to run immediately

behind the California Zephyr.) Under a new agreement between GrandLuxe and Amtrak, some runs of the CZ in late 2007 and early 2008 will have GrandLuxe cars tacked on the back, rather than operating as a separate train. (For details, see **www.grandluxerail.com**.)

It takes a lot of horsepower to get trains up the twisting route from Denver. Trains move slowly, usually making it possible to see or photograph them at one location and then to get ahead by road to another location on the line – not to mention that there are frequent meets during busy times.

Eastbound loaded coal trains originating on the Craig Branch in western Colorado will usually have three sets of engines. Supplementing the head-end power, remote-controlled units appear at mid-train and at the end.

In addition to the repeaters handling communications inside the tunnel, UP also uses some mountaintop UHF repeaters. If you program these into your scanner, you can often hear trains on those frequencies when the normal AAR channels which serve as input and output for the repeaters are blocked by the terrain.

PBX frequencies in use on the line are AAR 12 and 33 on the east side of the tunnel.

If you have more time, you may also want to consider a trip to the west side of the Moffat Route, including scenic Gore Canyon, which I described in a feature in the September 2004 issue of *Railfan & Railroad* magazine. However, you cannot easily get by car from East Portal to the west slope. For that, you have to return to westbound Interstate 70 near Golden and then proceed westbound through the Eisenhower Tunnel.

That route takes you past the Georgetown Loop Railroad, a surviving remnant of a mountain narrow gauge line with seasonal operations. The Georgetown Loop uses AAR channel 21/21 (160.425) for operations and AAR channel 67/67 (1161.115) for administrative activities.

❖ Radio discipline

The military calls it "radio discipline" – adherence to the rules governing the use of radios. Messages are supposed to follow a particular format and non-business radio messages theoretically aren't allowed.

Railroads have similar rules. Radios exist to conduct railroad business. Every message should include the identity of the sender and the identity of the recipient in some unambiguous format.

Consider, for example, the situation where several trains are switching in a yard, all using the same frequency. If someone transmits "Back up four cars" without proper identification and the wrong train reacts, disaster could result.

Private exchanges are prohibited, but railroads enforce that rule only to a degree. When two trains meet at a siding in an area with little rail traffic, it's not unusual for the crews to exchange pleasantries if they know one another, which they usually do. And even the strictest supervisors don't worry about that.

But, sometimes the most interesting conversations you hear on railroad frequencies are ones that don't really belong there.

To me, one of the most puzzling – at least initially – was one I heard many years ago on

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A westbound BNSF trackage rights train on the west slope of the Moffat Route, descending through Gore Canyon, whose stark rocky terrain has often been compared to lunar landscapes. On this Union Pacific route, the BNSF train of course uses UP radio frequencies to communicate with other trains and the dispatcher.

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the former Clinchfield Railroad (now part of CSX) on the line that crosses the Blue Ridge Mountains in far western North Carolina. It went something like this:

Conductor (in the caboose): "11-9. Over."
Engineer: "11-9. Out."
Conductor: "13-11. Over."
Engineer: "13-11. Out."

The numbers kept changing. At first I thought the railroad had initiated some new type of code, such as the 10- system that police forces use. It wasn't until I heard a message like this that I finally figured out what was going on:

Conductor: "Tennessee has taken the lead. 37-34. Over."

The conductor had a personal transistor radio in the caboose and was listening to a basketball game on a slow Saturday afternoon – and relaying the scores to the engineer. It wasn't exactly railroad business, but then there probably weren't any supervisors around to complain.

❖ Same words, different meaning

After submitting the previous column, I had an interesting e-mail discussion with Managing Editor Rachel Baughn about how some words such as "signal" and "traffic" can have different meanings in the contexts of railroads and radio.

In the railroad world, "signal" usually means a visual lineside device from a traffic control system that displays one of several aspects telling trains to proceed, slow down, or stop. In the radio world, "signal" is the electromagnetic output of a radio transmitter.

"Traffic" to railroaders describes the number of trains on a line. To those in the radio world, "traffic" is the number of radio messages.

"Line" can either mean a railroad route or a physical wire circuit running along that railroad route.

Just to make things more interesting, in today's world, radio signals are being increasingly used to operate railroad lineside signals. Look at older photos and you'll find lineside poles with perhaps dozens of wires. These wires, in addition to carrying one or more circuits of

the railroad's internal telephone system, mostly served as "code lines" – circuits that controlled the aspects displayed by signals and which reported track occupancy and switch positions back to the traffic control system.

Having up to thousands of miles of wire at trackside left railroads vulnerable to both the elements and thieves stealing the copper wires.

Today, the railroad's internal telephone calls most likely go through a fiber optic cable that is buried along the right of way. Instructions to signals and the reporting of track occupancy and switch positions are handled by digital radio messages. In most cases, you'll find next to most railroad signal locations a small metal housing for equipment supporting the signal system. And, an antenna will be nearby.

Equipment in the lineside metal boxes, sometimes called "bungalows" by railroad personnel, also processes track occupancy status and switch positions and sends that back by radio. The field equipment at the CTC (centralized traffic control) signal locations may communicate directly with a nearby larger base station tied into the traffic control system. That base station then communicates with the dispatching center either through fiber optic or microwave circuits. Or, the data can be relayed from bungalow to bungalow up and down the railroad route from a main point that is tied into the railroad's traffic control system.

Needless to say, the use of common terms that can mean different things in the railroad and radio world can be confusing to those interested in both railroads and radio. I'll try to be more aware of possible points of confusion and will try to make sure there is adequate context to show which meaning of a term is applicable.

Next time: Traveling on passenger trains with a scanner.

LF Receiving Antennas: Loops

Multi-turn Tuned Loops are another design worth discussing in this two-part series on LF receiving antennas. (Last month we covered random wire and ferrite loop antennas.) Multi-turn, tuned loops usually consist of a box-shaped frame wound with several turns of small diameter wire. The windings are tuned to resonance at LF with a variable capacitor connected across the windings. A separate, one-turn winding is placed in the middle of the tuned winding to provide a low impedance (50-100 ohm) "pickup link" used to feed the receiver via a coaxial cable.

Multi-turn loops are easy to build, and you can get plans for one by ordering a back issue of the September '92 edition of *Below 500 kHz* from *Monitoring Times* – cost $3. (An optional preamp for this loop was published in the November '93 column.) Such a loop can be set on a tabletop and rotated to favor (or null) a particular signal. One *MT* reader I spoke with mounted his loop on an old music stand and is achieving excellent results.

A disadvantage of tuned loops is that they must typically be used indoors. Most designs are too fragile to mount outside in the wind, and even if you did, there is the problem of tuning. Whenever you move more than 10 kHz or so, the loop should be re-tuned for maximum performance. It is possible to employ remote tuning, but the arrangement can become very complicated. The good news is that these loops seem to perform very well indoors!
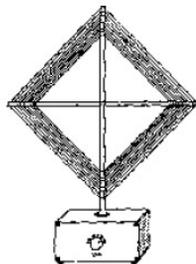
Finally, let's discuss **Broadband Shielded Loops**. These antennas have a number of advantages that make them popular with DXers – among them: low noise pickup, good sensitivity, tune-free operation and mechanical stability.

Shielded loops contain only one turn of wire, and, as the name indicates, they are electrically shielded, except for a very small portion (an inch or so) at the top of the loop circle. Shielding causes the loop to respond principally to the magnetic component of an incoming electromagnetic (RF) signal and reduces its susceptibility to electrical field noise.

Shielded loops typically contain a wideband (10-500 kHz) preamplifier, so there's no need for tuning the antenna as you move across the band. In a well-designed loop, the preamp begins "rolling off" above 400 kHz and becomes nearly "deaf" above 500 kHz. In this way, problems with AM broadcast overload are minimized.

Finally, shielded loops are made of a rigid or semi-rigid material such as copper pipe or "hardline" coax, so they can be easily mounted outdoors on a simple mast and turned with a TV rotor.

Would you like to build a shielded loop? If so, I highly recommend visiting VE3OT's web site at **http://technology.fanshawec.ca/eltn124/loops.htm**. Here, you'll find information for building several types of high performance loops. I'm currently building one of these myself.

An excellent general reference on loop antennas is Joe Carr's *Loop Antenna Handbook*, available from Universal Radio Research, 6830 Americana Parkway, Reynoldsburg, OH 43068. It contains over 130 pages of descriptions, plans and theory for many types of loop antennas.

❖ Loggings

As some of you may already know, I recently began serving as editor of the *DX Downstairs* column for the Longwave Club of America's *Lowdown* journal (see **www.lwca.org**). For years I have wanted to give something back to this respected publication, which has done so much to promote the longwave hobby since 1974. When the need for a column editor came up, I thought this would be one way in which I could contribute.

The *DX Downstairs* column is mainly devoted to reader loggings. To streamline the process and present the most interesting information, I plan to cross-post many of the logs I receive here, in the *DX Downstairs* column as well, and vice versa. If you object to your logs appearing in another venue, please let me know when you submit them and your wishes will be respected.

This month's loggings are provided courtesy of Lenroy Hogan (NY), Richard Palmer (AZ), Brent Taylor (PE), and Ken Reitz (VA) All contributors are identified by their initials and location in the list below.

Selected LF Loggings

FREQ	ID	ST/ITU*	CITY	BY
198	DIW	NC	Dixon	KR-VA
206	QI	NS	Yarmouth	LH-NY
209	IB	ON	Atikokan	RP-AZ
214	CHX	MEX	Choix, Sinaloa	RP-AZ
216	CLB	NC	Carolina Beach	KR-VA, LH-NY
218	YUY	QC	Rouyn	LH-NY
219	GAV	AK	Gustavus	RP-AZ
220	BX	QC	Blanc Sablon	LH-NY
221	9A	AB	Hanna	RP-AZ
222	CUW	MEX	Chihuahua	RP-AZ
224	QM	NB	Moncton	BT-PE
233	ALJ	AK	Johnstone Point	RP-AZ
239	VO	QC	Val D'or	LH-NY
243	YVB	QC	Bonaventure	LH-NY
244	DG	QC	Chute Des Passes	LH-NY
248	UL	QC	Montreal	LH-NY
254	5B	PE	Summerside	BT-PE, LH-NY
257	YXR	ON	Earlton	LH-NY
260	NF	NFK	Norfolk Island	RP-AZ
260	YAT	ON	Wapisk	LH-NY
263	QY	NS	Sydney	BT-PE, LH-NY
270	FA	SMO	Upolo	RP-AZ
273	ZV	QC	Sept Iles	LH-NY
276	YHR	QC	Chevery	BT-PE, LH-NY
278	NM	QC	Matagami	LH-NY
280	IPA	PAQ	Easter Island	RP-AZ
283	DUT	AK	Dutch Harbor	RP-AZ
289	YLQ	QC	La Tuque	LH-NY
300	Q5	AB	Grande Cache	RP-AZ
302	XY	YT	Whitehorse	RP-AZ
303	YPP	QC	Parent	LH-NY
304	ZQM	NB	Riverview	BT-PE
323	UWP	NL	Argentia	LH-NY
326	FC	NB	Fredericton	BT-PE, LH-NY
332	POA	HI	Pahoa	RP-AZ
332	YFM	QC	La Grande	LH-NY
335	CC	CA	Concord	RP-AZ
335	YLD	ON	Chapleau	LH-NY
338	5Y	NS	Trenton	BT-PE
340	YY	QC	Mont Joli	LH-NY
341	DB	YT	Burwash Landing	RP-AZ
347	YG	PE	Charlottetown	BT-PE
350	DF	NL	Deer Lake	LH-NY
353	NH	MAR	Nuku Hiva	RP-AZ
360	PN	QC	Port Menier	BT-PE
366	YMW	QC	Maniwaki	KR-VA, LH-NY
366	ZMN	NB	Lewisville	BT-PE
370	GR	QC	Grindstone	BT-PE
375	FS	NT	Fort Simpson	RP-AZ
378	RJ	QC	Roberval	LH-NY
385	NA	QC	Natashquan	BT-PE
390	JT	NL	Stephenville	BT-PE
391	DDP	PR	San Juan	KR-VA, RP-AZ
395	XEN	OH	Xenia	KR-VA
397	ZHM	ON	Hamilton	KR-VA
400	ENS	MEX	Ensenada	RP-AZ
400	ZYG	PE	Cavendish	BT-PE
404	CKI	SC	Kingstree	KR-VA
407	CHD	AZ	Chandler	KR-VA
415	CBC	CYM	Cayman Brac	RP-AZ
419	RYS	MI	Grosse Ill	KR-VA
432	IZN	NC	Lincolnton	KR-VA

** For a list of ITU codes, see **www.wordiq.com/definition/ITU_letter_codes***

Cuban Spies Convicted

Alan Lutens forwards the link to a press release from the FBI from February 27, which largely escaped the notice of shortwave radio monitors. You can see the release for yourself at **http://miami.fbi.gov/dojpressrel/press-rel07/mm20070227.htm** Former Professor Carlos Alvarez of Florida International University was sentenced to 60 months in prison and his wife Elsa Alvarez received 36 months in prison after their convictions on charges that they were spies for Cuba between 1977 and 2005. The FBI said in this release,

"The electronic communications involved shortwave radio messages from the Cuban Intelligence Service, which Carlos Alvarez decrypted using a computer disk. Carlos Alvarez then gathered the requested information and compiled written reports, which he encrypted using another computer disk. Carlos Alvarez signed these reports with his codename, 'David.' Carlos Alvarez mailed these reports to various post office boxes in New York, and then burned in his backyard, and attempted to erase on his computer, evidence that the reports had been written.

"On occasion, Carlos Alvarez received new decryption and encryption computer disks from the Cuban Intelligence Service to ensure that the communications would remain secret. When Carlos Alvarez picked up the new computer disks, he sometimes transported them hidden in a portfolio or briefcase with a false compartment. Carlos Alvarez and his coconspirators ceased to communicate in this manner in or about 1998, after the arrest of the Wasp Spy Network in South Florida.

"Carlos Alvarez communicated with his coconspirators through personal meetings in Cuba and elsewhere. To this end, Alvarez's position as an educator at Florida International University enabled him to meet individuals on whom the Cuban Intelligence Service wanted information and to travel to Cuba to communicate his information."

This release from the FBI represents a clear description of the mechanism by which some of the "spy numbers" broadcasts on shortwave radio are utilized.

❖ Pirate Station Web Sites

DIY media operates a web site that contains an interesting collection of web sites operated by pirate stations, both on shortwave, medium wave, and FM. You can check out this interesting site at **www.diymedia.net/links/lstaus.htm**

Another very interesting site operated by veteran DXer Chris Smolinski's Black Cat Systems web site contains a lengthy list of maildrop addresses used by various pirate broadcasters.

You can find that one at **www.blackcatsystems.com/pirate/stations/**

❖ British MPs Protest Police and Pirates

Several British members of Parliament, including Lynne Featherstone, member of Parliament in the northern London district of Hornsey Wood Green, have questioned Crimestoppers, a police advocacy organization in the UK. Allegedly, British pirate Bizm FM has been running ads for Crimestoppers. Featherstone started the protest after complaints from London Turkish Radio, a licensed Turkish language radio station in London. Crimestoppers has denied purchasing the ads on the Bizm FM pirate. Crimestoppers also asked Bizm FM to stop airing the ads, and they asked OFCOM (the British FCC) to investigate.

❖ Ethiopian Clandestine

Brend Trutenau, via BBCMS and DXplorer, points out that The Ethiopian People Patriotic Front (EPPF) claims to have started a weekly quasi-clandestine broadcast to Ethiopia on 7 June. With an ID of "Ye Arbenyoch Dimts" [The Voice of Patriots], their announced schedule is on Thursdays for an hour at 1600 UTC on 15260 kHz. Has anybody been hearing this new transmission? It could be audible in North America on this frequency.

❖ West Bank Pirate

The BBC reported in June that pirate radio rose to the attention of the Israeli cabinet. A Palestinian pirate station on the West Bank was interfering at times with radio communications at Ben Gurion International Airport. Israeli communications minister Ariel Attias said that he was taking steps to "eradicate" pirate radio stations. He claimed to have shut down fifty pirate stations this year. Some flights at the airport had been delayed as a precaution until the pirate was busted.

❖ Holidays

There are two major pirate holidays this month. Labor Day in the United States is one. The novelty "Talk Like A Pirate Day" is the second, set for September 19 this year. The former always leads to increased shortwave pirate activity. The latter has hit the mainstream press, and is likely to impact programming on commercial radio and television. They have a web site at **www.wikihow.com/Talk-Like-a-Pirate**

❖ What We Are Hearing

Monitoring Times readers heard two dozen different pirate radio stations once again this month, despite high static levels during the summer. You can hear them, too, if you use some simple techniques. Pirate radio stations never use regularly announced schedules, but shortwave pirate broadcasting increases noticeably on weekends and major holidays such as Labor Day. You sometimes have to tune your dial up and down through the pirate radio band to find the stations, but more than 95% of all North American shortwave pirate broadcasts are heard on **6925 kHz**, plus or minus 30 or 40 kHz.

Back Door Show- Somebody has been playing classic rock music by The Doors with an ID or slogan "Back Door Show." (None)

Captain Morgan- This captain programs rock music and audio from the old *Twilight Zone* TV show. (None, says to send loggings to the Free Radio Network web site)

Chicken Radio- This new one has an intense focus on chickens, what else? They play chicken songs and they feature an ad for a movie called "Electric Amish Armageddon." (None)

Grasscutter Radio- Classic rock music is the fare heard here. They seldom discuss cutting grass. (grasscutterradio@yahoo.com)

Ground Zero Radio- Their format is mostly rock, Burt the Turtle's old civil defense propaganda film "duck and cover" is often heard among the rock tunes on this pirate. (Announces defunct Elkhorn, but also uses gzrsw@yahoo.com)

MAC Shortwave- Paul Star has one of the best replicas of the old top 40 AM hit format ever produced. He still uses variable frequencies such as 3275, 6850, and 6925 kHz. (macshortwave@yahoo.com)

Northwoods Radio- Their distinctive "loon call" interval signal precedes their rock music "from the Great Lakes." Recently they transmitted a genre theme show of ballads. (northwoodsradio@yahoo.com)

Radio Cricket- Here's another new one that we don't know much about yet. Classic rock is their format, and they include a news segment. (Unknown)

Radio Free Euphoria- Captain Ganja's veteran marijuana advocacy station is operated by a self-described "aging hippie." (Belfast)

Radio First Termer- This documentary about radio shows broadcast to USA troops during the Vietnam war still appears from time to time on the pirate bands. (None)

Radio Jamba International- This new station features novelty tunes and news parodies. The Kracker Radio web site at www.krackerradio.bravehost.com/ suggests that this one may be associated with **Kracker Radio**. (none)

Radio Mosiach & Redemption- Also sometimes known as Lubivitcher Radio, this ultraconservative Jewish religious pirate showed up again this month on 1710 kHz. Their web site at www.radiomoshiach.org/, still announces future plans for shortwave, FM, and "other broadcast methods." (None announced, but the web site accepts financial donations)

Radio 6X- They are a relatively new rock oldies pirate, and they have sent out more than one broadcast.

The Ham as Scannist

Not too long ago, the editorial staff of *MT* forwarded me an e-mail from Jon KF7YN asking, "Since you are one of the original Scanner Scum (**www.scannerscum.com**), will you be doing any scanning articles?" Our Managing Editor Rachel KE4OPD added, "I'd like to hear the answer to his question, too!" Point taken: I hear and obey.

True enough, I have written quite a bit about scanning when I was the *Beginner's Corner* Contributing Editor for *MT*. I have touched on how scanning can augment ham activity, especially in emergency operations in *On the Ham Bands* columns in the past. I have also written for a number of club and commercial publications related to scanning over the years. But I guess it wouldn't hurt to unpack the subject again, given changes in technology and practice on both the amateur and VHF/UHF public service bands.

You don't have to go all that far back in the world of ham and scanner activity to remember the days when you could slap half a dozen crystals (remember crystals?) into a Bearcat III or IV and have all the information about the local environment that a ham or scannist could ever desire. Times have changed, folks! There are still a few places around the country where such a set-up would do you well, but most places, especially those subject to urban and suburban sprawl, require dozens, perhaps even hundreds of frequencies to stay on top of anything going on in your region. Further, since those dark days in September six short years ago, interagency cooperation and emergency planning for both hams and public servants have made the task of VHF/UHF monitoring a much more complex task.

Let's take a look at how any ham might go about using scanning to enhance amateur radio.

❖ Know Thyself

In my own ham shack, at any given time, I have at least two scanning receivers going, keeping track of the world around me. Sure, part of this is because I am, as Jon KF7YN points out, a somewhat noted scannist (sez so right on the web site) , but I see similar set-ups in most ham shacks where the OM or YL is involved in local Amateur Radio Emergency Service (ARES) and Radio Amateur Civil Emergency Service (RACES) activities.

Begin your decisions about blending amateur radio and scanning activities by looking at how you plan to get involved. For example, if you are mainly a ragchewing ham who talks on 2 meters to and from work, your main interest might simply be a bit more information about road conditions than you are likely to get in the 15 second blurb you hear on your local news broadcast station. You would be looking for whatever local public service, mainly police and roads departments would have to offer. You might also tune local fire stations as their missions can block transportation routes.

If you are more involved in assisting your local emergency management operations through your area RACES, ARES, or Skywarn organizations, you will want to touch base with the local hams and leadership to find out what specific frequencies they would want you to monitor to aid in operations.

I have become more involved in outdoor activities in recent years, taking ham radio along on mountain bike and kayak excursions. I make a point of getting to know the frequencies for park rangers and forest fire operations as well as those of public service authorities nearby where I am playing in the woods. If you are out and about during forest fire season, this information can save your life. When I am kayaking navigable rivers and bays, I like to keep one ear on the marine band, especially Channel 16, 156.800 MHz (International Safety, Distress and Calling) and Channel 68, 156.425 MHz (commonly used for local talk in the boating world) just to know what is going on around me.

Most modern scanners provide access to the to the National Oceanic and Atmospheric Administration (NOAA) weather broadcasts. Many even allow you to enter National Weather Specific Area Message Encoding (SAME) information for local weather alerts. No matter what your area of interest, knowing local weather and weather safety information is a necessity.

Beyond the practical reasons for adding a scanner to your ham shack, it should not be forgotten that scanner monitoring is a ton

Scanning receivers such as the Bearcat BCD396T Digital Trunking Scanner are great ways to enhance and support the amateur radio experience.

of fun. With this in mind, I have often suggested that a scannist can begin to see local listening opportunities by taking a map and a drafting compass and drawing concentric circles out every 5 miles from his or her primary station location out to about 25 miles. With this visual tool, it is easy to see what frequencies you need to track down.

What are the towns, cities, municipalities within your listening area? Are there any major industries, shopping malls or public gathering spaces such as sports arenas? How about airports, train routes or navigable waterways? Are there any military installations? How about local, state or federal facilities such as prisons? What about hospitals?

Get the picture? The number of scannable entities rapidly multiplies once you give an area a good going over. And we haven't even mentioned area business band listening opportunities. I know more about what is going on in my town listening to area construction contractor crews than I get from my home town police force. These folks know the real deal.

You can also use scanning to directly enjoy amateur radio. I have talked many times in this column about the dearth of activity on many local repeater systems. No doubt you have noticed the same problem in your area. I keep all the repeaters within range of my shack in one bank on one of my scanners. I regularly let this run. Every evening a couple of these local machines will become active with a few hams ragchewing. I have no problem inserting myself into these conversations and making new friends along the way. The more hams that take time to blow the dust of their 2 meter mics and get these machines active, the better. You may want to give this a try as well.

Don't forget that most scanning receivers will do some level of frequency finding on your behalf. Not everything you can easily hear will show up on common frequency lists. Also, new stuff is always popping up. If your scanner has the capability to perform searches, pay special attention to that section of the manual. Make use of any search and store functions periodically to discover new and often important listening opportunities.

❖ Know Your Frequencies

I always hear folks carping about how the Internet has "killed the radio hobby." Well, in the scanning world, the internet has made the hobby better than ever. How, you ask? By making multiple sources of frequency informa-

tion easily available to any interested party. A general search as simple as "(your state, county or town) scanner frequencies" will no doubt bring up a great deal of basic information. Further research can be done at the FCC database **http://svartifoss2.fcc.gov/reports7/** or at many other sites such as **www.strongsignals.net/** and **www.radioreference.com/**

In addition to these major players, many dedicated local scannists may be providing support for your region, either through websites or by way of online newsgroups. My region is very well served by the "PhillyScanner" group on Yahoo groups **http://groups.yahoo.com/group/PhillyScanner/** . Your area may have something similar. A few keystrokes should turn up tons of useful frequency information.

❖ Know Your Local Systems

Once you have made some decisions about what you want to listen to, it is important to do a bit more research before you head out to purchase a scanning receiver. The main reason for this is the growing use of trunked radio systems in many regions. Simply put, trunking systems allow many users to operate on a limited number of frequencies – a major aid to crowded bands in crowded metropolitan areas.

The only problem is, no one scanner is capable of receiving every type of trunked radio system. Sadly, there are even a few systems that cannot be monitored at all with the current crop of scanning receivers. Part of the reason I have those two scanners running in the background as I write this article is that I have three separate types of trunked systems active in the range of my antennas: Motorola, EDACS and LTR.

If you are dealing with trunked systems in your area, make sure you find a scanner that is compatible with your needs. Likewise, make note of any other possible special areas of interest. For instance, not all scanners cover the military air band. If you have any local military activity, you may want to have access to this band of frequencies.

❖ Know Your Equipment

Again, for all the reasons mentioned above, give a lot of thought to the scanning receiver you buy and really look at its manual to determine its true capabilities and how it will work in the part of the world where you live, work and play. If you are the owner of a scanner that has been rendered obsolete by area systems going to a trunked system, do not fret. While some of the systems you will be interested in will be trunked, there will still be plenty of traditional frequencies. This older scanner may still be used to cover these non-trunked frequencies.

Also, with this in mind, you may want to think about the wideband receiver capabilities of some of the ham radio handhelds. While none of these rigs have the same level of performance as a dedicated scanner, and to date none has the ability to automatically follow trunked system traffic, they make a great choice for anyone who can get the signals they want without worrying about a bunch of radios pulling their pants down as they walk.

❖ Know Your Power Needs and More

I am throwing this in as a general consideration. Regardless of your radio hobby needs, you always have to keep one eye on issues of power compatibility. I bring this up in relation to both scanners and handheld ham gear. You have to make the choice between equipment that may require custom battery packs or to try to go with equipment that allows the use of common double or triple "A" cells. I choose to look for gear that does the latter, because, in a pinch, I can always pop out the drained rechargeable cells I use and replace them with off the shelf alkaline cells that can be found in any convenience store. I also look for equipment that can be powered off of the standard 13.8 VDC power found in most motor vehicles, at least by way of a plug-in adapter.

I always carry a small "go bag" with spare cells and any additional accessories that can enhance the monitoring and operating experience. One accessory I have come to see as essential in recent years is a good (and compatible) set of headphones. Speaking for myself, I just ain't getting any younger, and my ears have been ringing since sitting on top of any number of amp stacks at numerous rock concerts in the '60s. (Then there were those years of racing motorcycles with open pipes. But I digress...) I need lots of help in hearing and headphones do the trick. Most modern scanners work great with common personal audio headphone systems that can be found in many electronics stores.

The more ways you can find to keep your radios going when the going gets tough, the better off you are going to be. And in those tough times, being able to listen in on the local world around you will be very important. At all other times, scanning is just fun – sort of like ham radio.

I'll see you on the bottom end of 40 meters.

UNCLE SKIP'S CONTEST CALENDAR

ARRL September VHF QSO Party
Sept 8 1800 UTC - Sept 10 0300 UTC

North American Sprint, CW
Sept 9 0000 UTC - 0400 UTC

Tennessee QSO Party
Sept 9 1800 UTC - Sept 10 0100 UTC

YLRL Howdy Days
Sept 11 1400 UTC - Sept 13 0200 UTC

QCWA QSO Party
Sep 15 1800 UTC - Sep 16 1800 UTC

Washington State Salmon Run
Sept 15 1600 UTC - Sep 16 0700 UTC
Sep 16 1600 UTC - 2400 UTC

North American Sprint, SSB
Sept 16 0000 UTC - 0400 UTC

Texas QSO Party
Sept 29 1400 UTC - Sept 30 0200 UTC
Sept 30 1400 UTC - 2000 UTC

CQ Worldwide DX Contest (RTTY)
Sept 29 0000 UTC - Sep 30 2400 UTC

(Still Unknown)

Sunshine Radio- Their classic rock music is still hosted by a female announcer, in association with **Grasscutter Radio**. (sunshineradio@yahoo.com)

The Crystal Ship- "The Poet produces the "Voice of the Blue States Republic" with left wing political commentary and rock music on randomly selected frequencies including 1710, 3346, 3275, 5386, 6875, 6925, 7576, and 9057 kHz. The station has been around for decades. (Belfast and tcsshortwave@yahoo.com)

Undercover Radio- Dr. Benway's rock music "from the middle of nowhere" comes from a self-announced fixed location and occasionally from a mobile transmitter. (Merlin and undercoverradio@mail.com)

Voice of Captain Ron Shortwave- Another Captain is frequently active on the pirate bands with rock music. (captainron6955@hotmail.com)

WBNY- Commander Bunny's Radio Bunny still is the main clandestine parody voice of the Rodent revolution and monkey Freedom Fighters. Normally he is in upper sideband, but sometimes he transmits in slow scan TV mode. His fight against the Free Radio Network web site may have been resolved. (Belfast)

WHOT- Somebody has been relaying old shows from this ancient New York City rock music pirate hosted by Pete Sake and Jim Nasium. (None)

WMPR- If you hear techno rock "dance music" on the pirate bands, it is usually this veteran station. (None, QSLs only rarely at the Kulpsville Winter Shortwave Listeners Festival)

WNSR- This newcomer programs rock oldies featuring lyrics about the days of the week, such as "Monday, Monday" and "Friday on My Mind." (None)

Wolverine Radio- This relative newcomer to the pirate bands has been broadcasting classic rock tunes. (Still Unknown)

WSKO- Early speculation is that this may be new call letters for Psycho Radio, who has returned with rock music. Sometimes they use 6875 kHz in lieu of 6925 kHz. (syckoradio@yahoo.com)

WTCR- Using a MGM movie trumpet fanfare interval signal, Dr. Morbius at "Twentieth Century Radio," spins classic rock music on his programs. (Belfast)

❖ QSLing Pirates

Reception reports to pirate stations require three first class stamps for USA maildrops or $2 US to foreign locations. The cash defrays postage for mail forwarding and a souvenir QSL to your mailbox. Letters go to these addresses, identified above in parentheses: PO Box 1, Belfast, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 146, Stoneham, MA 02180; Casilla 159, Santiago 14, Chile; and PO Box 293, Merlin, Ontario N0P 1W0. Unfortunately, PO Box 69, Elkhorn, NE 68022 is announced as a no longer valid address, although a few pirates announce it, and some claim to still be getting replies through it.

Some pirates prefer e-mail, bulletin logs or internet web site reports instead of snail mail correspondence. The best bulletin for submitting pirate loggings with a hope that pirates might QSL is now the e-mailed Free Radio Weekly newsletter, still free to contributors via *EInsinge@vrxus.JNJ.com*. A few pirates will sometimes QSL reports left on the outstanding Free Radio Network web site, at **www.frn.net** on the internet. Unfortunately, given the demise of *The ACE,* that formerly widely read bulletin can no longer be used in order to notify pirates that a listener heard a broadcast.

❖ Thanks

Your loggings and news about unlicensed broadcasting stations are always welcome via 7540 Highway 64 W, Brasstown, NC 28902, or via the e-mail address atop the column. We thank this month's valuable contributors: Skip Arey, Beverly, NJ; John T. Arthur, Belfast, NY; Kirk Baxter, North Canton, OH; Jerry Berg, Lexington, MA; Artie Bigley, Columbus, OH; Ross Comeau, Andover, MA; Richard Cuff, Allentown, PA; Gerry Dexter, Lake Geneva, WI; Rich D'Angelo, Wyomissing, PA; John Figliozzi, Halfmoon, NY; Bill Finn, Philadelphia, PA; Harold Frodge, Midland, MI; Harry Helms, Smithville, TX; Ed Insinger, Summit, NJ; Ed Kusalik, Coaldale, Alberta; Chris Lobdell, Tewksbury, MA; Allen Lutins, Johnson City, NY; Greg Majewski, Oakdale, CT; A. J. Michaels, Blue Ridge Summit, PA; Joe Miller, Troy, MI; John Poet, Belfast, NY; Chuck Rippel, Chesapeake,VA; Martin Schoech, Eisenach, Germany; Lee Silvi, Mentor, OH; Bryan Wade, Elizabethtown, KY; Joe Wood, Greenback, TN, and one anonymous contributor.

A Simple, Wide-Band, Field-Strength Meter

In its pioneering days radio was called "wireless." The wireless transmitters were powered by an induction coil. When the high voltage from this coil produced sparks across a "spark gap" connected to the coil, the wireless waves (radio waves) were produced.

Crystal-set receivers were almost equally as simple as the spark-coil transmitters. They used a bit of crystal such as lead ore (galena) to detect the wireless waves. Connecting the crystal in a circuit with little more than an antenna, coil of wire, and headphones allowed reception of the raspy-voiced Morse code messages sent by the spark-coil transmitters. Today, the diode detector circuit in many modern receivers is essentially a bare-bones crystal-receiving set. Surprising as it may be, this, and much other history, is hiding inside most every modern radio receiver we have around today.

❖ Field-Strength Meters

Now let's consider a crystal receiver of a kind that serves in many contemporary two-way radio installations: a field-strength meter (FSM). An FSM is used as an indicator of the relative strength of radiation from an antenna. This includes antennas such as mobile whips,

adjustable coil-loaded whips, antennas with tunable traps, adjustable telescoping whip antennas on hand-held transceivers, and others.

❖ To Tune or Not to Tune

Some FSMs tune to the specific frequency of the signal being checked. On others, like the one described below, there is no provision for tuning. This circuit responds to signals from the low-frequency band, or even lower, on up to 500 MHz, and even higher. Mine worked well at 450 MHz, which was as high as I had equipment to test it.

A down side to the untuned design makes itself known when there is more than one radio frequency signal present at the FSM's antenna with sufficient strength to cause an indication on the meter. In that case, you would get an indication of the combined strength of the signals. However, this is almost never a problem because the sensitivity of the FSM is far less than that of an ordinary receiver, and typically only signals from antennas which are within a matter of feet from the FSM will cause a reading on the meter.

❖ Let's Build One

Fig. 1A shows the schematic diagram of the FSM. Those not familiar with reading

schematics will be able to follow the pictorial diagram of fig. 1B easier than that of fig. 1A. Keep all lead connections as short as is practical. You can make the connections by twisting the conductors together tightly, but it is best to solder connections. If you do solder, hold the leads from the diodes with a long-nosed pliers placed between the soldering iron and the diode. This reduces the heat transferred to the diode and makes heat less likely to damage the diode. Typically the diodes take the heat of soldering without damage.

The largest component of the FSM is the meter movement, and the FSM can be built to be scarcely larger than the meter movement itself. You can build the FSM without a case by attaching the circuit to the meter's terminals. On the other hand, it protects the circuit from damage if you put it in a small case.

For the crystal detectors I used germanium diodes. Examples of these diodes have part numbers: 1N34, 1N34A, and 1N60. Small-signal silicon diodes can be used, but they are much less sensitive than the germaniums. Contrary to things I've read, the Schottky diodes that I tried performed very poorly compared to germanium. I'd recommend germanium diodes if you can get them. Connect the diodes with the printed band, or bands, on one end of the diode as in fig. 1B.

Fig 1. Schematic diagram of the circuit of a simple field-strength meter (A), pictorial diagram of the field-strength meter circuit.

A=ANTENNA, R=100,000 OHM RESISTOR, D=DIODE, C=.1MFD CAPACITOR, M=METER

The meter movement's full-scale current sensitivity can be any low value from 50 microamperes up to one milliampere full scale. Remember that the lower the full-scale current sensitivity, the better the FSM responds to weak signals, so you'll probably want to use the meter with the lowest full-scale sensitivity that you have available. Connect the meter's + (positive) and - (negative) as shown in the diagrams.

You can use a digital or analog multimeter rather than a meter movement if the multimeter has a sufficiently-low current range. This is done in the first *Antenna-Related Web Site* above. Just connect the multimeter's test leads in place of the meter movement in the circuit of fig. 1, and set the multimeter to its lowest current range.

The antenna can be several inches of stiff wire, a telescoping whip antenna, or a metal rod. A telescoping whip is handy when you have stronger signals, because shortening its length will lower the meter's sensitivity.

❖ Using the Field-Strength Meter

The response of the FSM can be adjusted by changing its antenna length, or by moving the FSM closer to or farther from the transmitting antenna. You will also note a significant effect of antenna polarization on the FSM's response. That is, for the largest indication on the meter, the orientation (vertical, horizontal, etc.) of the FSMs antenna must match the orientation of the antenna under test. And remember that your presence near the transmitting antenna under test will de-tune it somewhat, so do your measurement as far from the antenna as is practical.

❖ Getting Parts

Many of us acquire a goodly supply of electronic components by removing parts from defunct electronic equipment. As of this writing Dan's Small Parts and Kits: **www.danssmallpartsandkits.net/** had 0-200 ua meter, capacitors, resistors, Schottky diodes, germanium diodes and silicon diodes: all for good prices. Radio Shack had resistors, capacitors and silicon switching diodes. If you do a web search with the phrase "electronic parts" you'll find lots of electronic supply sources.

RADIO RIDDLES

Last Month:

I asked: "Lightning affects more than safety in radio work. As mentioned in the answer above, increasing antenna gain is of little value for improving reception at some frequencies, but at other frequencies it can improve reception significantly. What does the occurrence of lightning around the earth have to do with this? "

Well, the occurrence of a lightning bolt creates radio waves that can propagate thousands of miles around the earth, just as other radio waves in the same frequency range do. These unwanted signals are received as noise (static) by our receivers. From the upper portion of the HF band on down far into the lowest frequencies, the presence of this noise is usually greater than the noise generated inside the circuits of our receivers. So the lightning-produced noise dominates the signal-to-noise ratio in the receiver at those frequencies. Increasing antenna gain increases the received noise as much as it increases the desired received-signal's strength. So reception isn't improved.

At higher frequencies, usually from the upper portion of the HF band and above, very-little lightning-produced noise is received. And so the receiver's own internally-generated noise becomes the noise of concern. In this case, increasing the desired received-signal's strength with increased antenna gain increases that signal's strength, but the strength of the major source of noise (internal receiver noise) does not increase with increased antenna gain, and so reception improves.

This Month:

The FSM described here is essentially a crystal-set receiver. If so, then how is the FSM of fig. 1 different from an ordinary crystal-set receiver we might use to listen to radio programs, and what would it take to make it into such a receiver?

You'll find an answer to this month's riddle, another riddle, another antenna-related web site or so, and much more, in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

RADIO RESTORATIONS

BRINGING OLD RADIOS BACK TO LIFE

Marc Ellis
marcellis@monitoringtimes.com

The BC-348 Restoration Continues

❖ From the Readers

Our first request for one of the Lindsay books (see box in August issue) comes from Reid Eisenhauer of Moncton, New Brunswick, Canada.

Health problems keep him at home, so he fills his time with his stamp collection and radio hobbies. One of Reid's first projects was a Radio Shack AM radio kit. This was followed up with a CB radio receiver kit that really got him hooked on radio. The first time he used it, he was able to pick up skip from a long way off.
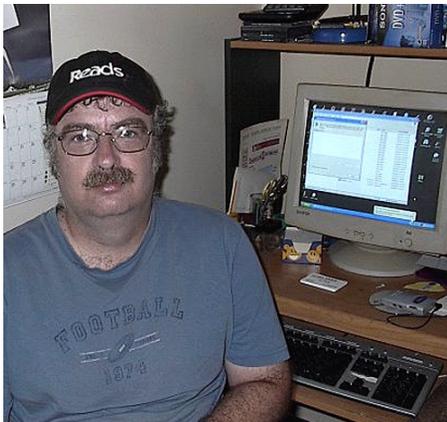
Reid Eisenhauer's hobbies include computers, SWLing and, now, tube radios.

Later, computers became his main interest, but he continued SWLing and also built some crystal radios from the Lindsay book, *Radios That Work For Free*. Lately Reid has developed an interest in tube radios, and is beginning to read up on them – which led him to become a reader of this column. A ham friend is encouraging him to study for his amateur license, and he hopes to get on the air soon, preferably using tube gear.

I have more Lindsay books to give away, so don't be shy. Send me a pic, a couple of paragraphs about you and your hobby activities, and your address – and see what you get from the grab bag!

Bobby, K4VE, writes that he recently bought two BC-348s from a person who is downsizing his collection, so is now avidly following this restoration series. Joe Erickson, N8PMF, also recently purchased two BC-348s and is following our series with interest. One is an -R and one a -Q, so he has examples of each of the basic versions of this set.

Both of his radios were missing nameplates, so Joe had some replacements made at a trophy shop. Right now, he is busy backing out owner mods – and has found a wealth of information on the internet. If you haven't done it yet, just Google BC-348 and see what turns up.

❖ Checking Resistors

Last month, we changed out all of the paper capacitors in our BC-348 – including the one hiding in the c.w. oscillator can. It wasn't possible to take care of that one without removing the can from the radio – a job that turned out to be a bit of a bear. This month's work session began with putting the can back together and reinstalling the radio.

I hope I don't have to take it out again! I recently read of a BC-348 restorer whose c.w.o. refused to work until he had replaced a *mica* capacitor in the can. I hadn't thought of doing that while I had the can open since mica caps so rarely go bad.

With the paper caps taken care of, I turned my attention to the resistors. One BC-348 restorer wrote that he had become suspicious of his resistors when he came across one that

Peeking between a couple of shield cans at the opened c.w. oscillator gives us a view of the replaced paper capacitor.

seemed to have spontaneously snapped in half. After doing some checking, he found that most of the others were seriously out of spec. (With age, some carbon resistors will significantly increase in value.)

I thought I had better look into the condition of the resistors in my set – keeping my fingers crossed. After replacing all the caps, I certainly wasn't looking forward to wholesale resistor replacement. Of course it isn't possible to measure the true value of a resistor without removing it from the associated circuitry; in circuit, it can be shunted by other components. But I used a practical technique recommended by a friend.

One checks each resistor without removing it from the circuit. If the resistance reads way too high, it definitely needs to be replaced. If the resistance is significantly lower than specs, this resistor is probably being bypassed by other components. Ignore it for now, but keep it in mind for later checking if the radio doesn't behave after being powered up. Actually, all of my resistors read very close to their marked values – so I began to have some confidence in their condition.

❖ Front Panel Installation

I had removed the front panel of this radio back in July and done a little cosmetic work on it. After washing with Murphy's Oil Soap, I used Q-tips and rubbing alcohol to get rid of most of the red crayon someone had used to outline under the bottom of the tuning dial bezel. After that the panel looked better, but the crackle finish was still dull and lifeless. I did make a major improvement in the looks of the ID plate by coating it with gloss varnish before temporarily setting the panel aside.

Now it was time to complete the job so that I could reinstall the panel on the set. Writing in the January 2007 issue of *The AWA Journal* (Quarterly Bulletin of The Antique Wireless Association), Lane Upton recommends the use of WD-40 lubricant for restoring a crackle finish or other painted surface.

The lubricant is simply sprayed onto a cloth (Turkish toweling material recommended) and applied thickly to the surface. After sitting for five minutes, the excess is removed with paper towels. Then more Turkish toweling is used to polish the remainder into the finish. After this treatment, Lane recommends that the piece be allowed to sit for 24 hours, after which it can be handled without leaving fingerprints.

Thanks to its front-panel face lift, our BC-348 is beginning to look quite sharp – even without its control knobs.

I used this quick-and-dirty technique on my panel with very satisfactory results. The overall color has deepened and the white finish on the raised lettering now stands out much more vividly. But I can't say that the crisp texture of the original crackle finish (still visible in the protected area under the dial bezel) was restored. And there is a little more sheen in some areas than others. However, this set had been stored under less-than-ideal conditions for some time and I suspect that the weathering on the finish is irreversible.

The re-installation of the front panel took a lot longer than the original disassembly! A few of the retaining nuts were located in spots where fingers could not go. The same was true of the tapped metal plates that serve as nuts for the two handles. The handles could have been installed with ease had I been smart enough to put them on before assembling the panel to the chassis. That'll teach me to make better notes next time I dismantle a set!

❖ Power Supply Considerations

With the panel back in place, I turned my attention once more to electrical issues. There is still finish restoration work to be done on the knobs, but I decided to wait until the next work session to complete that and reinstall them.

What I wanted to do now was to decide on where to put the a.c. power supply for the radio. Some restorers choose to build the supply into the well formerly occupied by the dynamotor. Others prefer to locate the supply outside the set, connecting it to the innards via an umbilical cord. I would have preferred the inside location, but the size of the parts available in my junk box dictated otherwise.

As mentioned earlier, a previous owner had rewired the heater circuits of this radio to operate from 6 volts rather than the original 24. All of the tubes are actually 6-volt types, but had been wired in a series/parallel arrangement to arrive at a 24-volt input. I decided to leave the wiring change in place so that I could use a standard receiver power transformer in my supply.

To match the output of the original dynamotor, the B plus supply would have to deliver about 225 volts at – I would guess – about 100 ma. As it happens, the receiver transformers I had that would fit comfortably in the dynamotor well fell short of a 100 ma. rating. The ones that would provide at least 100 ma. were too big.

I don't know how many of you have priced out new transformers at one of the antique radio supply houses. Those who have done so will understand why I decided to go with something that I already had on hand. Ergo – my power supply would have to be external.

Having decided that, I would have to figure out how to get the wires from the power supply into the cabinet without drilling a hole. There were no ventilation holes or other existing cabinet penetrations I could use. The receiver's connections to the outside world are normally made through a male plug that does exit the back of the cabinet, though there are no openings around it that might provide a route for my wires.

I didn't want to remove the plug or modify its wiring in any way. However, I noticed that the aluminum casting surrounding and sealing off the plug could be removed from the cabinet by taking out six screws. Doing that created an opening under the plug through which I could pass the wires. I plan to tape the casting and a packet containing the screws to the floor of the empty dynamotor well – along with a note explaining where the piece came from.

❖ Setting Up the Connections

Without worrying too much about the design of the power supply I would eventually put together, I decided that I would now install the connecting wires. These would be individual wires that would be about 18" long after passing out of the cabinet. Of course they'd be sized appropriately to carry the expected currents. Eventually they would be bundled into a cable and fitted with a plug for connection to the supply.

As previously mentioned, an earlier owner had removed the original screw-terminal power connection strip along with the dynamotor and brought the leads to unused lugs in a terminal strip at the back of the chassis. The stubs of the connections that had once gone to his power supply were still soldered to these lugs. I have to admit, it gave me some satisfaction to remove these poorly soldered stubs and replace
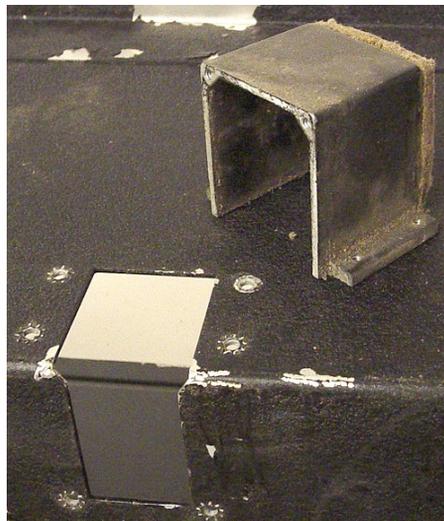
Removal of the connecting plug shield from the inside of the BC-348's cabinet makes it possible to feed in power supply wiring without drilling holes.

them, one by one, with neatly installed leads of my own. In each case, I double-checked the schematics to make sure that the connection was being made to the correct point.

And speaking of checking connections against the schematic, I want to stress, again, the importance of acquiring a complete maintenance manual before beginning restoration of a BC-348. If at all possible, get one of James A. Moorer's superb scans from his site at **www.jamminpower.com/main/bc348.jsp.** It is well worth the long download time.

The pictorial diagrams are of particular importance in working on a set where the wiring is almost all enclosed in tight cables. These are the diagrams where the parts and connecting wires are shown as representational drawings rather than schematic symbols. For instance, tube sockets, terminal strips and plugs are shown much as they look in real life. Each interconnecting wire is drawn in position in its cable and may be traced with the help of a straight edge. The draftsmen who produced these incredibly detailed drawings were totally amazing.

Of course, in some situations, you will also have to rely on the standard symbolic schematic drawings – which emphasize the electrical interrelationships between the components rather than how they are connected physically.

I'll be back with you next month, when we'll clean and reinstall the knobs, add a power supply, and conduct a smoke test.

Model Motors from Scrap

By Greg May, W2ORO

As a youngster, I remember reading library books illustrating how to build simple electrical projects. In searching the shelves of a modern, suburban, public library I see that times have changed. Perhaps kids aren't as interested in building things, or perhaps adults are overly fearful that children could come to harm if left at a workbench with a complement of tools. Even the staple No. 6 dry cell so indispensable to the young inventor has become obsolete.

My wife, Judy, wanted to experience this joy from the past. We traveled to a library that had kept these grand old books, and gathered up a variety of plans to build model motors (Figure 1). She had a blast building two of them, and now it's my turn. Please remember that the material I will present is not my own; these projects came from the minds of fine authors of yesteryear. I will credit them as sources at the conclusion.
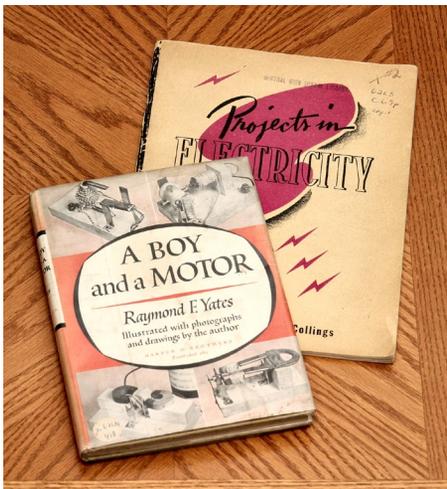
Figure 1. Two old books from the library's basement.

❖ The Basics

To begin, I will offer my own advice: in choosing your scrap materials, be flexible and be inventive. Try to use whatever you have laying around. The basic premise of an operational motor is quite forgiving. As long as you are not trying to alter a law of physics, you can be very imaginative in changing these plans to suit your desires.

In the March 2007 issue of *MT*, photos appeared showing the two motors that Judy built. I will present how they were con-

structed. But first I am going to delve into the details of the motor I am building now, so I can offer some photographs of the process. Let's start with some terms:

Field coils: the stationary electromagnets. Could be just one if in the shape of a large, flattened "U".
Armature: the rotating electromagnet mounted on a shaft.
Commutator: the rotating set of electrical contacts mounted on the shaft that deliver power to the armature.
Brushes: the flexible metal elements that rub against the commutator to deliver electricity. Arcing will slowly eat away the metal of the brushes.

Winding the wire to produce the field coils and the armature is key to building a motor. In almost every case, there is a core of steel or iron, with many turns of wire wrapped around it. The old books are quite specific that these cores should be made of "soft iron," an antiquated term left over from the 1800s. Suffice it to say that mild steel works fine, so bolts, nails, and rods are ideal as long as they are not hardened alloys. Theory has it that hardened steel would become a permanent magnet inside the coil of wire, ruining the operation. For my motor, I actually tried to obtain the elusive soft iron; a fellow ham, N7TG, gave me a very old piece of iron rod that I am using in my field coils.

The books teach that all coil cores must be insulated from the wire. The universal choice at the time was paper and shellac. I question if this practice is still necessary with modern wire insulation. Judy and I have

chosen to wrap the metal cores with masking tape, and to use thin cardboard on the ends.

Magnet wire is the best choice for winding coils; the thin enamel insulation allows a dense winding. 22 gauge is commonly recommended (Figure 2). I would expect other types of wire would also work. Since I did not have enough wire on hand to build several motors, I found a supplier of 22 gauge magnet wire at **www.mpja.com** (item number 7254-WI). Sandpaper or an old knife blade can be used to strip insulation from the ends of magnet wire.

❖ Construction

The base and the field coil supports are nothing fancy, just scrap 2x4 stock. Specific dimensions are contained in Table 1.

TABLE 1	
Specs and Dimensions for the 1941 Collings Motor	
Field cores (2)	2" x 7/16"
Armature	1-5/8" x 3/4" x 1/8"
Shaft	3"
Wood base	7-1/8" x 3-1/4" x 1-1/2"
Field supports (2)	2-1/2" x 1-1/2" x 1"
Wood commutator	3/4" long x 1/2"

For the armature of my motor, author Collings called for a short length of flat iron, and coat hanger wire for its shaft. A good substitution for the flat iron would be four or five pieces of a "tin" can laminated on top of each

Figure 2. Spools of magnet wire and a simple but helpful holding device.

Figure 3. The soldered armature core and metal supports.

other. For the shaft, cutting the head off a nail could serve instead of the coat hanger wire. After drilling a snug hole into the armature, I soldered in the shaft (Figure 3). Epoxy glue would be a fine bonding alternative.

I cut the iron rod for the field cores, and glued them into holes drilled into the wooden supports as seen in Figure 4. If you were to use bolts, complete with heads, you could just screw them in. For all the gluing on my motor, including the conclusion of the wire windings, I used polyurethane glue (Gorilla Glue). After adding some end caps cut from cereal box cardboard, I began winding. Be sure to leave six inches free for later connections; this free end can be held in place temporarily with a bit of gaffers tape. I wrapped on four layers of wire (30 feet), and applied

Figure 4. Field cores and wooden supports.

a dab of glue to freeze the last couple of turns in place.

To wind the armature, leave three inches free, and begin in the middle. Wind the wire out towards the end and back, giving you two layers on the first pole. Cross over the middle, straddling the shaft, keeping the direction of your winding constant (Figure 5), and complete the second pole. If you wish four layers of wire like I did, cross over again and repeat the process. Mine took 30 feet of wire, making a total of 90 feet used in this motor.
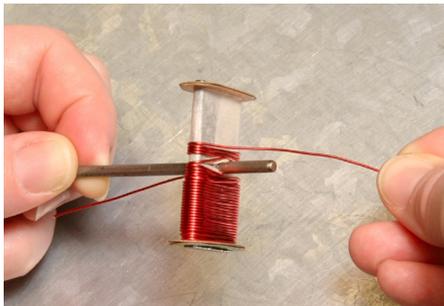
Figure 5. Winding the armature. Note that direction is maintained while crossing to opposite pole.

The commutator is fabricated of half-inch dowel, with two squares of metal glued to it. A hole for the shaft has to be drilled down the center of the dowel (Figure 6). Make it snug with a piece of masking tape applied to the shaft, or glue it in place. The metal may be tin can or 1/2-inch copper pipe. I used a tubing

Figure 6. Commutator pieces before gluing.

cutter to obtain 5/8-inch of pipe, and then slit it lengthwise using a Dremel rotary tool with an abrasive cutoff wheel. Metal cut from a food can could have been sheared using tin snips.

MT READERS ONLY

To access the restricted website for the month of August, go to www.monitoringtimes.com, click on the key, and when prompted, enter "mtreader" under the user name. Your password for August is "tower" – Check in each month for new material!

The commutator must be properly aligned so that the gaps between the metal contacts are toward the ends of the armature poles. When the glue has cured overnight, the leads from the armature winding can be carefully cut to length, bared, and soldered, one to each commutator contact. This detail is visible in Figure 7.

Figure 7. Completed armature with commutator connected by soldering.

Supports for the armature shaft can be snipped from metal; I used the case from a discarded VCR. I drilled holes to mount the shaft 1-3/4 inches above the base, so as to be even with the height of the field coils. To secure the wooden field coil supports, I drilled pilot holes up from the bottom and countersunk long wood screws, one per coil.

Brushes can be fashioned from any springy metal, from tin can to hookup wire. I have this neat, thick, bare, multi-strand copper wire – I don't know where it came from, but it works great and it's durable. Just bend the shape you need in your material and screw it onto the base. It should lightly ride upon the commutator as the shaft rotates.

I added two wire terminals at the front for connection to the power source. These are simply machine screws counterbored upward from the bottom of the base. To celebrate the completion of construction, I treated myself to a couple brass knurled knobs from the hardware store. The finished model is shown in Figure 8.
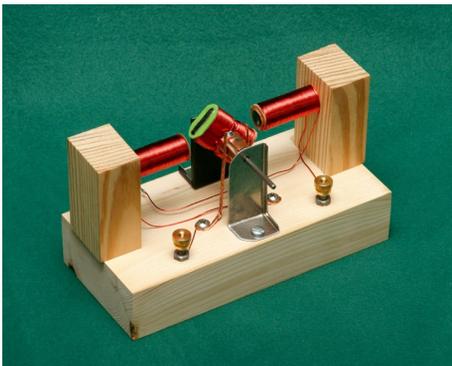
Figure 8. Finished 1941 Collings motor.

❖ Electrical
The wiring is all connected in series per author Collings (the alternative would be a "shunt wired" motor, in which the elements of the motor are paralleled). So, connect a terminal to a field coil, that coil to the other coil, the 2nd coil to a brush, and the other brush to the last terminal. Before making the connections permanent, experiment for a moment with a magnet or a compass. When power is applied to just the two field coils, the tip of one field coil must be north while the other is south. If this is not the case, reverse the polarity of one of the coils. Otherwise, the motor will not run. In motors like those that Judy built which have only one field coil, this is not an issue.

As a ham, I have picked up a couple of old-fashioned "battery eliminators" from hamfests. These variable-voltage, 10 amp power supplies are perfect to run a motor. Six volts is usually a good starting point. A six-volt lantern battery should also work perfectly. In a pinch, try a few D cells to get your model up and running.

I have included a list of my five favorite motor books in Table 2. These are wonderful old books. The authors delve into more detail, including theory, than I have. Plus, there are additional plans contained within their pages.

TABLE 2

Out-of-Print Books

Projects in Electricity, Merle D. Collings, 1941
A Boy and a Motor, Raymond F. Yates, 1944
Fun with Electricity, Tom Kennedy, Jr., 1961
The World Book Encyclopedia, 1968, Vol. E, "Electric Motor"
Easy to Make Electric Gadgets, Leon Stanley, 1980

❖ Judy's Motors
The two motors that Judy built both utilize a single field coil bent into a flattened "U" shape. The first one, from plans in the 1968 *World Book Encyclopedia,* employed a wooden broomstick for the motor shaft (Figure 9). A five inch long bolt passed through the shaft to serve as the armature, and sewing pins were stuck in the ends of the shaft to
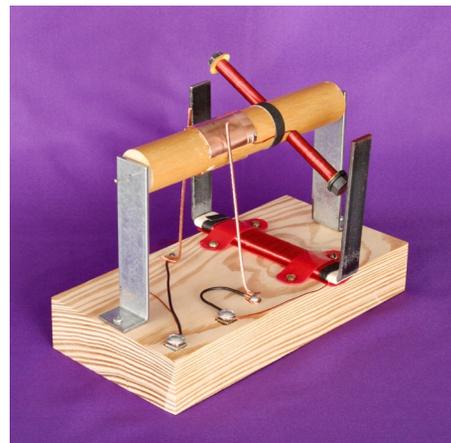
Figure 9. Judy's first motor, the plans coming from the **1968** **World Book Encyclopedia.**

serve as bearings for the metal supports. The field coil was flat steel 3/4-inch by 1/8-inch, strapped in place using screws and plastic pieces cut from the lid of a peanut can. She put 20 feet of wire on the armature, and another 20 feet onto the field coil, but for a motor this massive you could double that amount of wire and probably see improved performance. For the commutator, she cut squares from 3/4-inch copper pipe; the copper pieces were glued to the wood dowel using epoxy glue.

Her second motor, from Stanley's book, was simpler to construct (Figure 10). For the armature and the field coil, the plans specified 12 gauge soft steel baling wire, which she happened to have. Wire from standard old clothes hangers would be an almost identical substitution. The core of the field coil is made of six lengths, each 5 inches long. Bundle them together tightly, and tape the bundle heavily on the ends with 1/2-inch masking tape. Then bend it into a "U" shape.
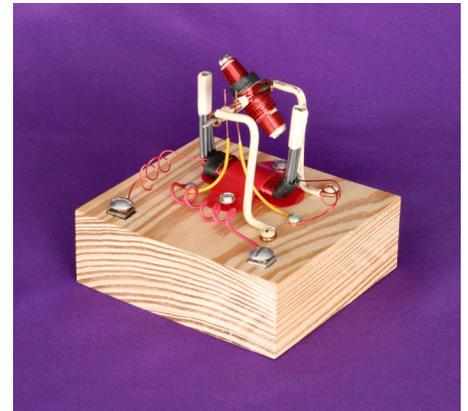
Figure 10. Judy's second motor, made literally from scrap wire and masking tape.

For the armature, six lengths of steel wire, 1-1/2 inches long are bundled with tape. A nail, about 2-1/2 inches long, is stuck through the center of the bundle to form a cross and is secured using diagonal strips of tape. This serves as the shaft. 15 feet of wire was wound onto the armature, and 15 feet onto the field core.

For the commutator, build up the diameter of the shaft by wrapping a 2-inch long piece of masking tape around it. The bare ends of the armature wire are then carefully laid on top of the masking tape, making a couple of sharp U-turns. These become the commutator contacts, and are held in place with narrow, 1/8-inch strips of tape at each end. The two shaft supports were simply bent from 12 gauge copper house wire using needle nose pliers. 18 gauge copper hook-up wire was springy enough to constitute the brushes.

Whether building a motor with a youngster at your side, or just bringing out the youthfulness of your own heart, these models can be fun. With the added benefit of being educational, a small project like this can remind us of the basic principles important in understanding electricity, and how they were presented to young minds of yesteryear.

Cambridge SoundWorks 820HD AM/FM HD Radio Receiver

By Ken Reitz

Cambridge SoundWorks (CSW) is one of those innovative audio companies from the talent-rich area around Boston. It's no surprise then that CSW has entered the HD Radio fray with a product that continues the tradition of merging style and sound. As a stand-alone table radio, the audio is on par with any, including the much hyped Bose Wave Radio. Using the digital output from the 820HD's tuner direct to your stereo, via the fiber optic cable output, the audio is unparalleled. It brings any older stereo with fiber optic input immediately into the 21st century.

❖ Sounds as Good as it Looks

The 820HD is not a big radio. At a little over a foot wide, just 7.5" deep and only 4.5" high, this radio gives the impression of being a normal table radio, but at 8 pounds the 820HD is a weighty package of heavy duty speakers capable of filling a large room with real audio fidelity. From the heaviest bass intro to the final symbol crash, you won't miss a thing. That's the legacy of Cambridge SoundWorks products. If you've not heard them before – from earlier analog radios to their acclaimed loudspeakers – your ears are in for a treat.

The molded, shiny black cabinet is sealed to project the audio from the two front fired speakers and the molded bass port on the back. Making the most of only two multi-function knobs, the 820HD also uses micro switches on the front panel and a variety of ports for optimum flexibility.

Want the best possible sound from your iPod® or other MP3 player? Hear what's been missing from those dinky ear buds when you plug it into the auxiliary port on the 820HD's side.

The slightly oversized remote control performs all front panel functions including direct entry tuning, station presets (up to 30 AM and 30 FM), seek/tune buttons and a switch to go from digital to analog tuning for those HD Radio stations that don't quite lock on.

❖ Tuning with the 820HD

AM reception on all of the HD Radios I've tested in the last year has not been impressive. Since this spring, when the FCC dropped its ban on AM HD Radio broadcasts at night, I've been hoping to be able to tune AM HD DX. While I can get the HD symbol on several models to flicker, indicating that it's sensing an HD Radio signal, none have been able to lock on. Daytime reception has been little better. One reason for both is that only a few hundred AM stations across the U.S. are currently transmitting an HD Radio signal. I have been able to lock onto one local AM HD Radio station some 60 miles away during daytime listening.

FM reception on the 820HD is typical of a radio in its class: it's good but it's not a "DX machine." There is no built-in AM ferrite loop antenna and no built-in FM antenna. The 820HD comes with a small non-tunable AM loop, a screw-in telescoping FM antenna, and a folded dipole wire FM antenna, all of which are of marginal use outside of most urban or suburban locations.

CSW advises that AM reception can be improved by using a tunable AM loop antenna in conjunction with the small loop. Not really. AM reception, even with a tunable loop added, was

Rear view of the arctic white 820HD: minimal design and maximum sound. (Courtesy: Cambridge SoundWorks)

not as good as, for example, Polk Audio's iSonic HD Radio. FM reception in a rural location is only optimum with the addition of an amplified Yagi antenna mounted at 30 feet on a rotatable mast.

❖ Final Word

Cambridge SoundWorks 820HD is a full-featured, beautifully designed, solidly built, HD Radio with unequaled audio. For playback of MP3 or streaming audio from your computer the 820HD delivers full-bodied sound which can fill a large room. Hooked up to a decent FM antenna and connected through the fiber optic audio cable to your stereo you'll get the best that today's FM multi-casting and HD Radio has to offer. At $299.99 the 820HD is a better product at a far better price and with more features than the much advertised, non-HD capable, Bose Wave Radio II.

WHERE TO BUY:
Cambridge SoundWorks 800-367-4434
www.cambridgesoundworks.com
$299.99

Front view of the onyx black Cambridge SoundWorks 820HD: stylish sound for HD Radio reception. (Courtesy: Cambridge SoundWorks)

MANUFACTURER SPECIFICATIONS

Cambridge SoundWorks 820HD

Dimensions:
    4.5" H x 13.25" W x 7.5" D
Weight: 8 lbs.
Tuning Range:
    AM 530-1710 kHz
    FM 87.5-108.1 MHz
Station Presets: 10 AM 10 FM
Additional Favorites: 20 AM 20 FM
External ports:
    75 Ohm FM coax antenna connector
    3.5 mm AM antenna connector
    3.5 mm stereo headphone connector
    3.5 mm Aux. Input connector
    Toslink fiber optic audio connector

MT REVIEW

MFJ Model 1623 Window/ Balcony Mount Antenna

By Ken Reitz KS4ZR

Of the hundreds of thousands of hams and SWLers in the US, many thousands live under the oppressive rules of Home Owner's Associations or restrictions imposed by landlords, neither of which allow them to put up the antennas they'd like to have for their hobby. Many have found ways around such restrictions by using antennas disguised as flagpoles, black wires dangling out of apartment windows, and an assortment of commercially made antennas. Among those solutions are two from MFJ Enterprises – the models 1622 and the 1623.

❖ Laborious Procedures

The main difference between the two units is that the model 1623 has an attached antenna tuner with RF meter and costs $199.95. The 1622 does not and costs $100 less. If you have an older rig, you may benefit from the attached transmatch, but if yours is a newer transceiver with built-in antenna tuner, you would want the 1622. I tested the 1623 with and without the transmatch in several combinations with my transceiver and with a portable shortwave radio in two different locations: downstairs using a deck railing and upstairs using a window.

MFJ-1623 Window/ Balcony Mount Antenna features a 12' telescoping whip antenna, built-on antenna tuner, and retails for $199.95. (Courtesy: MFJ Enterprises)

Because this antenna may be used in close proximity to where people are likely to be (*e.g.* a deck), you'll need to review all the warnings MFJ has scattered throughout the slim owner's manual concerning touching the antenna element during transmitting, touching both counterpoise and antenna terminals while transmitting, possible arcing between the counterpoise and antenna terminals, stray RF in the shack, where to string the counterpoise wires (under rugs or carpets, they suggest), various grounding issues and last, but certainly not least, using the included safety rope so that, in event the antenna falls off your

MFJ-1622 Apartment Antenna covers 40 through 2 meters has smaller telescoping whip, no tuner and retails for $99.95. (Courtesy: MFJ Enterprises)

balcony or window, the antenna won't hit anyone. You may get the feeling that this antenna is not easy to live with.

But, here's another problem: In order to transmit using this antenna, you'll need to set it up manually in a different configuration for each band you operate and, depending on how big the band is, different frequencies within the band. This procedure involves adjusting the antenna, counterpoise, and matching knobs as well as the loading coil jumper wire each time you switch bands. Not exactly user friendly. If you do go to all that trouble, I'd recommend using bits of colored tape to code where those settings are for each band you use.

Further, the review unit I received had quite a few items left out of the manual. There was no picture depicting the assembly of the unit and no mention of the loading coil or explanation of the coil tapping wire and how it's used. The coil and tap wire is essential to getting any kind of signal out of this antenna. I found that it was kind of like using a cat's whisker on an old Galena crystal radio set. This would be a real problem for beginners who need more instruction than is provided.

❖ Other Limited Space Options

The thing I liked best about this antenna was the general construction and components used. For instance, the mounting bracket was made of stainless steel and could be used in a number of configurations, depending on your window or balcony. The 12-ft telescoping whip with 3/8" x 24" threaded stub (MFJ-1956) can be bought separately for $29.95 and used in a number of interesting antenna projects. So that got me to thinking about other limited space options which

may work better, particularly for SWLers.

The MJF-1020C Active SWL Antenna ($89.95) is much smaller, cheaper, and very easy to use (see my review *MT* Aug. 2002). It's a better choice for SWLers because it has an antenna pre-amplifier built-in and the antenna can be detached and an external antenna of your choice connected.

MJF-1020C Active SWL antenna is a better choice for SWLers with limited space. (Courtesy: MFJ Enterprises)

In the September 2006 issue of *MT* I reviewed the MJF-932 Mini Loop Tuner, which uses a loop of wire or copper attached to a tuner which makes the loop resonate on the band for which the loop is cut. At the time I speculated that the 1622 might be a better choice, but after having used the 1623 with attached tuner I have to say it's not. The big advantage of the loop is that it can be rotated for maximum signal – something that you can't do with a vertical such as the 1622 or 1623.

❖ Final Word

Using either of these products is not easy. Having to re-tune the antenna for each band change can be a pain, finding a suitable place to mount either antenna is not easy. Those who will find success with either of these two products will be dedicated radio enthusiasts indeed. If you operate QRP (low power usually under 10 watts) on one frequency per band such as is common on PSK31 mode, this antenna may be more user friendly.

Remember, too, that no small antenna operated at low power can overcome poor band conditions, and we remain at or near the bottom of solar cycle 23. But, in the next 12 months band

conditions will rapidly improve, and if you live in an apartment or condo, products such as the MFJ 1622 or 1623 may make the difference between staying in the radio hobby and giving up.

❖ Specifications

According to the manufacturer, this unit tunes 80-6 Meters, though if the telescoping whip antenna is extended to its full 12 feet you won't have much of a signal on 80 meters. Maximum power capability is said to be 200 watts, but at such high wattage there could be considerable RF in the area of the antenna as you attempt to tune it.

The air-wound "bug catcher" style antenna loading coil is 8-3/8" long and 2.75" in diameter and has 50 turns. There is a 3/8 x 24 threaded stub at one end and a 3/8 x 24 threaded socket at the other and an alligator clip tap to adjust the resonance. Three counterpoise wires of different lengths with attached washer terminals are provided.

The counterpoise and antenna terminals at the top of the unit have several washers and lock washers and are kept in place by wing nuts. The terminals are mounted on a fiberglass plate which is inset into the top of the case. While unloosening the wing nuts it's easy to let all the washers fall into the recess. You'll need a magnet to retrieve them.

Telescoping Antenna: 12' (23.5" collapsed)
Cabinet size (Tuner/RF meter): 2.5"(H) x 7.5" (W) x 3" (D)
Weight (including antenna/mount and tuner): 6 pounds

NetWorks and NetWorksGo from Tivoli

By John Figliozzi

Most of us reading the coming ads for these new products from **Tivoli Audio** likely will experience a deja-vu of sorts. "Travel the world and never leave home behind" reads the publicity sheet for *NetWorksGo*, Tivoli's portable internet/FM radio which – along with *NetWorks*, Tivoli's internet/FM table radio – is scheduled for a late 2007 release.

Yes, these descriptions formerly reserved for shortwave are now being applied to internet radios. And radios they are. There's no need to boot up the computer. With a wireless (WiFi) or Ethernet internet connection, thousands of radio stations – including many HD multicast and DAB – worldwide can be received literally at the touch of a button.

Both *NetWorks* and *NetWorksGo* decode WMA, MP3 and RealAudio and include an easy-to-read backlit display, digital clock, alarm and sleep timers. There's a USB input for connecting a compatible MP3 player or memory stick, a stereo headphone output, and an auxiliary input for iPod or similar audio device. Internet stations may be browsed by country and genre and selected via preset, menu or direct input of a station's call letters. Music files can be streamed from your PC and each model's software is easily and fully updateable as upgrades become available.

The *NetWorks* table radio is housed in a furniture grade wood cabinet with a 3-inch magnetically shielded full range driver. A right channel output allows for an optional matching stereo speaker and a compact remote control is included.

The *NetWorksGo* travel model goes a big step further by making internet radio truly portable. Along with its WiFi reception capability, six "C" cell batteries and a built-in charger for use with NiMH or NICADs provide for up to twelve hours of use without resort to mains power. It has a 2.5-inch magnetically shielded full range driver in weather-resistant housing with rustproof hardware.

And for those progressively fewer occurrences when internet access is not available, there's FM and FM RDS Data System reception with manual and auto seek tuning.

Release date is late 2007 and the retail price is yet to be determined. At the new product demonstration I attended in New York on June 22, each radio easily ping-ponged around the globe and provided a rich, full audio experience. I already know what I want for Christmas.

COMPUTERS & RADIO

RADIO-RELATED SOFTWARE & HARDWARE SOLUTIONS

John Catalano, PhD
johncatalano@monitoringtimes.com

Vox Radio Populi
PC Digital Audio Recorder Programs

Recording audio from our radio monitoring efforts can be useful and rewarding. Listening to recorded radio transmissions of a historic event can instantly transport you to the feelings of the past. Listening to my recording of the immense amount of chaotic radio traffic at the onset of Desert Storm 1 brings me back to the fears and concerns that we all shared at the beginning of that conflict.

Recording of non-world changing events can still hold personal importance. I recently found an off-air recording made by a friend of mine who always had five scanners tuned to commercial aircraft frequencies. It was of me and my Dad, flying a Cessna above Syracuse, NY, in the 1970s. We were in radio contact with Hancock Airport's Approach Control and Tower. So much has changed since that fine VFR day.

Hello 1s & 0s

Unattended recording of programs and intercepts, whether on shortwave or VHF/UHF, while we are away from our radios, is an excellent use of automated radio audio recordings. But recording technologies have changed drastically since I first recorded Radio Canada International's DX program in the 1970s on reel-to-reel tape.

Today, using magnetic tape for analogue audio recording is as common as using a spark gap transmitter. Back in 1985, Philips launched the digital revolution in music with its introduction of popular music on Compact Disc, CD. This was the death knell of cassette tape and analogue audio.

With the advent of dedicated chips for digitizing audio, the development of audio compression formats, and the fall in prices of memory chips, today's portable digitized audio is for everyone. Did you ever hear of an iPod or MP3 player? These are digitized audio devices.

If you have a modern PC sitting in your radio shack for logging, radio control, or whatever, you already have the makings of a digital audio system that you can use for your radio monitoring. Let's look at some useful digital audio recording programs.

We used a PC with a 1.6 GHz Duo Core T2060 CPU, 1.4GB of RAM with a Vista Home Basic operating system for trying out our audio recorder programs. Once again we will see that Windows Vista provided us with some "interesting" situations. Nothing serious this time, just annoying.

❖ RecAll Pro

The RecAll Pro program from Sagebrush
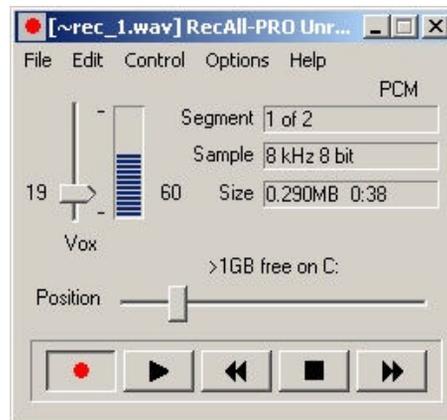
Figure 1 – RecAll Pro Audio capture software from Sagebrush

can be categorized as small and simple and super! Figure 1 shows the simple small box that appears when the program is started. The vertical Vox slider setting of 19, at left, means that the recorder is activated when the signal's audio level is above 19. Vox is Latin for voice, but it is a common acronym for voice-operated relay (don't ask me where the X came from).

The vertical bar next to the slider displays the audio of our radio transmission. Here we can see it is at 60, so we are recording. There is quite a lot of control and data functions in this small box.

From the Options-Preferences menu we can further fine-tune the vox parameters, including seconds of silence before recording stops, seconds of audio saved before vox is triggered, and minimum time of a recorded segment. The last feature can be useful in an electrical noise "spike" environment.

From the same menu we can set RecAll Pro to produce a new file each time the recording either stops or starts. Alternatively the user can set the program to generate a new file after a user defined number of seconds of quiet. This mode can be very useful for scanner users trying to catch infrequent transmissions, for example, en-route military aircraft in the UHF band.

RecAllPro version 1.4 has many other features, including: variable playback speed control, mark selection, file annotation and audio file manipulation, such as cut, paste and record insert. A very useful feature for radio monitors is RecAllPro's Report File, which details the date, time and duration of each segment. This is great for pinpointing the exact time of unattended transmissions.

The one problem I did have was not RecAllPro's fault. Using Windows Vista I could not access the help file and was directed to a Microsoft site for a Gates' excuse.

A 30-day trial version of RecAllPro is available at **www.sagebrush.com/**. The registered version costs $29.95. A lite version, RecAll, is also available.

❖ Scancorder

Scancorder, Figure 2, is a basic, but capable digital audio program. The top numeric display shows the current date and time. The display below indicates the elapsed time of the current recording. The function of this display can be changed using the "Arm" button to the left of the display. Using this button, the "start" and "stop" time can be set for timed recording sessions.

On the right is the Vox level control and the input signal level bar meter. From the dot in the vox box and the fact that the input level is above the vox level, we can tell that the program is in the process of recording a transmission. The running stick figure at the bottom left is another indication of recorder operation.

Figure 2 – Scancorder's main screen grabbing audio from a scanner

Scancorder's operation is pretty intuitive with the use of the button labels. Good thing, since once again, due to Vista, the Help file was not accessible.

Another useful feature is that the user can generate script files to detail a number of recording times and modes that will be performed without operator intervention. Scancorder, version 1.4 was easy to use and did a very good job of catching hours of scanner transmissions.

You can download Scancorder at **www.coaa. co.uk/scancorder.htm** and use it for 15 days for free. After that is will cost you 25 Euros.

❖ The Sound Recorder

Next up is Sound Recorder version 1.9, a freeware program whose name sounds a bit like the program we just looked at. As indicated on its

website at **www.davee.com/scanrec/** this program was designed with radio monitoring in mind. Their site states, "Since FM communications has such an effective squelch, the recorder works best with FM. HF ham bands and World Band radio have such a poor signal to noise ratio that the VOX gate on Scanrec might not be very easy to set."
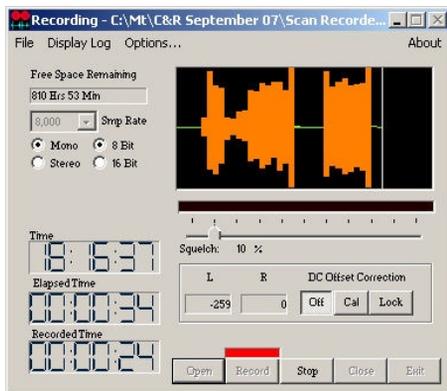
Figure 3 – Scan Recorder doing its thing

In our limited tests, noise on the HF band caused many false record starts. However, its operation in the VHF/UHF bands with a scanner was very good.

Figure 3 shows Sound Recorder in idle (not recording). However, you can see from the peaks in the spectrum that it has just received and recorded two transmissions. The current signal level, or lack thereof, is indicated in the horizontal bar below the spectrum graph. The user-set squelch level is below this and is currently set at 10%.

An interesting feature of Sound Recorder is its Free Space Remaining display. Here it shows that if I use all of my remaining hard drive space I could record 375 hours and 59 minutes of transmissions. That represents about 23 GB of hard drive space.

A data compression option and a simple, but useful, Log function, rounds out the features of Scan Recorder version 1.9. Give it a try at the above website. Since it's a freeware program, what do you have to lose?

❖ Snooping Around

This next program, Snooper, works well for radio monitoring applications, but also is designed for dictation and Email sound files. Vox
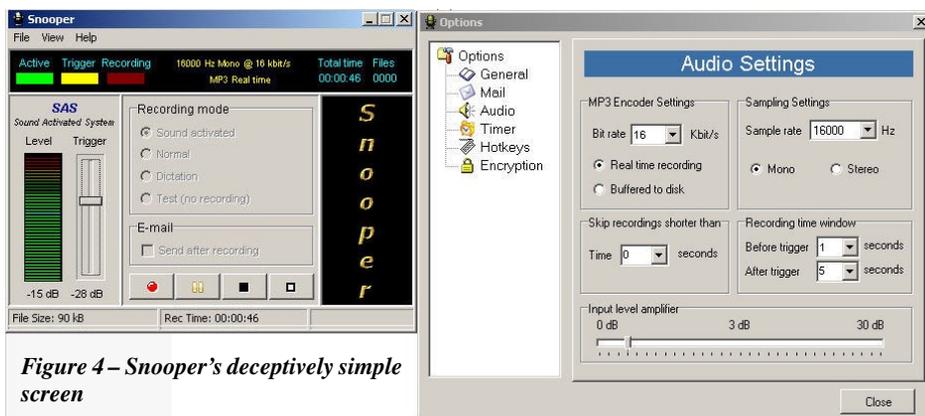
Figure 4 – Snooper's deceptively simple screen
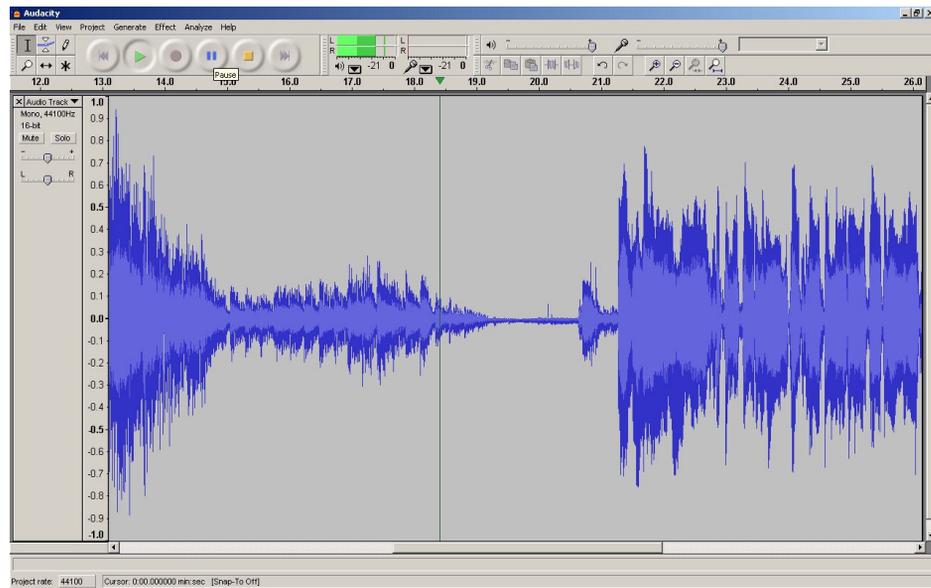
Figure 5 – Audacity, not quite radio friendly but a free useful audio lab

recording, with an adjustable recording window that starts recording before and after the trigger sound, and timed recording is a nice touch of Snooper version 1.35.35.

On the left side of Figure 4 is Snooper's deceptively simple main screen. Mode lights and recording details are shown at the top. On the left is the now familiar input signal level display and the Vox or Trigger level control.

The recording mode is selected from the center region, and typical record controls are near the bottom of the screen. A running readout of the current file size in kB and the file's size in time is at the very bottom. Those are all the controls a basic user needs to use Snooper.

But to show the depth that an advanced user can go to, we have displayed the Option-Audio screen on the right side of Figure 4. Here the Input level of the amplified can be adjusted. MP3 and sampling settings can be modified. And finally we see that the Vox or trigger parameters can be customized. On the left of this screen, we can see a list of the other five Option screens that can be accessed. See what I mean about the deceptive simplicity of the main screen of Snooper?

You can download Snooper version 1.35.35 and use for free for 30 days. $15 will get you a registration key that will remove the time limit.

❖ What Audacity!

Another sound recorder that you should

definitely know about is Audacity. This free program does a great job of audio record, playback and analysis from just about any source. It has simultaneous multi-track capability, which allows most PCs to simultaneously record two tracks without any additional hardware.

The audio editing features of Audacity version 1.2.6 are excellent, making audio editing as easy as text editing. This program has many features, including more than twenty effects that can be added to saved audio. Figure 5 displays a previously recorded off-air file. Notice the clear breaks in transmissions when the graph goes to zero.

The one thing Audacity is missing, unless I missed it, is a voice activated record function. Except for that one important exception, critical for radio use, Audacity would have scored very high in my book.

A feature in Audacity called Silence Finder can be used to automatically label tracks based on seconds of silence. The user can set the "quiet time" sensing period, from 0.1 to 5 seconds. Therefore, it could be used to generate a track for each transmission or sets of transmissions received.

If you are interested in digitized recording of any type you should really give Audacity a try. It's a free download from **http://audacity.sourceforge. net/download/windows** .

❖ That's It

Well, you should be able to find an audio recorder program to your liking from the ones we have tried. Since most have a free trial period or are freeware, give them all a try to find the right one for your radio monitoring. Also keep in mind that many radio software suites, such as Ham Radio Deluxe and RadioMax, include audio recorders. And, finally, remember that most versions of Windows include a basic sound recorder in their Accessories or Accessories-Entertainment folder.

Till next time, remember to take time and "capture the moment."

ALPHA Radio

AOR's flagship professional communications receiver, the AR-ALPHA, is now for sale to qualifying agencies. The consumer version (cellular-blocked) should also be available soon.

Covering 10kHz to 3.5GHz with no interruptions, this desktop or rack mount receiver sets new standards for signal monitoring, signal searching, spectrum display, and signal recording. Featuring wideband receive and advanced DSP technology with a high speed DDS local oscillator, innovative ZERO-IF from the 10.7MHz digital processing, versatile 6-inch spectrum scope with FFT technology, stable OCXO, and I/Q output.

In addition to a wide variety of AM and FM modes, the AR-ALPHA also receives and displays analog TV signals in NTSC, PAL and SECAM formats, APCO-25 digital reception and a Digital Voice Recorder that can capture up to 52 minutes of audio and six channels.

Rear panel connections include 12 VDC power, RS-232C, USB 2.0, I/Q output with 1 MHz bandwidth, two antenna ports (one SO-239 and one Type N) and up to four antennas may be selected through the receiver's controls with the optional AS5000 antenna selector.

Street price for the AOR AR-ALPHA is $10,000; no price is yet available for the consumer model. For more information in a full-color brochure, visit **www.aorusa.com** (email *info@aorusa.com* or call 310-787-8615) or **www.grove-ent.com/aorprofreceivers.html** (email *order@grove-ent.com* or call 800-438-8155)

AirNav RadarBox

AirNav has announced release of its advanced real-time radar decoder. Thanks to next generation Radar decoding, real world aviation is as close as your armchair. By decoding ADB-S (Automatic Dependent Surveillance Broadcast) radar signals, you will be able to see on your computer what real Air Traffic Controllers see on their screens in Real-Time. Flight number, aircraft type, altitude, heading, speed are all updated each second. Included is the award winning software interface developed by the world's leader in flight tracking and monitoring solutions, AirNav Systems.

Watch for the review in *Monitoring Times* in October, or go to **www.airnavsystems.com/radarbox** and order yours today for $899. (S&H included)

The Rest of the Story

Many *MT* readers told us how much they enjoyed Johnnie Craig's October 2006 story, "Swan Island; Visitors Unwelcome." That article was an excerpt from a book Johnnie was writing, and with your encouragement, he has now finished it.

"FAA Electronics Technician Life Style" spans Johnnie Craig's stint in the military, his 30-year career with the FAA (the only civilian government job he could find not subject to the draft) which took him across the entire country, including several years in Alaska.
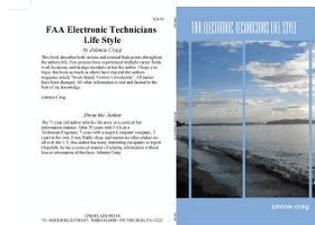
Much of the book focuses on comic or ironic events and Johnnie's continuing search for new challenges (which often turned out to be as much about handling people as technical equipment). As a 10th grade drop-out who ended up being one of the most respected field technicians in the FAA (and who, at age 71, is still on call!), Johnnie rarely did anything "by the book." Johnnie followed his own career advice: "It is very rare to find someone who works hard, tries hard, seeks constant improvement, and is not successful and reasonably happy. Invariably, people who are unsuccessful, got side tracked, stopped trying to improve, or just decided to settle for what they have."

"FAA Electronics Technician Life Style" is a slim 44 pages of good reading. If there is a criticism, it is that it is priced like a technical reference book, instead of the entertaining and informative autobiography it is. "FAA Life Style" can only be purchased on line at **i-proclaimbookstore.com** with major credit cards. (There seems to be no provision to order by mail or by phone.) For $33, you may download the book in Adobe Acrobat, or you may purchase the published book for $38.00 plus shipping ($5.75 to most addresses).

Sound Archives

Radio hobbyists fascinated by sound (and who isn't?) will get a kick out of a new website called Soundsnap. This site contains thousands of sound snippets free for the downloading. Like YouTube, users can also upload their own sound files to add to the library.

Soundsnap audio files are free to be used by sound designers/recordists and music producers, film-makers, web designers and video game developers. It can also be useful to hobbyists for their home videos, people looking for ringtones and anyone else that needs sounds. (Pirate radio and radio drama come to mind...) Soundsnap was started by Tasos Frantzolas, a young sound designer living in Athens, Greece.

I searched on "radio" and found sounds from CB, scanners, shortwave, and mediumwave, but the site hasn't even scratched the surface when it comes to interesting sounds on shortwave. *MT* readers, this site needs you! Check it out at **www.soundsnap.com**

World QSL Book

Teak Publishing has announced the release of its first e-book – *World QSL Book*, 1st edition. The book is written by *MT's QSL Report* columnist Gayle Van Horn, W4GVH, and represents the first comprehensive publication of its kind devoted to QSLing radio stations in the HF radio spectrum.

What's New will run a full review of the book, published in Adobe Acrobat (PDF) on CD-ROM, next month. However, just knowing the book runs 475 pages in length guarantees that it is loaded with station addresses, internet websites, and email addresses. Coverage includes shortwave broadcasters (including clandestine and pirate stations); HF utility stations (civilian and military); and amateur radio QSL bureaus worldwide.
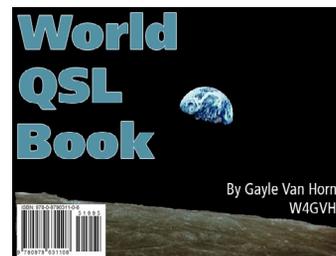
World QSL Book e-book is available from Teak Publishing, P.O. Box 297, Brasstown, NC 28902, *teakpub@brmemc.net*. It is also available from Grove Enterprises (800-438-8155). Cost is $19.95 plus shipping and handling. Contact Teak Publishing at the email address above for additional ordering information.

Stock Exchange

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Foreign International*	❏ $30.75*	❏ $58.50*	❏ $114.95*	❏ $171.50*
Electronic Subscription		❏ $19.95	❏ $38.90	❏ $57.85

*All payments must be in U.S. Funds drawn on a U.S. Bank!

Attention all those wanting to know what's going on with ham radio in the New Orleans area, check out: **http://groups.yahoo.com/group/GNOAmateurRadio/**

Blogs offer an opportunity for columnists to share information that does not make their columns. The news might be too timely for deadline, too short, confined to a small geographical area, too far away to be heard in North America, or even off the columnist's regular "beat." Bookmark these blogs for frequent visits!

MT: AMERICAN BANDSCAN
http://americanbandscan.blogspot.com/ - by Doug Smith
MT: EDITOR'S DESK
http://mt-editor.blogspot.com/ - by Rachel Baughn
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