Scanning - Shortwave - Ham Radio
Equipment - Computers - Antique Radio

Monitoring Times

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MT Reviews:
Uniden BCD996T Scanner
Icom ICR-PC1500
Wideband Receiver

HEAD-EM UP AND MOVE EM OUT
SCANNING GUIDE TO COWTOWN

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Tuning in Major League Baseball

Scanning Charleston SC

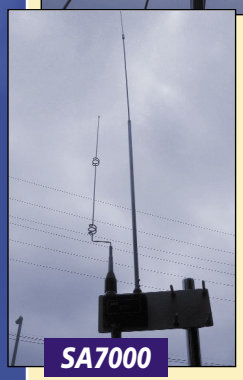
AOR, the Authority on Radio Makes MORE Than Great Radios!

Discover these Accessories & Add to your Capabilities.


DA3000

Antennas for the Great Outdoors

DA3000: a 16 element receive wideband discone antenna with useable frequency coverage from 25MHz to 2GHz. Using different length elements to ensure true wideband characteristics, the DA3000 also includes one 'loaded' element to enhance low frequency performance. Engineered and manufactured to AOR's exacting standards, the DA3000 comes with 50 feet of quality RG58/U coaxial cable terminated in a BNC plug for the radio connection and a low-loss TNC plug in the antenna base. Pole clamps are also standard.


SA7000

Designed for areas where space is a problem or when an "unobtrusive" installation is essential, **SA7000** is a super wideband coverage receive antenna with useable frequency coverage of 30 KHz to 2 GHz. The SA7000 is a passive arrangement with two whip elements: a long element for short wave up to 30 MHz and a second shorter loaded whip antenna for frequencies up to 2 GHz. The loading coils are tuned around 150 & 800 MHz to enhance VHF & UHF performance.

Antennas for Indoor Enjoyment

AOR has made performance even better with the new **LA380** indoor antenna as successor to the popular LA350. The LA380 features full frequency coverage (40KHz – 500MHz) using a single receiving element. Designed to provide reception when away from the main monitoring location or when large external antennas are not practical, the LA380 is a compact active (1 foot diameter) loop antenna which features an internal high-gain amplifier (20dB for 40KHz-250MHz) and excellent overall strong signal handling (high IP3 +10dBm). The loop design allows directional control and nulling noise or interference. Perfect for listening in remote locations or in antenna-restricted areas.


LA380

Accessories for Added Monitoring Capability


P25-8600 APC025 Decoder

Now you can monitor APCO 25 signals using an AR8600MKII. The **P25-8600 APCO25 Decoder** can be installed in the AR8600MKII receiver to automatically decode the APCO25 signal. The decoded audio is then output from the receiver's speaker. *(Installation is required.)*

TVA-1 External NTSC TV Converter

The **TVA-1 External NTSC TV Converter** is compact, lightweight and easy to install. Designed to be used with the AOR AR5000A series of communications receivers, its simple operation uses the 10.7 MHz IF input from your receiver. Audio and video outputs allow monitoring a variety of sources such as broadcast TV, public safety agencies, aircraft, Amateur Radio FSTV, news media video and more.


TV5000A NTSC TV Internal Converter

The **TV5000A NTSC TV Internal Converter** adds the ability to receive broadcast television signals (NTSC) and allow monitoring video feeds from a variety of sources including broadcast TV channels, public safety agencies, aircraft, Amateur Radio FSTV, news media video and more when used with AOR AR5000A series of communications receivers.

TV2000 External NTSC Video Decoder

The **TV2000 External NTSC Video Decoder** is designed to be used with the AOR SR2000. Compact and lightweight, no external power supply is required (power is supplied from the SR2000). The video output is available from the rear panel of the TV2000 and audio is provided from the SR2000 through the external speaker jack.

AOR®
Authority on Radio Communications

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20655 S. Western Ave., Suite 112, Torrance, CA 90501, USA
Tel: 310-787-8615 Fax: 310-787-8619
info@aorusa.com http://www.aorusa.com

Specifications are subject to change without notice or obligation

For more great accessories, visit the website at www.aorusa.com.

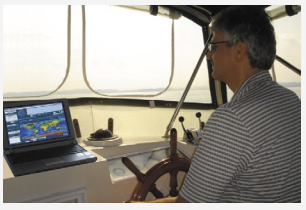
The choices are yours at WiNRADiO.

At WiNRADiO, the innovation never stops.

This month we are pleased to introduce our two new products: The WR-G33EM USB-based marine receiver and the WR-G305i PCI-card-based VHF/UHF scanning receiver.

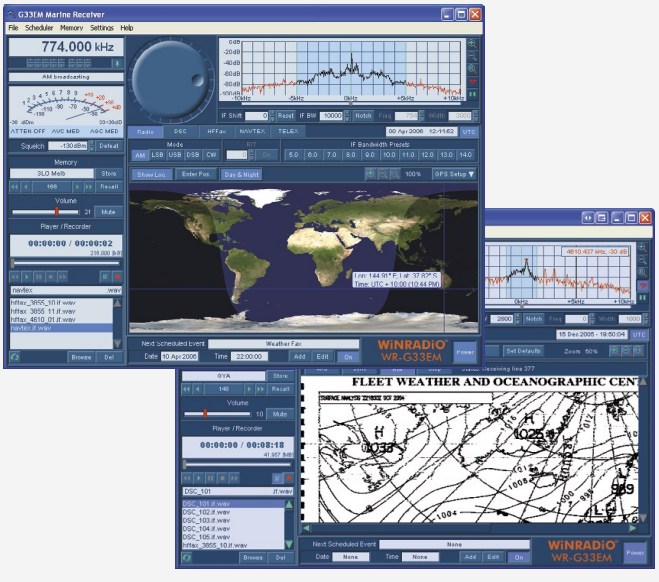
WR-G33EM USB-based Marine Receiver

- Frequency range 9 kHz to 30 MHz
- AM, LSB, USB, DSB, CW classic modes
- DSC, HF Fax, NAVTEX, TELEX marine modes
- GMDSS monitoring
- Very high sensitivity
- Excellent dynamic range
- Real-time spectrum analyzer
- Spot-on tuning in 1Hz steps
- Variable bandwidth 100 Hz - 15 kHz
- Automatic scheduling, recording and playback



The WR-G33EM receiver easily outperforms a conventional receiver, thanks to advanced signal processing techniques making it possible to implement sharper selectivity filters with more accurate demodulators and decoders.

The main strength of this product is in its close integration of many useful functions in an easy to use, powerful yet affordable package. The G33EM replaces five or six separate pieces of conventional equipment - and does the job better.



WR-G305i VHF/UHF Scanning Receiver

- 9 kHz-1800 MHz frequency range
  (except cellular bands where required by law)
- Optional 3300 MHz downconverter
- Tracking front-end filters
- Dual-loop AGC and AFC
- Software-defined demodulation
- Excellent sensitivity
- Fast scanning speed
- Multiple squelch modes
- Real-time spectrum analyzer
- Powerful software features
- Standard PCI card
- Plug and Play installation

The WR-G305i receiver represents the first commercially available VHF/UHF scanning receiver on a PCI card. It is also a software-defined receiver, where the last intermediate stage and all-mode digital demodulator are executed entirely in software, with easy upgradability and performance typical of receivers costing many times more.

Similarly to the WiNRADiO award-winning G3-series of HF receivers, this VHF/UHF receiver is about to change this industry forever.

For more information about these remarkable receivers, visit:

www.winradio.com

...the future of radio.™

Monitoring Times

Vol. 25, No. 7 July 2006

Cover Story

A Scanning Guide to Cowtown

By Gayle Van Horn

If you get the urge to "head 'em up and move 'em out," you should consider a trek to Fort Worth – a city where cowboys and high tech happily coexist deep in the heart of Texas. This spring our author did just that – except she called it "going home."

Forth Worth has a colorful history, but it has definitely entered the modern age. Both Tarrant County and the city of Fort Worth are covered by two major trunk radio systems. We've rounded up all the frequencies and talkgroups for you for the Public Safety system and the smaller system which supports county and city services. Story starts on page 8.

On our cover: Don't miss the daily cattle drive at the stockyard for a taste of the Old West. Photo by Larry Van Horn.

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Scanning the Holy City..... 12
By Mark Cleary

No, we're not talking about the Vatican, but a place closer to home – Charleston, South Carolina. A major tourist destination, Charleston has a little something for everyone – history, shopping, culture, golf, boating and beaches. It also boasts two Motorola Smartnet trunked radio systems to keep radio hobbyists happy – one for the city and one for the county of Charleston, including a great deal of maritime traffic.

You'll also find a number of active conventional frequencies for aviation, national parks and forests, and military traffic. It's all covered in this comprehensive article, so what are you waiting for? Come on down!

Tuning into Major and Minor League Baseball..... 17
By Ken Reitz

These days, listening to the "all-American pastime" can be done over AM radio, satellite radio or on-line. You may need all three to catch the games, depending on what you want to hear. If you're determined to listen the old-fashioned way via AM radio, the author has a few tips on equipment to get you that extra mile. And, of course, we've updated the annual list of flagship stations for major and minor leagues.

"Signal Stalking" at the Ballpark..... 19
By James Adkins

There's a lot more action at the ballpark besides just what you see on the diamond. If you brought your scanner with you, you may catch action on the usual public safety channels, but what signals might you be missing? Using a scanner with "Signal Stalker" capability, the author could find the activity without waiting for a programmed frequency search to find it by chance.

Reviews

"A Marvel of 21st Century Scanning Technology!" is our reviewer's assessment of the new **Uniden BCD996T** base/mobile scanner. Earning nearly five stars, Larry Van Horn can find virtually nothing to improve in this top performer (see page 70).

Icom recently updated one of John Catalano's favorite wide-coverage receivers, so he's happy as a lark playing with the new Icom **IC-PCR1500** computer-controlled receiver. See page 68 to see how it works.

John Catalano just discovered a free software program from Honey Soft. **ICOM_OKA** is a terrific logging and control program for Icom transceivers and receivers. See page 72 for his review.

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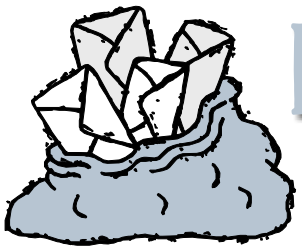

LETTERS TO THE EDITOR

We Have a Winner!

In our March Aviation issue, *MT* reviewed the Kinetic Avionics SBS-1 Real-Time virtual Radar. This receiver and software, when used with a computer or laptop, is capable of receiving and decoding Mode-S and Automatic Dependent Surveillance Broadcast (ADS-B) signals from aircraft and displaying location and flight information similar to a radar display. The SBS-1 is a cost-effective alternatives for small airfields, but it is also becoming very popular among plane-spotters in Britain (where the unit is manufactured) and is now making its debut on this side of the pond.

Kinetic Avionics and distributor Martin Lynch & Sons donated the review unit to be given away. Rather than make it a simple drawing, we asked entrants to write a short essay describing their hobby and how the SBS-1 would contribute to it. The contest was judged by Rachel Baughn (editor), Larry Van Horn (assistant editor), and Lee Reynolds (equipment reviewer). Our choice was unanimous: we selected the Air Victory Museum in New Jersey to receive the SBS-1. I think you'll understand why when you read their entry.

By the way, ML&S wanted you to know they have a new US distributor who carries the SBS-1 and related accessories: ENIcommunications Corp, 70 Brookside Road, Randolph, NJ 07869; Contact: Mark Philips, sales@enicomms.com; Tel: 973 828 1625

Now here's our winner:

Air Victory Museum

We would like to introduce you to the Air Victory Museum. We are a 100% volunteer 501c3 non-profit educational museum dedicated to education through aviation. We are located at South Jersey Regional Airport, a small airport in Central New Jersey.

All of the volunteers are interested in aviation and there are always scanners tuned to the local aviation frequencies. This gives our young visitors a rough idea of what the pilots are transmitting and gives the volunteers a heads up when a unique plane is coming in.

To try and explain how we all got involved with radio and computer equipment would take a great many pages. We span the time frame of WWII veterans to teens. All of whom are involved with the museum and you can usually find them by listening to the chatter from the scanners they have with them. We have everything from an old Bendix to Bearcats that provide us with aviation information.

We are submitting an entry for the SBS-1 Virtual Radar, because we feel that it would be a great addition to the Museum. An addition that we cannot afford to put in without outside assistance. The Museum is funded only by memberships, donations and the admission fee we charge. We get no support from any State or Federal agency. Due to our very limited funds the volunteers have to find unique ways to present the information that we want our visitors to have access to. There is a section of the Museum that is dedicated to introducing the young and not so young to various aircraft, how airplanes fly, and the equipment that pilots use through up-close displays.

The SBS-1 would give us a fantastic display that would allow us to show our visitors exactly what radar does. Just picture the excitement that this display would produce compared to just looking at static pictures. We have radar units, scanners and pictures. You could help us add a whole new dimension to the learning process with the SBS-1. What better promotion could a product have than to say it is used to help educate young people who may go on to become tomorrow's engineers, pilots and aviation scientists?

We thank you for considering our entry and invite you to view our web-site for a quick overview of what we offer. Submitted by the men and women who are dedicated to giving families a first rate affordable educational museum of flight.

Evelyn Waters, Registrar
Air Victory Museum
68 Stacy Haines Rd.
Lumberton NJ 08048
info@airvictorymuseum.org

We encourage you to visit the website at **www.airvictorymuseum.org** and see some samples of the aircraft and events sponsored by this ambitious museum. We also encourage you to visit **www.SBS-1.co.uk** (or call their new US distributor) to order your own Virtual Radar and to check out some of the new products and upgrades offered by this innovative company.

Honorable Mention

All the entries into the SBS-1 contest were impressive. So much so, we decided to award an *MT Express* subscription to two runner-ups. Here are excerpts from their entries as well:

"Mike Juliet downwind to land" – it worked.

Using my pocket money, I had just purchased an EZ-build VHF converter, which according to the advert in the aviation magazine would allow you to hear the Air Traffic tower and the drama in the skies. It was a simple regenerative mixer, which you had to place next to a broadcast radio and adjust two controls, the gain and the frequency dial to receive aircraft radio conversations. Following much adjustment, I had succeeded in listening into the British Airways BAC 1-11 G-AVMJ carrying out crew training at my local airfield.

This was back in the 1960s when, as a kid, I lived under the circuit pattern of a large military transport base in the United Kingdom. Always interested in watching aircraft, I needed a way of knowing when interesting planes were arriving, especially at night; were they going to stay or just do an overshoot and depart? This was especially important, as it was a 6-mile cycle ride just to get to the end of the runway with my camera.

After the initial euphoria, the limitations of this solution became apparent. I next purchased a multi-band radio, which was much more stable and had much better reception. I could hear the tower and also aircraft in the airways overhead. I also discovered from fellow enthusiasts that you could tune to the harmonics of the UHF air band and pick up the calls from the military aircraft. This opened up a whole new world of exciting monitoring, aircraft arriving low on fuel, carrying out talk downs on a stormy night.

This interest and knowledge gained in aviation and radio listening led to my chosen career

path, where I ended up developing air traffic communication systems for the UK equivalent of the FAA and other telecommunications companies. I also worked as an ATC engineering consultant, helping emerging nations establish safe ATC systems and landing aids, and eventually ended up in the USA working for a major aeronautical communications provider.

During this time, my list of radios grew from ham radios, to air band transceivers as I learnt to fly and owned a share of a homebuilt long EZ aircraft. I still listen and watch aircraft landing on 9R at ORD using my AOR 1000 handheld, and watch traffic overhead by decoding ACARS.

What would I do with the SBS-1 if I won? Obviously, it would continue to help answer that question I first identified 40 years ago. What interesting aircraft are coming in to my local airfield, and can I get there in time to take a picture?

My other planned use is that it would also enable me to evaluate the product in more detail and experiment with some software applications. I believe that a product such as the SBS-1 could help solve some of the ATC safety issues I worked on 10 years ago in Africa and Asia.

– John Pumfrey

I began my radio "career" in junior high school. With cotton jacket wire and a few parts and pieces, I made my first radio – a crystal controlled receiver – and began tuning in the world. My passion led me to create a radio in a book installation, because my Dad caught me up nights listening to the "world bands."

When I was in high school, I studied just about everything I could get my hands on that related to radios and communications. At the urging of a Veteran I met while working in the National Veteran's Hospital and Soldier's Home, I passed my novice amateur radio exam, then proceeded to build a Heathkit radio. My parents were tickled to see me win top honors in the Washington DC schools Science Fair with my radio projects.

Fast forward: I found *Monitoring Times* in a news rack while in college in Raleigh. It sparked my interest in radio again. I found an old scanner and began acquiring radio equipment and my love for radio was reborn. I became involved in volunteering for a local fire department and building up a frequency list for just about everything I could hear on the air waves.

During college one of my many jobs was baggage handler and fueling planes with Delta airlines; boy, talk about monitoring radio heaven! I received a recreational pilot certificate and that fueled my passion for finding more about communications systems, monitoring signals and providing communications assistance for disaster/emergency relief.

Living now in the Washington DC metropolitan area is the "candy store" of communications. I monitor aviation, public safety, short wave and just about every form of transmission possible.

Currently, I have retired from the Fire service, and serve as ARRL Section Emergency Coordinator for the Maryland/District of Columbia, Navy Marine Corps MARS, National Communications Systems SHARES, and Skywarn Net Control. I recently received my private pilot certificate, and live under the ADIZ for the Washington DC area, where I monitor the CTAF frequencies of most of the area airfields. I also support the public safety communications system as a liaison for the many agencies in the area, providing coordination and management during multiple disciplinary applications.

I hope to use the SBS-1 to provide resource management, emergency/disaster management and regional support for government and private sectors. The SBS-1 could be used to give situational awareness for field deployed operations and also allow me to keep my "ears to the sky" for my passion of flying.

I enjoy tuning in on the world, getting news by short wave, DX to other countries, monitoring public safety and air traffic communications. For a hobby that began as a kid with a cardboard tube radio with a long wire, I think radio is serving me well.

– Douglas Lindsey Jr, KB3HER/NNN0PXJ; ARRL SEC MD/DC; NAVMARCORPSMARS MDE; NCS SHARES; APCO International

This page is open to your considered comments. Opinions expressed here are not necessarily those of Monitoring Times. Your letters may be rephrased or shortened for length and clarity. Please mail to Letters to the Editor, 7540 Hwy 64 West, Brasstown, NC 28902, or email editor@monitoringtimes.com

Happy monitoring!
- Rachel Baughn, KE4OPD, Editor

COMMUNICATIONS

THE COMING STORMS

Hurricane Season

As we enter the 2006 hurricane season, organizations, special commissions, and state and federal organizations are still publishing reports on what went wrong during last year's devastating storms and analyzing the current state of preparedness.

The 750-page "Hurricane Katrina: A Nation Still Unprepared," issued in late April by the Senate Homeland Security and Governmental Affairs Committee, added some details to the now-familiar story. The panel found that back-up equipment arrived late or went unused, and private firms were often more adept at meeting the challenges than were state and federal agencies. One of its main recommendations calls for the Federal Emergency Management Agency (FEMA) to be dismantled and restructured.

The House is considering legislation to fix the Federal Emergency Management Agency. Policy-makers reviewed the proposed National Emergency Management Reform and Enhancement Act of 2006, a bill boosting FEMA's strength. The bill would beef up FEMA by creating the position of an undersecretary to head the agency. The bill would establish regional offices to coordinate efforts with state and local officials and emergency response providers, instead of having decisions come from Washington, D.C.

FEMA reports several major changes in preparation for hurricane season. Pre-positioning of commodities will be better coordinated with disaster-prone states, and the states are responsible for distribution. A new program for tracking inventory being trucked will use GPS to provide real-time location information. Special federal advance teams will be outfitted with video cameras to provide live feeds from a disaster zone back to headquarters. FEMA also plans to have trained 3,000 temporary workers by the end of summer 2006.

Some of the logistics, tracking, and rations are coming from the military, which says it will take its orders from FEMA. Logistics planning is done at the Defense Logistics Agency, based at Fort Belvoir, Va., and U.S. Northern Command, in Colorado Springs, Colo. will oversee the movement of troops, aircraft, vehicles and supplies supporting relief efforts. Improved communications between local and national relief officials, including portable radio systems, are being readied, and a joint Air Force, Coast Guard and National Guard search-and-rescue center is planned.

The 53rd Weather Reconnaissance Squadron is the military's Hurricane Hunters, based at Keesler Air Force Base, near Gulfport, Miss., which is still recovering from Katrina. The Air Force is flying 10 new hurricane-tracking planes, the WC-130J model, with improved weather instrumentation and better crew comfort. The National Oceanic and Atmospheric Administration flies its own hurricane-searching planes from MacDill Air Force Base in Tampa, Fla.

The state of communications interoperability in the coastal states and across the country is improving but has a long way to go. Department of Homeland Security Secretary Michael Chertoff has said that successful interoperability requires three things: training on proper use of equipment, improved policies so commanders from different departments and agencies can communicate, and technology standards for equipment. DHS will be conducting a thorough review and report later this year. DHS has not completely endorsed the APCO25 set of standards yet because they are not complete. This month's *Scanning Report* ("Federal Report Cards," page 25) provides an excellent summary of the Department of Homeland Security's statements on interoperability and the First Response Coalition's review of communications preparedness in eight coastal states prone to hurricanes.

As always, to find the most up-to-date frequency information to follow hurricane-related communications activity, go to Hugh Stegman's *Utility World* site at **www.ominous-valve.com/hurricne.txt**

Amateurs at Work

The contribution of Amateur Radio Operators following the 2005 hurricanes was a noteworthy success. However, an ad-hoc ARRL National Emergency Response Planning Committee has been established in order to create a comprehensive recommendation for ARRL responses to large-scale regional, national and international disasters. The committee's mandate is not limited to hurricanes, so its membership includes individuals with direct field experience in all aspects of emergency communications at various levels during disasters including earthquakes, wildfires, floods and terrorist activity.

The ARRL encourages amateurs, "If you haven't done so already, take the Amateur Radio Emergency Communications Courses offered by the ARRL. Sign up with your local ARES group – ARECC certification is not a prerequisite, but you'll be a more valuable volunteer if you do."

New Mexico decided amateur radio is so useful, it has allocated $500,000 to design, construct and install a statewide Amateur Radio emergency communication network. Early plans call for the installation of strategically located, interlinked VHF and UHF repeaters to handle both voice and digital communication.

Moorpark High School, Ventura County, Calif., is offering the nation's first disaster-preparedness class, RADIO (Radio Amateurs and Disaster Operations). The year-long class will train students in CPR, first aid, student emergency response training, and amateur radio.

Storm Watching

Further inland, the threat of tornados is the bigger danger during storm season. Skywarn Spotters may be called out day or night year-round, gathering much-needed details of bad weather, including its aftermath. They fan out to assigned posts to scan the sky for signs of danger. Being a ham-radio operator is helpful but not a prerequisite to be a spotter. All you need is to complete a few hours of training led by a weather-service meteorologist, in which you learn storm signatures and cloud formations.

Local storms are initially tracked by the weather service's Advance Weather Interactive Processing System by radar. But the radar is beamed in a straight line, moving away from the earth's curvature, which means the only way to know exactly what clouds in the local area look like is for someone to be watching and reporting. To find a local group or training materials go to **www.skywarn.org**

Public Emergency Network

The Midland Radio Corporation, REACT International, the DC Emergency Radio Network, and NationalSOS.com have jointly announced their support for the National SOS Radio Network – **www.NationalSOS.com** – a free communications network based on the estimated 100 million FRS-compatible radios already in the hands of the public.

Whether the cause is a hurricane, tornado, wildfire, or spring flooding, when electricity, telephone and cell phone services fail, people are unable to let rescuers know of their emergency situations. The purpose of the National SOS Network is to connect Family Radio Service (FRS) and GMRS (General Mobile Radio Service) users with 700,000 ham radio operators.

The National SOS initiative recommends that the public use FRS Channel 1 as a primary emergency-communications channel. Channel 1 is easy to remember and has previously been endorsed by radio manufacturers and by REACT International. During a crisis, ham radio, GMRS and scanner operators can monitor FRS Channel 1 by listening to 462.5625 MHz. When a cry for help is received from an FRS radio, emergency responders can be notified.

Bill Adler, the founder of the DC Emergency Radio Network, DCERN, said, "It's my vision to see that every household in American has an FRS or GMRS radio." Adler continued, "The

idea behind this new emergency network is to have a simple, reliable communications system that doesn't depend on electricity or standing cell phone towers – and that anyone of any age can use."

For more details regarding the National SOS Radio Network, please visit: **www.NationalSOS.com**.

NEWS BITES

Goodbye, Vint Hill Farms

Vint Hill Farms Station, an outdated Army post located near Warrenton, Va., will "die" this fall, a casualty of the end of the Cold War. Why is this of interest to *Monitoring Times* readers? Because in 1984 the area around Warrenton was determined by a persistent *MT* reader to be the source of 4-digit English and Spanish "spy numbers" transmissions – a bit of a coup in those days of government denial.

Whether Vint Hill was connected to the National Communications System Warrenton Training Center to which the signal was tracked is unknown, but it seems likely. Acquired by the Army in 1942, Vint Hill Farms Station was used for intelligence-gathering operations and training of radio-intercept operators, cryptanalysts and technicians. The installation's mission focus changed in 1974 when it shifted toward research, development, and logistical support of intelligence and electronic warfare. It was placed on the Base Realignment and Closure list in 1993.

Employing more than 2,000 military members and civilians, most of its employees will be transferred to Fort Monmouth, N.J., while others will be reassigned to Tobyhanna Army Depot, Pa., and Fort Belvoir, Va.

Senate and House Look at Telecommunications Laws

In early May, Ted Stevens, chairman of the Senate Commerce Committee, released a 135-page draft of the "Communications, Consumer's Choice and Broadband Deployment Act," a sweeping rewrite of laws dealing with video, satellite and broadband communications.

Stevens' proposal includes such contentious elements such as audio broadcast flag, broadband taxes, child pornography, municipal broadband, net neutrality, video broadcast flag, and VoIP providers. Stevens announced plans for two hearings, but the rewrite process is expected to be a long one.

Meanwhile, the US House Energy and Commerce Committee's version of the Communications Opportunity, Promotion and Enhancement (COPE) Act of 2006 "telecoms rewrite" bill is headed to the full House for consideration.

The House bill includes an amendment requiring the FCC to study the interference potential of Broadband over Power Lines (BPL) systems, proposed by Rep Mike Ross, WD5DVR (D-AR). The COPE Act BPL amendment adds a section (under Title V) to the proposed legislation that would require the FCC to study and report on the interference potential of BPL systems within 90 days of the bill's enactment. The Commission would have to submit its report to the House Committee on Energy and Commerce and the Senate Committee on Commerce, Science and Transportation.

"This puts the House Energy and Commerce Committee on record as having concerns about BPL interference," the American Radio Relay League said. "If we are vigilant in protecting it against deletion on the House floor – assuming the bill is approved by the House – the BPL language will be included in the legislation that goes on to the Senate."

Night of Nights

If you're interested in the heritage and history of maritime radio, please draw a circle around 12 July on your calendars. That's the date of the 7th annual "Night of Nights" when KPH, KSM, and several other stations and ships will return to the air to commemorate the last day of commercial Morse in the US. Several of the ships and coast stations will be operating on MF as well. Watch the **www.radiomarine.org** website for an announcement with call signs, frequencies and time information. *(Richard Dillman, W6AWO, Maritime Radio Historical Society)*

Communications is compiled by editor Rachel Baughn KE4OPD (editor@monitoringtimes.com) from newsclippings submitted by our readers. Many thanks to this month's fine reporters: Anonymous NY; Harry Baughn, Martin Brooks, Mark Cobbeldick, Bob Fraser, Bob Grove, Sterling Marcher, T Martin, Jack Nesmith, Jerry None, Michael Perlman, Ken Reitz, Doug Robertson, Brian Rogers, Larry Van Horn, Ron Walsh, Ed Yeary

Head Em Up, Move Em Out - A Scanning Guide to Cowtown

By Gayle Van Horn, W4GVH

There are people who will tell you that in Texas everything is bigger, better and taller, and some of that might be true. They are just as likely to tell you that we Texans take our football, barbeque and politics very seriously, and that is definitely true! Maybe it's the *Don't Mess With Texas* slogan, but being a Texan is truly a state of mind.

Larry and I recently traveled to the wide open spaces of our home state and came across some interesting scanner finds while in Fort Worth, a city where cowboys and high tech happily coexist deep in the heart of Texas.

Once a major stop among trail drivers, the Chisholm Trail ran down what is present-day downtown Fort Worth. In 1849, Army General William Jenkins Worth, hero of the Mexican War, proposed a line of ten forts to mark the western Texas frontier from Eagle Pass to the confluence of the West Fork and Clear Fort of the Trinity River. When Worth died that same year, the United States War Department officially named the post after General Worth.

During the 1860s Fort Worth suffered the effects of the Civil War and Reconstruction, and the population dropped as low as 175. Gradually the town began to revive as banks, saloons, and stores welcomed travelers and settlers. It was the developing cattle industry, however, that really began the community's economic boom. Known as Cowtown, Fort Worth offered cowboys a respite from the cattle drives to Abilene, Kansas.

In 1874, the first westbound stage arrived. The Texas and Pacific railroad was finally completed to Fort Worth on July 19, 1876, and with it Fort Worth's status blossomed as a major shipping point for ranchers. By the 1890s, the Queen City of the Prairie, as Fort Worth also liked to be known, was becoming a dressed-beef center. Businessmen of the city founded the Texas Dressed Beef and Packing Company, the Union Stockyards Company, and the Fort Worth Stockyards Company.

During World War I, the United States Army established Camp Bowie in the Arlington Heights area and converted three airfields into centers of aviation training. With the discovery of oil in Texas, refinery and pipeline companies such as Sinclair Refining Company, Texaco, and Humble Oil and Refining Company (later known as Exxon) converged on Fort Worth, which developed into a center for oil stock exchanges. In 1927 Meacham Field opened, offering commercial and passenger service from locally operated Braniff Airways and American Airlines.

With the outbreak of World War II, the aviation industry came to Fort Worth. Consolidated Vultee Aircraft Corporation, the largest manufacturer in Fort Worth, was later bought by General Dynamics Corporation. Next to the bomber factory was the Army Air Base located at Tarrant Field Air Drome, which in 1948 became Carswell Air Force Base and today is known as NAS/JRB Fort Worth, Texas.

Since World War II, Forth Worth has prospered to a thriving city that has retained its western flavor as the city where the West begins. Billy Bob's – a three-acre nightclub – remains a popular draw in the Stockyards District, while NASCAR and Indy race fans pack the stands at Texas Motor Speedway. From cowboys to culture, you're in for a big surprise in Fort Worth.

Just as interesting as the city's birth as a settlement in the shadow of Camp Worth, the history of *policing* this roaring cowtown is a story in itself.

Law and Order Come to Cowtown

With a steady stream of cowboys passing through the area, all were in need of supplies and recreation before taking their herds to Kansas. Recreation meant all-night saloons and gambling houses. By 1876, "Longhair" Jim Courtwright, a performer in Wild Bill Hickock's Wild West Show, was given the difficult task of policing this roaring cowboy town. "Longhair" successfully reduced the number of killings in Fort Worth, a town where liquor and money flowed, much to the delight of many a merchant or barkeeper. Courtwright created the town's first "police force," and reduced the number of killings to less than at any time before or since.

After Courtwright's departure, the Police Department continued to grow and the first detective was appointed in 1883. In 1887, the first permanent force was created, consisting of two mounted officers, two patrolmen, one jailer, and two sanitary officers.

In 1905, the Department joined the Texas Bureau of Information for the bargain price of twenty-five dollars and hired their first police matron the next year. The first automobiles were mingling with the horses and wagons, creating a new phenomenon – the traffic jam! The Department's

first motor vehicle went into service using a five horsepower Indian motorcycle, and introduced yet another innovation – the traffic ticket.

During the Twenties and Prohibition, and the depression-era Thirties, the Department continued to grow and build a respectable nationwide reputation, including the demise of the Clyde Barrow gang. The first Radar Speed Check was introduced in 1954, sending a roar of protest over police "speed traps," which ultimately became an accepted tool of the Police Department.

For many years after the advent of the squad car, two officers were assigned to each unit, but on October 1, 1959, the one-officer patrol was initiated on all beats and the shotgun became the one officer's new partner.

New Challenges for the Department

New programs ushered in during the Sixties included the Police Crime Laboratory in 1961, followed by the Foot Patrol. The presence of a foot patrol officer walking the streets downtown gave people ready-access to officers on patrol. A Neighborhood Crime Prevention Team was created, as well as a Drug Abuse Prevention Project to combat an advancing drug problem of epidemic proportions.

In 1986, Chief Windham initiated monthly forums with the community that continue today. The forum process has proven to be successful in developing a responsive, community-oriented police department.

By the close of the 1990s, community policing in Fort Worth yielded a 24 percent crime reduction. The Citizens on Patrol program, organized by the police department and community leaders, has succeeded beyond everyone's expectations.

Today, the Fort Worth Police Department is organized into six bureaus: Executive, North/West Field Operations, South/East Field Operations, Administrative Services, Special Services, and Operational Support. Work is then split into more specialized units. The department covers the city with 75 beats in 12 patrol districts.

The thriving city is a far contrast to the days when Jim Courtwright's reputation as a lawman was enough to make many men think twice before doing something that might draw the Marshall's attention. But most of the police work today is done as in older days – that being, one officer answering a citizen's call for assistance and preserving the peace.

A Volunteer Fire Brigade

The growing migration of cattle drivers, homesteaders, and desperados brought a new set of problems. The Texas and Pacific railroads also doubled Fort Worth's population. Destructive fires were commonplace, due to flimsy wood buildings and tent cities heated by fireplaces and wood stoves. Captain Buckley B. Paddock, a Confederate officer during the Civil War and self taught lawyer, realized that a city defenseless against fire had no future for commerce and culture. Despite unsympathetic townspeople, Paddock's publicly mounted campaign convinced the city fathers to support, at least in theory, his volunteer fire company. Hook-and-Ladder Company One became a reality on May 2, 1873.

Beginning with 60 members, the fledgling company staged fund raising events to finance funds for a hook-and-ladder wagon. The wagon arrived in Dallas by rail and was pulled 40 miles to Fort Worth by a proud group of volunteers. But as the population increased, so did the demand for fire protection. They acquired a Sinsby steam pumper, which could build a good head of steam four minutes after a fire was ignited within the steamer's box. One minute later, the first signs of water appeared from 100 feet of rubber hose. It was now possible to deliver a deluge of water into the heat of a fire without relying on inadequate manpowered pumps.

The 1880s brought more growth to the Fort Worth Fire Department (FWFD), including major thoroughfares, horse drawn carriages, and a water works system with six miles of main and hydrants flowing a water capacity of four million gallons a day. The fire department received the state's first electrical fire alarm system, decreasing response time. On November 30, 1893, Fort Worth's first salaried fire department reported for duty with 34 members.

The custom of painting FWFD fire apparatus white began during the era of Chief Jim Maddox (1901-1905). Fire station five spiffed up the old wagon with white paint striped with gold lettering and represented Fort Worth in the annual fire competition. When station five won as the fastest pump crew, the FWFD has painted all of their fire apparatus white ever since.

By 1919 the department's transformation from horse-drawn hook-and-ladder to motor driven auto pumpers was complete. The city had purchased ten bright white trucks with gold lettering and stripes. Stations were added as well as improved salaries, increased off-duty time, and firefighting was transformed into a career.

The Great Depression of the 1930s and World War II increased the municipal limits to one hundred square miles, and the department struggled to keep up with the increasing demands for its services. Prior to WWII, the department purchased six new 750 gallon-per-minute (gpm) "Mack" pumpers. By the end of the war, two new American-LaFrance 100-foot aerial ladders, four-hose ladder combinations, four pumpers, and three 1,000 gpm pumpers were added.

Public relations campaigns in the 1950s and 60s promoted fire prevention. In 1961, a twelve man squad was established to aid the increasing number of residential and industrial accidents. Squad Two, as it was called, became the cornerstone for Fort Worth's Emergency Medial System (EMS). That same year an underwater search and rescue team was organized, and it still remains a group of highly trained and motivated personnel today.

During the leadership of Chief H.A. Owens (1962-1969) a fifth district was added along with eight new fire stations, plus a third platoon system. During the 1980s, under Chief Larry McMillen (1980-2002), a first responder program was initiated and all firefighters became certified Emergency Medical Technicians (EMTs). A new hazardous material team was established with extensively trained squad members. Their unit is recognized as among the nation's best in dealing with "hazmat" incidents.

Modern technology and equipment remains the rule of the day. Updated nozzles, air packs, tools and four-inch supply lines have been employed. As the first responder program began to unfold, a new system was designed to handle the overload of calls on the present dispatch operation.

Today, the Fort Worth Fire Department is a diverse organization comprised of 745 full time professional firefighters. The FWFD serves the citizens of the city by providing the best level of protection available from ravages of fire. Each year the department responds to over 57,000 incidents, 60 percent of which are emergency medical calls.

Public Safety Trunk Systems in Cowtown

Several years ago Tarrant County and Fort Worth combined resources and constructed two trunk radio systems for their use. The largest of the two systems is the Tarrant County/Fort Worth Public Safety Trunk System (see table one). This trunk system is a Motorola Analog Type II (System ID 3532) Smartnet system with five simulcast sites scattered around the county. It can be trunk tracked with any of the scanners in the marketplace today.

In addition to the Fort Worth police/fire departments and the Tarrant County sheriff office, this system also supports several other county municipalities and agencies, including MedStar EMS and area hospitals; City of Arlington trunk system police and fire backup; Forrest Hill police/fire/public works; fire and police departments from Haltom, Kennedale, North Richland Hills, and Richland Hills; City/County correctional facilities; Texas Christian University and University of North Texas talkgroups; and various interoperability capability.

To aid listeners in receiving and understanding communications on the system, you can get the police signals and codes on the FWPD website at: **www.fortworthpd.com/radiosignals.htm** and you can download Fort Worth Patrol Division Maps at **www.fortworthpd.com/maps.htm**

The city/county services trunk radio system is the second and smaller system used by Tarrant County and the City of Fort Worth. It is a Motorola Analog Type II (Motorola System ID 4309) and has only one transmitter site. That site is on the top of the Burnett Plaza Building at 800 Cherry Street in downtown Fort Worth.

Like its public safety cousin above, there are a wide variety of users of this system. Here you will find the communications of various city/county services such as waste disposal,

streets/lights/signs, sewer and water, and other important government functions. The primary users of this system are the various divisions of the Transportation Public Works Department.

This system does provide backup capabilities for the Fort Worth/Tarrant County Public Safety System. Thus the talkgroups of both systems can and will be seen at times on either system.

In Conclusion

There are a lot more public safety communication systems in the DFW Metroplex. Unfortunately, we can't cover them all in this article. You can learn more about them at the websites mentioned below.

We would like to thank the good folks at RadioReference.com, and to Mr. Ben Saladino, KC5IRJ (Scanning Dallas/Fort Worth Area website at **www.bensware.com/scandfw)** for their assistance in preparing this article. You can keep up with the latest changes in frequencies and talkgroups in the DFW Metroplex area at these two fine websites. We would also like to thank Mr. Paul Opitz and the entire gang at Uniden American in Fort Worth for their help and support during our visit to Cowtown.

From the wild cowboy days, Fort Worth police and fire have established itself as one of the finest in the nation. Each is a professional who has taken an oath to be willing to lay down his or her life for his fellow citizen. I think the early settlers would be very proud of what became of Cowtown.

This proud native certainly is.

Table 1 – Fort Worth / Tarrant County Public Safety System

Frequencies: 866.1625 866.2125 866.2875 866.3625 866.3875 866.6625 866.6875 866.7125 866.8375 866.8875 867.1625 867.2125 867.2625 867.3375 867.3875 867.6625 867.7125 867.7625 867.8375 867.8875

Fort Worth Police Department Talkgroups

North Talkgroups

2992 North Div - Patrol Dispatch
3024 North Div - CID
3056 North Div - CRO/Code Blue 1
3088 North Div - Supervisor
3120 North Div - Foot/Bike Patrol
3152 North Div - Talk <Channel 1>
3184 North Div - Talk <Channel 2>
3216 North Div - Talk <Channel 3>
6864 North Div - CRO/Code Blue 2
18832 North Div - CRO/Code Blue 3
18864 North Div - CRO/Code Blue 4

South Talkgroups

2448 South Div - Patrol Dispatch
2480 South Div - CID
2512 South Div - CRO/Code Blue 1
2544 South Div - Supervisor
2576 South Div - Directed Patrol
2608 South Div - Talk <Channel 1>
2640 South Div - Talk <Channel 2>
2672 South Div - Talk <Channel 3>
2960 South Div - K9
6896 South Div - CRO/Code Blue 2
18896 South Div - CRO/Code Blue 3
18928 South Div - CRO/Code Blue 4

East Talkgroups

2160 East Div - Patrol Dispatch
2192 East Div - CID
2224 East Div - CRO/Code Blue 1
2256 East Div - Supervisor
2288 East Div - TRAC
2320 East Div - Talk <Channel 1>
2352 East Div - Talk <Channel 2>
2384 East Div - Talk <Channel 3>
6800 East Div - CRO/Code Blue 2
18960 East Div - CRO/Code Blue 3
18992 East Div - CRO/Code Blue 4

West Talkgroups

2704 West Div - Patrol Dispatch
2736 West Div - CID
2768 West Div - CRO/Code Blue 1
2800 West Div - Supervisor
2832 West Div - Directed Patrol
2864 West Div - Talk <Channel 1>
2896 West Div - Talk <Channel 2>
2928 West Div - Talk <Channel 3>
6832 West Div - CRO/Code Blue 2
19024 West Div - CRO/Code Blue 3
19056 West Div - CRO/Code Blue 4

Central Talkgroups

3248 Central Div - Patrol Dispatch
3280 Central Div - CID
3312 Central Div - CRO/Code Blue 1
3344 Central Div - Supervisor
3376 Central Div - Directed Patrol
3408 Central Div - Talk <Channel 1>
3440 Central Div - Talk <Channel 2> TMS OPS
3472 Central Div - Talk <Channel 3>
6928 Central Div - CRO/Code Blue 2
19088 Central Div - CRO/Code Blue 3
19120 Central Div - CRO/Code Blue 4

Miscellaneous Police Talkgroups

976 Marshals Municipal Court <Channel 1>
2416 Public Information Channel
3504 Air Support Div
3536 Traffic Div
3568 Major Crimes Div
3600 Auto Theft Div
3632 Violent Crimes Div
3664 SWAT Team
3696 Special Enforcement
3728 Narcotics Div
3760 Youth Div
3792 School Liaison
3824 DARE Unit
3856 Crime Scene Search Unit
3888 SOD Administration
3920 Traffic Investigations
3952 Traffic Special Detail
3984 Major Crimes Surveillance
4016 Auto Theft Surveillance
4048 Violent Crimes Surveillance
4080 Police Announcement Group
4112 Special Enforcement Surveillance
4144 Narcotics Surveillance
4176 Vice Surveillance
4208 SSB Surveillance
4240 CID Surveillance
4272 SOD Surveillance
4304 SOD Tactical 1
4336 SOD Tactical 2
4368 SWAT Hostage Negotiation
4400 Air Support Talk <Channel 1>
4432 Air Support Talk <Channel 2>
4464 Traffic Talk <Channel 1>
4496 Traffic Talk <Channel 2>
4528 Traffic Supervisor
4560 Traffic Reserve Units
4592 CID Talk <Channel 1>
4624 Crime Analysis Talk <Channel 1>
4656 Vice Talk <Channel 1>
4688 Youth Talk <Channel 1>
4720 Internal Affairs Div
4752 Internal Affairs Div Surveillance
5008 Police Communications Training 1
5040 Police Communications Training 2
5072 Police Communications Training 3
5104 Police Academy Training 1
5136 Police Academy Training 2
5168 Police Academy Training 3
5488 SSB Administrative
5520 Police Staff
5712 SOD Surveillance Ops Tactical 3
6512 Police Emergency Help
6768 Unknown user/Surveillance Ops
6960 Vice Common
7312 SWAT Surveillance
18800 Marshals <Channel 2>

Fort Worth Fire Department Talkgroups

1808 Fire Dispatch <Channel 1>
1840 Fire Structure Fires Working <Channel 2>
1872 Fire Minor Fires Working <Channel 3>
1904 Fire EMS Response <Channel 4>
1936 Fire Working <Channel 5>
1968 Fire Working (Airport & Secondary) <Channel 6>
2000 Fire Admin <Channel 12>
2032 Fire Investigation <Channel 15>
2064 Fire Prevention <Channel 14>
2096 Fire Command 8 <Channel 10>
2128 Fire Command 9 <Channel 11>
5200 Fire Academy 4
5232 Fire Academy 5
5264 Fire Special Events <Channel 13>
5296 Fire Academy 1
5328 Fire Academy 2
5360 Fire Academy 3
5392 Fire EMS Training <Channel 7>
5424 Fire Command <Channel 8>
5456 Fire Command <Channel 9>
6384 Fire Div 1 Talk
6416 Fire Div 2 Talk
6448 Fire Div 3 Talk
6480 Fire Div 4 Talk

Medstar EMS Talkgroups

7344 Medstar Dispatch <Channel 1>
7376 Medstar Dispatch <Channel 2>
7408 Medstar Primary MCI
7440 Medstar Secondary MCI
7472 Baylor All Saints Medical Center
7504 Medical Plaza Center of Fort Worth
7536 Harris Methodist Fort Worth Hospital
7568 St. Joseph Hospital
7600 John Peter Smith Hospital
7632 Osteopathic Medical Center of Texas
7664 Harris Methodist Southwest Hospital
7696 Baylor All Saints City View
7728 Huguley Memorial Medical Center
7760 Cook Children's Medical Center
7792 Hospital Common
7824 Medstar Area Metropolitan Authority AMA-1
7856 Medstar Area Metropolitan Authority AMA-2
7888 Medstar Area Metropolitan Authority AMA-3
7920 Medstar Area Metropolitan Authority AMA-4
7952 Medstar Support
7984 Medstar Control
8016 Medstar Supervisors
8048 Medstar Administrative
8080 Medstar Announcement Group

City of Arlington Talkgroups
(Backup talkgroups to their trunk system)

20336 Police North Back Up <Channel 1>
20368 Police West Back Up <Channel 2>
20400 Police East Back Up <Channel 3>
20432 Fire Back Up <Channel 1>
20464 Fire Back Up <Channel 2>
20496 Pire South Back Up <Channel 4>

City of Forest Hill Talkgroups

19248 Fire Announce Group
19280 Fire Dispatch <Channel 1>
19312 Fire <Channel 2>
19344 Fire <Channel 3>
19376 Fire <Channel 4>
19408 Fire <Channel 5>
19440 Fire <Channel 6>
19472 Fire <Channel 7>
19504 Fire <Channel 8>
19536 Fire <Channel 9>
19568 Fire <Channel 10>
19600 Fire <Channel 11>
19632 Fire <Channel 12>
19664 Fire <Channel 13>
19696 Fire <Channel 14>
19728 Fire <Channel 15>
19760 Fire <Channel 16>
21232 Police Patrol Dispatch <Channel 1>
21264 Police Patrol 1 <Channel 2>
21296 Police Patrol 2 <Channel 3>
21328 Police Admin <Channel 4>
21360 Police CID <Channel 5>
21392 Police Traffic <Channel 6>
21424 Police Tactical <Channel 7>
21456 Police Talk 1 <Channel 8>
21488 Police Talk 2 <Channel 9>
21520 Police Talk 3 <Channel 10>
21552 Police Talk 4 <Channel 11>
21584 Police Talk 5 <Channel 12>
21616 Police Talk 6 <Channel 13>
21648 Police Talk 7 <Channel 14>
21680 Police Talk 8 <Channel 15>
21712 Public Works

City of Haltom Talkgroups

13072 Police Patrol Dispatch 1 (Primary)
13104 Police Patrol Dispatch 2 (Secondary)
13136 Police Common Talk 1
13168 Police Common Talk 2
13200 Police Common Talk 3
13232 Police Common Talk 4
13264 Police Tactical Common 1
13296 Police Tactical Secure 2
13328 Police Tactical Secure 3
13360 Police Tactical Secure 4
13392 Police Hostage Negotiations
13424 Police Special Operations
13456 Police CID Investigations Common <Channel 1>
13488 Police CID Investigations Secure <Channel 2>
13520 Police CID Investigations Surveillance <Channel 3>
13552 Police Traffic 1
13584 Police Traffic 2
13616 Police Sergeants
13648 Police Administration
13680 Police Training 1
13712 Police Training 2
13744 Police/Fire Training 3
13776 Police/Fire Common 1
13808 Police/Fire Common 2
13840 Police/Fire Administration
13872 Police Announcement Group
13968 Fire 1 (Primary)
14000 Fire 2 (Secondary)
14032 Fire Administration
14064 Fire Talk 1
14096 Fire Talk 2
14128 Fire Training 1
14160 Fire Training 2
14192 Fire Inspections 1
14224 Fire Inspections 2
14256 Fire Investigations 1 (Primary)
14288 Fire Investigations 2 (Secondary)
14320 Fire Emergency Operations Center 1
14352 Fire Emergency Operations Center 2
14384 Fire Incident Command 1 (Primary)
14416 Fire Incident Command 2 (Secondary)
14448 Fire Announcement Group

City of Kennadale Talkgroups

12304 Police Patrol Dispatch
12336 Police Patrol Car to Car
12368 Police Traffic Enforcement
12400 Citywide Emergency Ops
12432 Police Tactical
12464 Police CID Investigation
12496 Police CID Surveillance
12528 Police Special Enforcement
12560 Police Crime Scene
12592 Police Supervisors
12624 Police Administration
12656 Police Special Investigations
12688 City Administration
12720 Police Tactical (Ground)
12752 Kennedale Announcement Group
12784 Fire Dispatch <Channel 1>
12816 Fire Dispatch <Channel 2>
12848 Fire Ground Talk 1
12880 Fire Ground Talk 2
12912 Fire Incident Command
12944 Fire Support
12976 Fire Training
13008 Fire Administration
13040 EMS Talk 1

City of North Richland Hills Talkgroups

10768 Police Patrol Dispatch
10800 Police CID Dispatch/NCIC
10832 Police Talk 1
10864 Police Talk 2
10896 Police Talk 3
10928 Police Talk 4/Jail
10960 Police Tactical Primary
10992 Police Tactical Perimeter
11024 Police Tactical Talk 1
11056 Police Tactical Talk 2
11088 Police Hostage Negotiation
11120 Police Special Enforcement
11152 Police Traffic/Special Operations
11184 Police Traffic Talk 1
11216 Police Traffic Talk 2
11248 Police CID Talk 1
11280 Police CID Talk 2
11312 Police CID Surveillance
11344 Police SID Talk 1
11376 Police SID Talk 2
11408 Police SID Surveillance
11440 Police Sergeants
11472 Police Command
11504 Police Admin
11536 Police Training Talk 1
11568 Police Training Talk 2
11600 Police Announcement Group

11632 Police/Fire Common 1
11664 Police/Fire Common 2
11696 Fire Dispatch/Response 1
11728 Fire Dispatch/Response 2
11760 Fire Incident Command 3
11792 Fire Talk 1
11824 Fire Talk 2
11856 Fire Talk 3
11888 Fire Admin 1/Emergency Operations
11920 Fire Admin 2
11952 Fire Arson Investigation 1
11984 Fire Arson Investigation Talk 2
12016 Fire Hazmat Group 1
12048 Fire Hazmat Group 2 Talk
12080 Fire EOD 1
12112 Fire EOD 2 Talk
12144 Fire Training 1
12176 Fire Training 2

City of Richland Hills Talkgroups

14768 Police Admin
14800 Police Sergeants
14832 Police Tactical 1
14864 Police Tactical 2
14896 Police CID
14928 Police Patrol Dispatch 1
14960 Police Talk 2
14992 City 1
15024 City 2
15056 Police Special Operations
15088 Police Training
15120 City 3
15152 Fire Dispatch 1
15184 Fire Talk 2
15216 Fire Fireground 1
15248 Fire Fireground 2
15280 Fire Investigations
15312 Fire Admin
15344 Fire Training

Tarrant County Law Enforcement/Fire Talkgroups

8432 Sheriff Patrol Dispatch
8464 Sheriff Investigations
8496 Sheriff Warrant Operations Primary
8528 Sheriff Patrol Special Operations 1
8560 Sheriff Patrol Special Operations 2
8592 Sheriff Patrol Special Operations 3
8624 Sheriff Hostage
8656 Sheriff K-9 Units
8688 Sheriff Warrant Operations 1
8720 Sheriff Warrant Operations 2
8752 Sheriff Warrant Operations 3
8784 Sheriff Talk 1
8816 Sheriff Warrants Talk 1
8848 Sheriff Investigations Talk 1
8880 Sheriff Surveillance
8912 Sheriff Training 1
8944 Sheriff Training 2
8976 Sheriff Tac-1
9008 Sheriff Narcotics Operations
9040 Sheriff Staff
9072 Sheriff Admin
9104 County Constables 1
9136 County Constables 2
9168 County District Attorney
9200 County Medical Examiner
9232 County Constable Precinct 1
9264 County Constable Precinct 2
9296 County Constable Precinct 3
9328 County Constable Precinct 4
9360 County Constable Precinct 5
9392 County Constable Precinct 6
9424 County Constable Precinct 7
9456 County Constable Precinct 8
9488 County Constable Cars
9520 Sheriff Prisoner Transport
9552 Sheriff Security Force
9584 Sheriff Narcotics Int Coordination Unit
9616 Sheriff Jail Operations
9648 Sheriff Patrol Staff
9680 Sheriff Warrants Staff
9712 Emergency Operations Center
9744 County District Attorney 2
9776 County District Attorney 3
9808 County District Attorney 4
9840 County Fire Marshal
9872 Sheriff Training Div Staff
9904 County On-call Crime Warrants
9936 County On-call Civil Warrants
9968 County On-call Mental Warrants
10064 Sheriff Crime Warrants Duty Officer 1
10096 County Courtroom Security Regular GP-1
10128 County Courtroom Security Major Case 1
10160 County Courtroom Security Major Case 2
10192 County Courtroom Security Regular GP-2
10224 County Civil Warrants Talk
10256 Sheriff Internal Affairs Division
10288 Sheriff Internal Affairs Car-Car
10320 County Public Information Group
10352 County Medical Examiner Car-Car
10384 Sheriff Auto Task Force
10416 Sheriff Narcotics Int Coordination Unit Operations 3
10448 Sheriff Narcotics Int Coordination Unit Talk 1
10480 Sheriff Narcotics Int Coordination Unit Talk 2
10544 Sheriff Narcotics Int Coordination Unit East
10576 Sheriff Narcotics Int Coordination Unit West
10608 Sheriff Narcotics Int Coordination Unit Operations 1
10640 Sheriff Narcotics Int Coordination Unit Operations 2
10672 County Public Health Department
12208 County Fire Marshal Talk 1
16176 County Corrections Unknown user/usage
16208 County Corrections Unknown user Talk
16816 County Corrections Center (100 North Lamar)
16880 County Corrections Service/Unknown usage
16912 County Corrections Admin
17008 County Corrections Med/EMT
17040 County Corrections Fire Team
17072 County Corrections Belknap Facility (350 West Belknap)/Unknown usage
17104 County Corrections Cold Springs Facility (1815 Cold Springs Road)/Unknown usage
17136 County Corrections Green Bay Facility (5136 Northeast Parkway)/Unknown usage
18096 County Corrections Belknap Facility/Unknown usage
18512 County Corrections Green Bay Facility Talk
18544 County Corrections Green Bay Facility Old Building/Unknown usage
18576 County Corrections Green Bay Facility Old Building Talk
18608 County Corrections Green Bay Facility New Building/Unknown usage
18640 County Corrections Green Bay Facility New Building Talk
18672 County Corrections Green Bay Facility Medical
18704 County Corrections Green Bay Facility Service
18736 County Jail Staff 1

Texas Christian University Talkgroups

20592 Police <TCU-1>
20624 Police <TCU-2>
20656 Unknown usage <TCU-3>
20688 Unknown usage <TCU-4>
20720 Unknown usage <TCU-5>
20752 Unknown usage <TCU-6>
20784 Unknown usage <TCU-CID-1>
20816 Unknown usage <TCU-CID-2>
20848 Unknown usage <TCU-SIE-1>
20880 Unknown usage <TCU-SIE-2>
20912 Unknown usage <TCU-S-1>
20944 Unknown usage <TCU-S-2>
20976 Unknown usage <TCU-S-3>
21008 TCU Announcement Group

University of North Texas Health Science Center

8240 Police Patrol Dispatch
8272 Police Talk 1
8304 Police Backup
8336 Police Talk 2

Fort Worth Convention Center Talkgroups

14480 Convention Center <Channel 1>
14512 Convention Center <Channel 2>
14544 Convention Center Operations
14576 Convention Center Power House
14608 Convention Center Arena Operations
14640 Convention Center Exhibit Hall
14672 Convention Center Theater
14704 Convention Center Parking
14736 Convention Center/Unknown usage

Fort Worth/Tarrant County Miscellaneous Talkgroups

4784 Fort Worth Fiscal EQ/Staff Services
4816 Fort Worth Deputy Chiefs/City Staff
4848 Fort Worth Internal Audit Department Team
4880 Fort Worth ESB - Admin <Channel 1>
4912 Fort Worth ESB - Admin <Channel 2>
4944 Fort Worth Police/Fire Staff
4976 Fort Worth Police/City Staff
5552 Fort Worth City Wide - Admin 1
5584 Fort Worth City Wide - Admin 2
5616 Fort Worth City Wide - Public Safety 1
5648 Fort Worth City Wide - Public Safety 2
6160 County Wide 1
6192 County Wide 2
6256 County Health-Animal Control
6352 Emergency Operations <EMO 15>
7248 Northeast Tarrant County Mutual-Aid
12240 Emergency Operations Center EOC 1 <EOC 13>
12272 Emergency Operations Center EOC 2 <EOC 14>
13904 Northeast Tarrant County Coordination 1
13936 Northeast Tarrant County Coordination 2
18768 Fort Worth-Arlington Public Safety Interconnection 1
19152 Texas Wesleyan College Security
19184 Fort Worth-Arlington Public Safety Interconnection 2
19792 Fort Worth-Arlington Fire Mutual Aid 1
19824 Fort Worth-Arlington Fire Mutual Aid 2
19856 Texas Alcohol Beverage Commission TABC 1
19888 Texas Alcohol Beverage Commission TABC 2
19920 Fort Worth City Manager 1
19952 Fort Worth City Manager 2
19984 Fort Worth City Manager 3
20272 Fort Worth-Mansfield Jail Coordination
21072 Fort Worth Public Safety Interoperability Testing Test 1
21136 Fort Worth Public Safety Interconnect with Other Systems Test 2
21168 Federal Emergency Management Agency FEMA 1
21200 Federal Emergency Management Agency FEMA 2

Misc Talkgroups to be Identified

15504 School Operations
20240 Unknown user/usage
20304 BNSF Police Talk 1
21040 Unknown user/usage

Radio Shop Talkgroups

5680 City Services Announcement Group
5936 Motorola Announcement Group 1
5968 Motorola Announcement Group 2
6000 Electronic Maintenance
6032 Motorola Talkgroup 1
6064 Motorola Talkgroup 2
6096 Motorola Talkgroup 3
6128 Motorola Talkgroup 4

Table 2 – Fort Worth / Tarrant City/County Services System

Frequencies: 866.1875 866.2375 866.2625 866.3125 866.3375 866.7375 866.7625 866.7875 866.8125 866.8625 867.1875 867.2375 867.2875 867.3125 867.3625 867.6875 867.7375 867.7875 867.8125 867.8625

System Talkgroups

16 Code Enforcement Common 1
48 Code Enforcement Supervisors 2
80 Will Rogers Memorial Center
112 Airport/Unknown usage
144 Department of Development Common
176 Department of Development Supervisors
208 Department of Development Building Inspectors
240 Department of Development Plumbing Inspectors
272 Department of Development Mechanical Inspectors
304 Department of Development Sign Inspectors
336 Department of Development Electrical Inspectors
368 Waste Collection 1
400 Waste Collection 2 Brush and Bulky Waste
432 City Services Common
464 Equipment Services Common
496 Equipment Services Management
528 Equipment Services Material
560 Transportation Public Works Division Heads
592 Transportation Public Works Common
624 Streets Maintenance and Administration
656 Streets General Maintenance
688 Streets Supervisors
720 Construction Inspection
752 Traffic Engineering Supervisors
784 Signs/Markings General Services
816 Building Maintenance
848 General Services Supervisors
880 Light/Signal Division <Channel 1>
912 Light/Signal Division <Channel 2>
944 Light/Signal Division Supervisors
1008 Health Department
1040 Water Division Dispatch <Channel 1>
1072 Water Division Dispatch <Channel 2>
1104 Water Division Dispatch <Channel 3>
1136 Water Division Dispatch <Channel 4>
1168 Water Division Dispatch <Channel 5>
1200 Water Division Admin Supervisors
1232 Water Division Streets Cut
1264 Water Division Water Service
1296 Water Division Water Mains
1328 Water Division Valve Fire Hydrants
1360 Water Division New Construction
1392 Water Division Research and Investigation
1424 Water Division Customer Service
1456 Water Division Sewer Repair
1472 Water Division Sewer Talk
1488 Water Division Sewer Clean
1520 Water Division Sewer Stoppages
1552 Water Division Engineering
1584 Water Division Production
1616 Village Creek Water Treatment
1648 Water Division Administration
1680 Parks and Community Services Administration
1712 Parks and Community Services Recreation
1744 Parks and Community Services Facilities/Planning
1776 Parks and Community Services Supervisors
5744 Department of Development Announcement Group
5776 Parks and Community Services Announcement Group
5808 Equipment Services Announcement Group
5840 Water Division Announcement Group
5872 Transportation Public Works Announcement Group
5904 Lights/Streets Announcement Group
6224 Streets Emergency Operations
6256 Tarrant County Health-Animal Control
6288 Department Environmental Control
6320 Health Department Announcement Group
6992 Telephone Maintenance
7024 Outside Maintenance
7056 Electronic Administration
7088 Electronic Announcement Group
8400 Survey 1
10000 County Mental Health Ops GP-1
10032 County Mental Health Ops GP-2
10512 Survey Crews
15408 Sycamore Golf Course
15440 Meadowbrook Golf Course
15568 Survey 2
15600 Survey 3
15632 Survey 4
15664 Survey 5
15696 Survey 6
15728 Survey 7
15760 Survey 8
20016 Transportation Authority Bus Operations
20048 Transportation Authority Paratransit
20080 Transportation Authority Supervisors
20112 Transportation Authority MITS Supervisors
20176 Transportation Authority Bus Ops (Back-up)
20208 Transportation Authority Spare

Scanning the Holy City

A Guide to Monitoring in Charleston, SC

By Mark Cleary

Over 335 years ago, on the first Wednesday of April 1670, 148 colonists established the first permanent European settlement in the Carolina province on the banks of the Ashley River at Albermarle Point. That settlement was called Charles Towne in honor of King Charles II of England. A decade later the settlement was moved across the river to its present site on the peninsula where the Cooper, Ashley, and Wando Rivers come together to form Charleston Harbor.

In the centuries following its founding, Charleston has faced epidemics, pirates, wars, fires, earthquakes, and hurricanes, but that seed those settlers planted so long ago continues to grow and prosper.

Charleston Today

Charleston is known as "The Holy City" because of the many church steeples that dot its skyline as well as its history of religious diversity dating back to colonial times. Charleston County is now home to more than 310,000 people. The county consists of 919 square miles and boasts 100 miles of coastline adjoining the Atlantic Ocean. The city is a commercial gateway for the rest of the state. The port of Charleston is the fourth busiest in the nation.

Tourism is South Carolina's biggest industry and almost 5 million tourists visit Charleston annually. The sunshine, mild winters, and abundant recreational opportunities also bring in thousands of new permanent residents each year.

Charleston offers something for everyone. Many come for the cultural events, shopping, or fine dining. Others come for the museums, plantations, and historical sites. Still others come for the area beaches, golf courses, harbors, and waterways. Charleston also has plenty of action to offer the radio hobbyist.

City of Charleston Trunked Radio System

The city of Charleston operates its own 800 MHz Motorola Type II Smartnet trunked radio system (TRS). This TRS provides communications for the city police and fire departments as well as the other city services. The police and fire departments have separate dispatch facilities. The frequent breakdowns and coverage problems this system has experienced, plus the ongoing 800 MHz band reallocation, means a new digital system is probably inevitable sometime in the future.

Charleston Fire Department

The City of Charleston Fire Department is an International Organization for Standardization (ISO) Class 1 rated department on a scale of 1 to 10. This means they are the best of the best! The department consists of 19 fire companies located throughout the city protecting the city's 96,000 residents.

Charleston Police Department

The police department employs over 360 police officers and 130 civilians. The Charleston Police Department was the first municipal law enforcement agency in the state to be accredited. The department has many specialized units including the SWAT team, bomb squad, mounted horse patrol, aviation unit, and harbor patrol.

The department's patrol areas are divided into teams.

Team	Patrol Area
Team 1	Northern Peninsula
Team 2	Southern Peninsula
Team 3	James and Johns Islands
Team 4	West Ashley
Team 5	Traffic/Parking Enforcement
Team 6	Special Ops
Team 7	Foot Patrol
Team 8	Detectives
Team 9	Housing Authority
Team 10	Daniel Island

City of Charleston TRS

Frequencies

1 - 854.96250
2 - 855.48750
3 - 855.96250*
4 - 858.96250*
5 - 859.76250*
6 - 860.76250*
7 - 866.03750
8 - 866.35000
9 - 866.65000
10 - 867.03750
11 - 867.35000
12 - 867.65000
13 - 867.90000
14 - 868.26250
15 - 868.53750
16 -868.98750

* *indicates control channels*

Talkgroup	Description
33264	Fire Dispatch
33280	Fire Chl 2
33296	Fire Chl 3
32848	Animal Control
32864	Police Peninsula
32768	Police West Ashley
32784	Police Chl 2
32800	Mutual Aid
32816	Command
32880	Meeting A
32896	Meeting B
32976	Meeting C
33040	Meeting D
33472	Meeting E
32912	Safety Services
32928	Parking Enforcement
33120	Traffic and Transportation
33200	Traffic
33328	Event A
33344	Event B
33360	Event C
32944	Event D
33408	Bomb A
33424	Bomb B
33440	Harbor Patrol
33584	CTAC 1
33600	CTAC 2
33616	CTAC 3
33632	CTAC 4
33648	CTAC 5
33664	CTAC 6/Parking Enforcement
33680	CTAC 7
33696	CTAC 8
33712	CTAC 9
33728	CTAC 10
33992	Narcotics A
33008	Narcotics B
33024	Narcotics C

Charleston County TRS

The Charleston County Radio Communications Department operates an 800 MHz Motorola Type II Smartnet TRS. This system utilizes six towers and provides communications for the various county agencies as well as the city of North Charleston, the town of Mount Pleasant, local colleges, and the various barrier island and rural communities.

Frequencies

856.23750
856.48750
856.73750
856.93750
857.23750
857.48750
857.73750
857.93750
858.23750
858.48750
858.73750
858.93750
859.23750*
859.48750
859.73750
859.93750

860.23750*
860.48750
860.73750
860.93750

Charleston County Sheriff's Office

The Charleston County Sheriff's Office (CCSO) is the oldest in South Carolina. CCSO provides law enforcement protection for unincorporated and outlying areas of the county as well as running the county jail and providing security for the court system. CCSO has several specialized units including the SWAT team, an aviation unit, a marine patrol, and animal control. The Charleston County detention center averages more than 1,300 inmates daily.

CCSO patrol districts are divided into two areas: The South/West Patrol District and the North/East Patrol District. The West Patrol District patrols the unincorporated sections of West Ashley, James Island, Johns Island, Wadmalaw Island, Seabrook Island, and Kiawah Island. Deputies assigned to the South Patrol District patrol Ravenel, Hollywood, Yonges Island, Meggett, Adams Run, Parkers Ferry, and Edisto Island. The deputies assigned to the North Patrol District provide services to the unincorporated areas of North Charleston, Ladson, and Lincolnville. Deputies from the East District Office patrol Mount Pleasant, Awendaw, South Santee, and McClellanville.

CCSO Talkgroups

Talkgroup	Description
912	CCSO Command
944	CCSO West/South
976	CCSO North/East
1008	CCSO Weed & Seed
1040	CCSO Investigators
1072	CCSO Traffic
1104	CCSO Records
1168	CCSO Special Ops 1
1200	CCSO Special Ops 2
1232	CCSO Metro
1296	CCSO Meeting 3
1328	CCSO Meeting 4
1392	CCSO Boats
1584	CCSO Warrants
1776	CCSO Metro 2
3024	CCSO Dive Team
3408	CCSO North Talk
3440	CCSO South Talk
3472	CCSO East Talk
3504	CCSO West Talk
1616	Jail Ops
1648	Jail Admin
1680	Jail Transport
1712	Jail Meeting
4816	SC TAC 1
4848	SC TAC 2
4880	SC TAC 3
4912	SC TAC 4
4944	SC TAC 5
4976	SC TAC 6
5008	SC TAC 7
5040	SC TAC 8
5072	SC TAC 9
5104	SC TAC 10

Charleston County Rescue and EMS

Founded in 1973, the Charleston County Emergency Medical Service Department provides emergency medical services countywide utilizing a fleet of ambulances and quick response vehicles. EMS responds to nearly 50,000 calls per year. EMS dispatchers located at the Lonnie Hamilton Public Service Building on Bridge View Drive in North Charleston also dispatch calls for several outlying fire departments and the Charleston County Volunteer Fire and Rescue Squad.

Charleston County EMS Talkgroups

Talkgroup	Description
1904	EMS Command
1936	EMS Dispatch
2000	Charleston County Rescue Squad
2032	EMS Special Ops 3/EMS Common
2064	EMS Meeting 1
2096	EMS Meeting 2/EMS Common
2128	EMS to Medical University Hospital
2160	EMS to Charleston Memorial Hospital
2192	EMS to Roper Hospital
2224	EMS to St. Francis Hospital
2320	EMS to Trident Hospital
2352	EMS to East Cooper Hospital
2416	EMS to Hospital Meeting
2448	EMS Admin
2512	Rescue Squad Talk
2576	EMS Special Ops 4
9008	EMS Call
11728	EMS to Roper Northwoods
11856	EMS Ops 2
1968	Awendaw FD
2544	Awendaw FD Meeting
5520	St. Pauls FD
9168	St. Pauls FD Fireground 1
9200	St. Pauls FD Fireground 2
12816	Lincolnville FD

EMS also continues to use their legacy conventional VHF frequencies.

Frequency	Tone	Description
155.1750	127.3	EMS-1
155.3400	127.3	EMS-2
155.3850	127.3	EMS-3 Backup Channel
155.2200	127.3	EMS-4 County Rescue Dispatch
154.3700	127.3	EMS-5 County Rescue Talk

City of North Charleston

Incorporated in June 1972, North Charleston has grown into a city of 85,000 encompassing 60 square miles and has become South Carolina's third largest municipality. North Charleston attracts millions of visitors each year with its shopping malls, convention center, and 13,000 seat coliseum.

North Charleston operates on the Charleston County TRS.

North Charleston Police Department

The North Charleston Police Department (NCPD) employs over 270 officers and 95 civilian employees who serve a population that swells to over 200,000 during business hours. The City of North Charleston is divided into twelve patrol zones divided between three precincts. The North Precinct is covered out of police headquarters located at city hall on Lacross Road. The South Precinct is located at Cosgrove and Rivers Avenue and the West Precinct is located at Ashley Phosphate and Dorchester Roads. City dispatchers dispatch both police and fire calls from police headquarters.

North Charleston Fire Department

The North Charleston Fire Department (NCFD) provides ISO Class 2 fire protection from 11 stations divided between the North and South Battalions. NCFD operates 11 engine companies, 3 ladder companies, and several specialized rescue squad companies. NCFD assists EMS through their first responder program.

North Charleston Talkgroups

Talkgroup	Description
8528	NCPD North
8560	NCPD South
8592	NCPD Warrants
8624	NCPD Detectives
8656	NCPD Crime Scene
8688	NCPD Records
8720	NCPD Admin
8752	NCPD Traffic
8784	NCPD Narcotics
8816	NCPD Meeting A
8848	NCPD Meeting B
8912	NCPD Speed Team
7216	NCFD Ops
7248	NCFD Fireground 1
7280	NCFD Fireground 2
7312	NCFD Fireground 3
7440	NCFD Admin 1
8944	Coliseum Command
10256	Coliseum Security
10288	Coliseum Services
10320	Coliseum Parking
13072	Coliseum Security

Town of Mount Pleasant

Once a sleepy bedroom community across the river from Charleston, Mount Pleasant is now a bustling community of over 66,000. This coastal town is one of the fastest growing communities not only in the state, but also the nation. North America's longest cable-stayed bridge, the Arthur Ravenel Jr. Bridge, connects Mount Pleasant and Charleston.

Mount Pleasant operates on the Charleston County TRS. Police and fire dispatching is done from the Town's Municipal Complex.

Mount Pleasant Police Department

The Mount Pleasant Police Department (MPPD) is a nationally accredited agency. MPPD employs over 130 officers and 40 civilians. The town's 55 square miles are divided into six patrol districts.

Mount Pleasant Fire Department

The Mount Pleasant Fire Department (MPFD) has been providing fire protection since 1837. The fire department is comprised of over 100 paid personnel and several volunteers. MPFD currently holds an ISO Class 2 rating. In 2001, Mount Pleasant became one of 21 cities in the United States to have both fire and police departments accredited. MPFD operates five fire stations with 5 engines, 3 ladder trucks, and a rescue squad as well as rescue boats.

Mount Pleasant Talkgroups

Talkgroup	Description
7920	MPPD Ops
7856	MPPD Chl 3
7888	MPPD Training
7952	MPPD Admin
7984	MPPD Command
8016	MPPD Narcotics
8112	MPPD Tac
7664	MPFD Dispatch/Ops
7696	MPFD Command
7728	MPFD Fireground 1
7760	MPFD Fireground 2
7792	MPFD Training

Area Colleges

Area colleges can also be found on the Charleston County TRS. South Carolina's military college, The Citadel, and the College of Charleston are both located in downtown Charleston. Both colleges have their own public safety departments staffed with certified police officers.

College Talkgroups

Talkgroup	Description
4528	Citadel Building Services
4560	Citadel Building Services
4592	Citadel Building Services
4624	Citadel Building Services
4656	Citadel Public Safety Chl 1
4688	Citadel Public Safety Chl 2
4720	Citadel
4752	Citadel Special Events
4784	Citadel
6672	College of Charleston
7088	College of Charleston
7120	College of Charleston
7184	College of Charleston Building Services
10704	College of Charleston
12208	Citadel

The College of Charleston Public Safety uses two 800 MHz conventional frequencies.

Frequency	Tone	Description
857.9875	103.5	College of Charleston Public Safety Chl 1
858.9875	103.5	College of Charleston Public Safety Chl 2

Other Users

The resort communities of Isle of Palms, Sullivans Island, Kiawah, and Seabrook use the Charleston County TRS for their town communications. Other municipalities on the system include James Island, St. Johns, Folly Beach, and St. Andrews.

The Charleston County Emergency Preparedness Division (EPD) has talkgroups on the system that become active whenever a hurricane is near!

The City of Charleston has talkgroups on the county's system for use when their own TRS fails.

Talkgoup	Description
624	EPD Ops
656	EPD
880	EPD
2768	Seabrook Island
2800	Seabrook Island
2864	Folly Beach Public Safety
2960	Folly Beach Talk
5488	Kiawah Island
6480	James Island FD 1
6512	James Island FD Fireground
6544	James Island FD 2
6000	Sullivans Island FD Ops
6032	Sullivans Island FD Fireground
5712	Isle of Palms FD Dispatch
6224	Isle of Palms PD
9584	Isle of Palms PD/Sullivans Island PD Ops
9616	Sullivans Island PD 2
9712	Isle of Palms PD 2
9424	Charleston PD
10512	Charleston FD
9840	St. Andrews FD
10576	St. Andrews FD Fireground 1
9680	St. Johns FD
12624	St. Johns FD Fireground
7600	Event 1
8880	Event 2
8048	Event 3
9232	Event 4
9296	Event 5

Palmetto 800 TRS

The Palmetto 800 TRS is a statewide 800 MHz Motorola Type II SmartZone system. It is owned by Motorola and users pay a monthly fee to use it. The TRS provides reliable and interoperable communications to state, local, and federal agencies in every county in the state. The Palmetto 800 TRS was covered in depth in the July 2005 issue of *Monitoring Times*.

In Charleston, numerous agencies including the South Carolina Highway Patrol (SCHP) Troop 6, the Department of Public Safety (DPS), the Department of Health and Environmental Conservation (DHEC), and the Medical University of South Carolina (MUSC) use the system. The Palmetto 800 system is also heavily used during hurricane evacuations.

The Hagood cell of the TRS provides coverage of much of the county.

Palmetto 800 TRS Hagood Cell Frequencies

854.98750
855.13750
856.33750
856.83750
857.33750
857.83750
857.96250
858.33750
858.71250
858.83750*
859.83750*
859.96250
860.26250
860.28750
860.96250
866.40000
867.26250
868.76250

Charleston Area Palmetto 800 TRS Talkgroups

Talkgroup	Description
3920	CareForce Medical Helicopter
6960	LE Common
3856	SCHP Chl 145 Air to Ground
7600	SCHP Chl 74 LE Common 5/Hurricane Evacuations
29712	SCHP Chl 81 Charleston/Berkeley
29616	SCHP Chl 82 Talk
29968	SCHP Chl 83 Dorchester/Colleton
30096	SCHP Chl 84 Beaufort/Jasper
21648	SCHP Chl 88 DPS 6
31248	SCHP Chl 89 Special Ops 6
20816	SCHP Chl 90 LE Common 6/Hurricane Evac
30832	SC EMD Common
32304	SC EMD Ops 1/Hurricane Evacuation
30896	SC EMD Ops
30128	DPS Chl 146/DOT Hurricane Evacuations
32144	SC Dept. of Corrections
34544	SC Probation, Pardon and Parole Roam/Hurricane Evac
45520	SC DHEC Lowcountry Hospital Net
3824	MUSC Ambulance/Helicopter Dispatch
44016	MUSC Ops
44048	MUSC Ops 2
44208	MUSC
44240	MUSC Security
44358	MUSC Maintenance
50928	MUSC Meducare/LifeCare Helicopter Flight Control

The Port of Charleston

The South Carolina State Ports Authority (SPA) owns and operates the Port of Charleston consisting of the Columbus Street Terminal, the Wando Welch Terminal, Union Pier, the North Charleston Terminal, and the Veterans Terminal on the old navy base. Charleston is one of the busiest ports in the nation. On an average day, six vessels sail into our state's harbors, carrying 32,000 tons of cargo worth more than $75 million.

The Port Authority operates on the Charleston County TRS and also has it's own EDACS TRS. All traffic of interest to the hobbyist is on the County TRS.

Coast Guard

The United States Coast Guard has a large presence in Charleston. The Coast Guard base at the tip of the peninsula is headquarters of the recently created Sector Charleston. Their area of responsibility includes the entire coastline of South Carolina and Georgia. The Coast Guard's only two east coast based high endurance cutters, the USCGC *Dallas* (WHEC 716) and USCGC *Gallatin* (WHEC 721), are homeported at the old navy base in North Charleston. The cutters USCGC *Yellowfin* (WPB 87319), USCGC *Anvil* (WLIC 75301), and USCGC *Oak* (WLB 211) also call Charleston home. The Coast Guard keeps an HH-65 helicopter on alert at Air Facility Charleston at the Charleston Executive Airport on Johns Island. HH-65s rotate up daily from their air station in Savannah, GA.

Project SeaHawk

In a post-9/11 world, port security is of paramount importance and in Charleston that is the responsibility of Project SeaHawk. This pilot program is a joint federal, state, and local counter-terrorism joint task force responsible for overall security of the port, the harbor, the bridges, and the ships and their cargo. The task force is staffed by personnel from nearly every federal, state, and local law enforcement agency. Customs and Border Protection Officers screen

shipping containers. State Ports Authority Police patrol the docks. Coast Guard and local police vessels patrol the waterways escorting ships and guarding maritime protection zones. Several agencies provide intelligence support.

Most patrol boat radio traffic takes place either on the Marine VHF channels or the Harbor Patrol talkgroup on the Charleston County TRS. Nextel is used as well. Encrypted traffic has been monitored during special situations.

Charleston County TRS Port Talkgroups

Talkgroup	Description
784	State Ports Authority Ops
816	State Ports Authority Chl 2
848	State Ports Authority
2992	Harbor Patrol
4432	USCG Charleston
4848	SC TAC 2/Maritme Security Training
4880	SC TAC 3/Mar Security Training
4912	SC TAC 4/Mar Security Training
10544	USCG Charleston

Conventional Port Frequencies

Frequency/Repeater In	Description
156.0500	VHF Marine 1A Tugs
156.4500	VHF Marine 9 Hailing
156.6000	VHF Marine 12 Port Ops
156.6500	VHF Marine 13 Navigation Safety
156.7000	VHF Marine 14 Charleston Pilot
156.8000	VHF Marine 16 Hailing
157.0500	VHF Marine 21A USCG
157.1000	VHF Marine 22A USCG
157.1500	VHF Marine 23A USCG
157.0750	VHF Marine 81A USCG
157.1250	VHF Marine 82A USCG
157.1750	VHF Marine 83A USCG
159.8550	Charleston Navigation Company
165.2375/166.4375	DHS Net 1
166.4625	DHS Common
166.5875	DHS CBP
169.4500/171.0750	DHS Net 2
123.1000	USCG Air-Air
345.0000	USCG Air Ops Primary
237.9000	USCG Air Ops Secondary
326.1500	USCG Air-Ground Primary
379.0500	USCG Air-Ground Secondary

National Parks and Forests

The War Between the States started in Charleston Harbor with the firing on Fort Sumter. Today Fort Sumter is a national monument that can be visited by tour boat. Across the channel on Sullivans Island is the Fort Moultrie National Monument. This fort was the site of the first decisive American victory of the Revolutionary War when, on June 28, 1776, the British failed to take the fort after a nine hour battle. To commemorate this victory, every June 28th is a state holiday in South Carolina known as Carolina Day. Also located east of the Cooper River is the Charles Pinckney National Historical Site.These scattered sites use VHF radios to keep in touch.

To the north of Charleston is the 252,000 acre Francis Marion National Forest. Nearly every outdoor recreational activity you can think of can be found in its pine forests and remote swamps. Activities include hiking, camping, hunting, fishing, horseback riding, and canoeing.

Early spring is fire season in South Carolina, and there are several US Forest Service (USFS), SC Forestry, and SC Department of Natural Resources (DNR) VHF nets that become very active during this time of year.

Charleston Area NPS and Forestry Freqs

Frequency	Description
151.430	SC DNR Charleston
151.445	SC DNR Georgetown
151.460	SC Forestry
154.265	SC Forestry
159.270	SC Forestry Common/Coastal
159.375	SC Forestry Huger/Moncks Corner/ Coastal
159.405	SC Forestry Edisto/Coastal
159.450	SC Forestry Coastal
164.625	USFW
164.825	USFS
168.025	USFS
168.675	USFS Wambaw & Witherbee Ranger Districts/Columbia Dispatch
168.775	USFS
170.050	NPS Forts Sumter/Moultrie

Berkeley County

Parts of the city of Charleston, the Francis Marion National Forest, and the naval weapons station lie in the eastern part of neighboring Berkeley County. Berkeley County is a mostly rural county of over 1,200 square miles with a rapidly growing population of 150,000. Berkeley County uses both the Palmetto 800 system and a mixture of conventional VHF/UHF frequencies.

Berkeley County Palmetto 800 TRS Talkgroups

Talkgroup	Description
10960	Hanahan PD
20208	Goose Creek PD
38544	Berkeley SD Chl 1
38576	Berkeley SD Chl 2
38640	Berkeley SD Chl 3
38672	Berkeley SD Narcotics
62736	Berkeley SD Special Ops

Berkeley County Conventional Frequencies

Frequency	Tone	Description
154.0100	127.3	Berkeley North Fireground
154.1900	127.3	Berkeley South Fireground
154.2350	186.2	Goose Creek FD
154.2500	127.3	Berkeley Fire/EMS South Dispatch
154.3550	127.3	Berkeley Fire/EMS North Dispatch
154.4450		Berkeley Fireground
155.6700	186.2	Goose Creek PD
155.8100		Berkeley EMS Ops
155.8125		Berkeley EMS
453.5500	186.2	Berkeley SD Records

Charleston Area Aviation and Milcom

The Lowcountry of South Carolina is a hotbed of Milcom activity. Besides the Charleston Air Force Base and the Charleston Naval Weapons Station, South Carolina is also home to Shaw AFB in Sumter, SC, and Marine Corps Air Station in Beaufort, SC. The airspace and waters offshore contain numerous warning areas and operating areas (OPAREA) under the oversight of the US Navy's Fleet Area Control and Surveillance Facility (FACSFAC) Jacksonville. There is always some activity to be monitored from dogfights and aerial refueling operations in the skies above to carrier strike groups offshore.

A word of warning for those wanting to do some on scene monitoring: Charleston AFB has an active Eagle Eyes program and anyone lingering near the base perimeter can expect to receive a quick and decisive response from security forces personnel. The Weapons Station also reacts in the same manner.

I would recommend that you instead book a room on a top floor of one of the several hotels that ring the airport and you will be treated to a balcony view of the departing and arriving aircraft.

Charleston AFB/Charleston IAP

Charleston AFB is a joint use facility sharing runways with Charleston International Airport (IAP). It is home for 54 C-17 Globemaster III aircraft of the 437th Airlift Wing and its associate Reserve 315th Airlift Wing. The base is also responsible for other property in South Carolina including a practice airstrip at North Auxiliary Airfield near Orangeburg.

Charleston IAP operated by the Charleston County Aviation Authority (CCAA). The Authority also operates Charleston Executive Airport on Johns Island and East Cooper Airport in Mount Pleasant.

CCAA has its own police force which operates on the Charleston County TRS.

Charleston AFB/Charleston IAP Frequencies

Frequency	Description
118.150	North Field
119.300	Approach
120.700	Approach/Departure
121.900	Ground
122.200	Flight Service Station
122.500	Flight Service Station
122.700	East Cooper UNICOM
122.800	Charleston Executive UNICOM
122.950	UNICOM
123.775	Charleston Executive
124.750	ATIS
126.000	Tower
127.150	Charleston Executive Clearance
127.325	Clearance Delivery
129.450	ARINC
131.650	Mercury Air
134.100	Command Post
135.800	Approach/Departure
148.150	Civil Air Patrol F-1
235.775	North Field
239.000	Tower
255.400	Flight Service Station
284.000	Approach
306.925	Approach/Departure
314.450	C-17s Air-Air
317.450	Approach
319.400	Command Post/C-17s Air-Air
344.600	PMSV Metro
340.600	C-17s Air-Air
348.600	Ground
349.400	Command Post
372.200	Pilot to Dispatch
379.925	Approach/Departure
381.600	Clearance Delivery

315/437 AW Callsigns:
BASCO, GOON, IMPAC, LIFTR, MOOSE, PALM, REACH, ROSCOE, THUG, TIN CAN, TONKA, VOLT, WANDO

315 AW Callsign:
GRITS

Charleston AFB Ground Nets

Frequency/Input	Tone	Description
163.0375	110.9	Aircraft Maintenance
163.5875		Aircraft Refueling
165.1125		Ramp Ops/Refueling

165.1625	123.0	Aircraft Maintenance
170.1250	110.9	Net 4 Aircraft Maintenance
173.5625	123.0	Net 3 Aircraft Maintenance
173.5875 /173.5375		100.0 Net 2 Ramp Ops/Aircraft Maintenance
173.6125	186.2	Net 1 Aircraft Maintenance/Life Support
406.5500		Security Forces
407.3500		Ramp Ops/ATOC/ Loadmasters/Cargo
406.7500/100.0		Crash/Fire Rescue
416.1000/407.9500		Security Forces
416.7500		Security Forces
417.7500	123.0	Base Medical/437 AW Wing Ops

Jacksonville ARTCC, Charleston

Frequency	Description
120.125	Ultra High
124.075	High (Summerville Sector)
127.950	Low
132.475	Ultra High
133.625	High (Georgetown Sector)
135.050	High
282.250	Low
307.050	Ultra High
351.700	High (Summerville Sector)
370.950	High (Georgetown Sector)
379.100	Low
381.400	High
399.100	Ultra High

Area Aerial Refueling Tracks

Track	Primary/Secondary
AR-202	327.600/319.700
AR-207	324.600/319.700
AR-216	276.500/319.700
AR-600	348.900/319.700
AR-601	283.900/319.700

Aviation Authority Talkgroups
(Charleston County TRS)

Talkgroup	Description
368	Aviation Authority
400	Aviation Authority Command
432	Aviation Authority
464	Aviation Authority Admin/Maintenance
496	Aviation Authority Maintenance Supervisor
688	Aviation Authority Maintenance
752	Aviation Authority Airport Police

Local MOAs and Warning Areas

A variety of fighters from Shaw AFB, MCAS Beaufort, McEntire ANGS, Seymour Johnson AFB, and Jacksonville IAP make almost daily appearances in the warning areas surrounding Charleston. Often they are joined by visiting E-3 AWACS, E-8 JSTARS, aerial tankers, and navy ships offshore. Sometimes B-1, B-2, and B-52 bombers also make an appearance.

There are several military operating areas (MOAs) north of Charleston. Located within them is the Poinsett Electronic Combat Range and the Poinsett Bombing & Gunnery Range where aircraft can practice gunnery and engage simulated enemy threat emitters.

Offshore are the W-161/W-177 warning areas that extend from Charleston up to Myrtle Beach. At night flares from fighters are often visible from the barrier islands. To the south of Charleston are warning areas controlled by FACSFAC Jacksonville (SEALORD).

Frequency	Description
120.950	Sealord North Primary
127.725	W-161/W-177 Doubleshot Primary
133.950	Sealord North Secondary
254.350	Gamecock C MOA
258.400	W-161/W-177 Doubleshot Discrete
264.700	Poinsett Range Control
265.400	NORAD Combat Air Patrols
269.000	Gamecock D MOA
270.200	NORAD
279.725	W-161/W-177 Doubleshot Primary
284.500	Sealord North Primary
288.200	NORAD/AWACS
303.100	NORAD/AWACS
313.700	Sealord North Secondary
316.300	NORAD/AWACS
335.900	Shaw MOA
335.950	NORAD/AWACS
350.300	Gamecock C MOA
354.300	Poinsett Range
361.800	NORAD/AWACS
364.200	NORAD AICC
381.350	W-161/W-177 Doubleshot Discrete
388.950	NORAD/AWACS

Naval Weapons Station Charleston

Naval Weapons Station Charleston (NWS) is the largest employer in the Charleston area. The Station encompasses more than 17,000 acres of land, 16 miles of waterfront, four piers and 35 miles of railroad. The station also hosts the Navy's Nuclear Power Training Unit and the Charleston Consolidated Brig, a medium security Navy prison with capacity for nearly 300 prisoners.

Frequency	Tone	Description
138.850		Security Roving Patrol
142.650		Quarterdeck, Roving Patrol, Waterfront & Pier Security, Security Boats
143.725		Security Roving Patrol
148.300		Naval Hospital
149.050	123.0	NWS Fire and Police
149.775	141.3	Brig TAC-1
148.800		NWS Perimeter Guardposts/Security, Naval Hospital Security
148.900	123.0	Brig TAC-2
149.100	186.2	Brig TAC-3
150.175	103.5	Munitions/Public Works
150.325		NWS Fire Dept. Incident Command Freq Delta, NWS Security
150.400		Munitions Handlers, Dive Boats
150.550		NWS Fire and Police, Security Boats
150.375		NWS Quarterdeck, Fire, Public Works, Building Maint.

I invite you to come enjoy everything Charleston and the Lowcountry of South Carolina have to offer, and remember to pack your scanner!

ABBREVIATIONS USED

AFB	Air Force Base
ANGS	Air National Guard Station
ARINC	Aeronautical Radio, Inc.
ARTCC	Air Route Traffic Control Center
ATIS	Automatic Terminal Information Service
AW	Airlift Wing
AWACS	Airborne Warning and Control System
CBP	Customs & Border Protection
CCAA	Charleston County Aviation Authority
CCSO	Charleston County Sheriff's Office
DHEC	Department of Health and Environmental Conservation
DNR	Department of Natural Resources
DOT	Department of Transportation
DPS	Department of Public Safety
EMD	Emergency Management Division
EMS	Emergency Medical Services
EPD	Emergency Preparedness Division
FACSFAC	Fleet Area Control and Surveillance Facility
IAP	International Airport
ISO	International Organization for Standardization
MCAS	Marine Corps Air Station
MOA	Military Operating Area
MPFD	Mount Pleasant Fire Department
MPPD	Mount Pleasant Police Department
MUSC	Medical University of South Carolina
NCFD	North Charleston Fire Department
NCPD	North Charleston Police Department
NORAD	North American Aerospace Defense Command
NPS	National Park Service
NWS	Naval Weapons Station Charleston
OPAREA	Operating Area
SCHP	South Carolina Highway Patrol
SD	Sheriff's Department
SPA	South Carolina State Ports Authority
TRS	Trunked Radio System
USCG	US Coast Guard
USCGC	US Coast Guard Cutter
USFS	US Forest Service
USFW	US Fish & Wildlife Service

RESOURCES

RadioReference.com: http://www.radioreference.com/
Charleston AFB: http://public.charleston.amc.af.mil/
Charleston Convention & Visitors Bureau: http://www.charlestoncvb.com/
Charleston County: http://www.charlestoncounty.org/
Charleston IAP: http://www.chs-airport.com/index.htm
Charleston Police: http://www.ci.charleston.sc.us/dept/?nid=19
City of Charleston: http://www.ci.charleston.sc.us/home/default.aspx
City of North Charleston: http://www.northcharleston.org/
Cooper River Bridge site: http://www.cooperriverbridge.org/
Naval Weapons Station: http://www.nwschs.navy.mil/
North Charleston FD: http://www.ncfd.org/
Sheriff's Office: http://www.ccso.charlestoncounty.org/
State Ports Authority: http://www.port-of-charleston.com/
Town of Mount Pleasant: http://www.townofmountpleasant.com/index.cfm?section=1

Tuning into Major and Minor League Baseball: AM, Satellite and On-Line

By Ken Reitz KS4ZR

Despite the fact that television has long ago taken over "America's Pastime," there's no question that the traditional and (some say) best way to enjoy the game is by radio. Baseball fans nationwide have three ways to tune in: satellite radio, on-line, and old fashioned AM radio. All three have advantages and disadvantages, so here's the inside pitch.

Baseball Radio: Majors & Minors

Today we can tune into baseball on anything from a home-brew crystal set, a genuine antique radio, or a brand new AM/FM tuner. The only thing that stops us from listening is propagation and the capability of the antenna. Once the digital era begins and analog AM transmissions cease, all these radios will be museum pieces of historical interest only. Luckily, that day could be at least ten years away, so let's enjoy analog AM radio while we can.

Most flagship stations for Major League Baseball teams (see list below) are AMers, and, while there are a good number of FM stations on various teams' affiliate lists, baseball is mostly an AM sport. These flagship stations have a history, not just with the club, but with the city in which the club plays. Pittsburgh's KDKA is an example: With the honor of having broadcast the first play-by-play baseball game, KDKA remains the flagship station of the Pittsburgh Pirates today.

There are hundreds of radio stations affiliated with the Major League teams. So many, in fact, that we would need several pages to list them in *MT*. So, to help you find a complete list of radio affiliates for your favorite team, go to **www.mlb.com** and click on "Team Sites" at the upper left hand corner. That brings a drop down list of every Major League Baseball team. Now click on your team. That brings you to the home page of your favorite team. Each of these MLB websites is identical. To get to the radio affiliates list, click on "schedule." Now click on "broadcast information" and, finally, click on "radio affiliates" or "broadcast affiliates." There's your list!

Only the New York Yankees (you might have guessed!) and the Cubs don't list their affiliates on their MLB website. You'll find the Yankees' affiliates list at **www.wcbs880.com.** Click on "Yankees on WCBS" then "Yankees Radio Network Stations." The Cubs' list is found at **www.tribuneradio.com/cubsaffilliates.htm**.

In addition to all of these flagship stations, national sports radio network ESPN carries many "games of the week" throughout the season, as well as offering full coverage of post-season play and the World Series. You can find a complete list of ESPN affiliate stations here: **www.espnradio.espn.go.com/espnradio/affiliatebyshow?show=M**

Minor Leagues: Loose and Accessible

Each Major League Baseball team has several minor league teams. These are ranked as single A, double A or triple A. Lower than single A are "rookie league" teams which are essentially initiation teams where high school and college draftees go to be taught the ins and outs of belonging to whichever Major League team drafted them.

All AAA teams have the big league sound on the radio (see list below): full-time announcers broadcast every home and away game. Most A or AA teams do not have full-time announcers, flagship stations, or all-season broadcast schedules. The atmosphere at minor league games is considerably more loose than at the big league level. Fans are able to get close to their local stars before they get called up to the Majors and disappear into the regal cloister of millionaires, leased jets, special security and national sports media scrutiny.

Minor league teams sport whimsical names such as the Albuquerque Isotopes, the Tucson Sidewinders, or the New Orleans Zephyrs. Who wouldn't want to watch the Greensboro Grasshoppers take on the Hickory Crawdads? May the best critter win!

If you don't live within tuning distance of a minor league team, you can catch the action live on-line at **www.minorleaguebaseball.com.** The best part is that it's free!

A Little Help for the AM Band

The baseball season comes at the worst possible time as far as general conditions on the AM band are concerned. Evening thunderstorms nationwide play havoc with reception, and extended daylight hours mean that, by night fall when distant reception is possible, many games are over. AM radios need all the help they can get to boost reception. Here are your options: external or internal antennas, DSP (digital signal processing), and the right radio.

Outdoor antennas are a good idea, but not just any outdoor antenna will do. The big problem with the AM band is noise. Sometimes adding an outdoor antenna simply adds to the noise problem. What's needed is a "low noise" outdoor antenna. The best AM, low noise, outdoor antenna is the Beverage antenna which has been described many times in the pages of this magazine. For those who missed it here are the basics: the Beverage is a long (I mean really long) wire antenna not more than 6 or 8 feet above ground, stretching out in a straight line in

the direction of the desired reception. It's best if it's a wave length or better long.

The best indoor antenna for AM reception is the tried and true tuned loop antenna, such as the Terk or the Select-A-Tenna. No connections to the radio are required. These antennas are simply placed next to the built-in AM antenna on your radio. By adjusting the tuning knob and rotating the antenna, it's possible to turn a barely distinguishable signal into one you can actually listen to. The tuning knob matches the antenna to the actual frequency tuned on the radio and rotating it nulls out stronger signals on or near the desired frequency. Tilting the loop at an angle may also help null offending stations.

Select-A-Tenna: long time staple of the broadcast DX crowd works just like the Terk AM loop. (Courtesy: Grove Enterprises)

Regardless of the capabilities of your antenna and radio, you still have to deal with the other aspects of AM reception, fading and man-made noise. The further away from the transmitter you are, the more effect these have on your reception. There's not much you can do about the fading, but you can cut the effects of man-made noise and other interference with Digital Signal Processing. DSP is a feature on some newer radios, but can also be added to older radios by using an outboard DSP filter such as MFJ's 784B (see photo). The audio is taken from the speaker jack of the radio, processed through the DSP filter and heard on an external speaker. At $250, the 784B is a little pricey, but it also works well on your HF radio when hunting DX on the shortwaves.

MFJ's 784B programmable DSP filter can be a great tuning aid on all bands. (Courtesy: MFJ Enterprises)

Finding just the right radio is a little tricky. Don't assume that the latest production hot seller is going to be the best performer on the AM band. I use a 23 year old Uniden 2021 which was a knock-off of Sony's famous 2020 model. It sold for considerably less than Sony, but the years have proven it was equal. I paid $185 new for the radio from Grove Enterprises in 1983 and today, according to DXing.com, these units still command a $100-130 price tag on the used radio market. I find it a perfect fit with a Radio Shack AM loop antenna. It features direct keyboard entry tuning, a sharp digital display, excellent audio, and takes up very little desk space.

Search the usual venues for such used radios and check out the reviews on DXing.com and eham.net. You'll find some very nice AM performers. Now, let's play ball!

I use this 23 year old Uniden 2021 and a Radio Shack AM loop antenna for AM DXing. Reception is great, the audio is excellent, digital tuning via keypad is great and it's all portable! (Courtesy: Dxing.com)

Tune into MLB Baseball

Major League Baseball Flagship Stations

AMERICAN LEAGUE:

Team	Flagship Station
Baltimore Orioles	WBAL 1090
Boston Red Sox	WEEI 1850
Chicago White Sox	WSCR 670
Cleveland Indians	WTAM 1100
Detroit Tigers	WXYT 1270
Kansas City Royals	WHB 810
Los Angeles Angels	KGAM 1450
Minnesota Twins	WCCO 830
New York Yankees	WCBS 880
Oakland A's	KYCY 1550
Seattle Mariners	KOMO 1000
Tampa Bay Devil Rays	WHNZ 1250
Texas Rangers	KRLD 1080
Toronto Blue Jays	CJCL 590

NATIONAL LEAGUE

Atlanta Braves	WGST 640
Arizona Diamondbacks	KTAR 620
Chicago Cubs	WGN 720
Cincinnati Reds	WLW 700
Colorado Rockies	KOA 850
Houston Astros	KTRH 740
Los Angeles Dodgers	KFWB 980
Miami Marlins	WQAM 560
Milwaukee Brewers	WTMJ 620
New York Mets	WFAN 660
Philadelphia Phillies	WPHT 1210
Pittsburgh	KDKA 1029
San Diego Padres	XPRS 1090
San Francisco Giants	KNBR 680
St. Louis Cardinals	KTRS 550
Washington, D.C. Nationals	WTWP 1500

Tune into AAA Minor Leagues

INTERNATIONAL LEAGUE

Team (affiliation)	Flagship Station
Buffalo Bisons (Cleveland Indians)	WECK 1230
Charlotte Knights (Chicago White Sox)	WFNA 1660
Columbus Clippers (New York Yankees)	WVKO 1580
Durham Bulls (Tampa Bay Devil Rays)	WDNC 620
Indianapolis Indians (Pittsburgh Pirates)	WXLW 950
Louisville Bats (Cincinnati Reds)	WGTK 970
Norfolk Tides (New York Mets)	WGH 1310
Ottowa Lynx (Baltimore Orioles)	www.minorleaguebaseball.com
Pawtucket Red Sox (Boston Red Sox)	WSKO 790
Richmond Braves (Atlanta Braves)	WNIV 950
Rochester Redwings (Minnesota Twins)	WHTK 1280
Scranton Red Barons (Philadelphia Phillies)	WICK 1400
Syracuse SkyChiefs (Toronto Blue Jays)	WNSS 1260
Toledo Mudhens (Detroit Tigers)	WLQR 1470

PACIFIC COAST LEAGUE

Albuquerque Isotopes (Florida Marlins)	KNML 610
Fresno Grizzlies (San Francisco Giants)	KXEX 1550
Las Vegas 51's (Los Angeles Dodgers)	KENO1460
Nashville Sounds (Milwaukee Brewers)	WNSR 560
Oklahoma Red Hawks (Texas Rangers)	KEBC 1340
Portland Beavers (San Diego Padres)	KKAD 1550
Sacramento River Cats (Oakland A's)	KTKZ1380
Tacoma Rainiers (Seattle Mariners)	KHHO 850
Colorado Springs Sky Sox (Colorado Rockies)	KRDO 1240
Iowa Cubs (Chicago Cubs)	KXNO 1460
Memphis Red Birds (St. Louis Cardinals)	WHBQ 560
New Orleans Zephyrs (Washington Nationals)	WIST 690
Omaha Royals (Kansas City Royals)	KMOJ 1490
Round Rock Express (Houston Astros)	KWNX 1260
Salt Lake Bees (Los Angeles Angels)	KJQS 1230
Tucson Sidewinders (Arizona Diamondbacks)	KWFM 1450

On-Line

Listen on-line to each home and away game of your favorite team all season on MLB Game Day Audio for $14.95. Go to **www.mlb.com** and click on "Game Day Audio." In addition, Minor League Baseball teams have broadcasts of their games as well, and the best part is you can listen for free. Go to **www.minorleaguebaseball.com** and click on "MiLB Game Day Audio." Select the team you want to listen to and enjoy! MLB.com also offers podcasts including "MLB Radio Daily," "Around the Minors," and "Radio Rewind."

Satellite Radio

XM Satellite Radio carries all broadcasts of all MLB teams and the play-by-play is included in the $12.95/month subscription fee. Many plans are offered which reduce this fee, and it's possible to subscribe for just the six months of the regular season. In addition to the play-by-play channels, XM also has MLB Home Plate (channel 175) a 24/7 audio service giving score updates, interviews and call-in shows about baseball.

Audiovox Xpress XM tuner: Listen to Major League Baseball at home or in the car all season, no fading, no static, just a $12.95/month fee. (Courtesy: Crutchfield)

Sirius Satellite Radio does not carry MLB, but it does carry the ESPN Radio network which broadcasts "Games of the Week," in addition to broadcasting the Wild Card play-offs, League Championship Series' and World Series games.

MORE AM RESOURCES

AM DX info abounds at www.am-dx.com.
More AM DX info is found at DXing.com.
Check out this home-brew copper loop antenna: www.am-dx.com/loopant.htm.
Reviews of AM DX receivers can be found here: www.eham.net.

"Signal Stalking" at the Ballpark

By James Adkins, KB0NHX

What better way to spend the first warm days of spring than enjoying two of my favorite hobbies: baseball and scanning? Last year, to celebrate the first professional baseball game in Springfield, Missouri, in 50 years, I decided to take a trip to the newly built Hammons Field to take in a game between the St. Louis Cardinals and their double A affiliate, the Springfield Cardinals. Not only was the baseball good, so was the scanning.

Armed with my newest handheld scanner, a Radio Shack PRO-83, I headed off to the ballpark ready to use the "Signal Stalker" feature to sniff out new frequencies (Editor's note: This feature is also called "Close Call" in Uniden scanners). It wasn't five minutes before the scanner came to life with radio traffic! The first traffic was on 451.7125. This frequency was very active throughout the game. On this particular instance I was hearing the box office talking to employees at the front gate. As the game progressed, however, the box office traffic faded away and the in-house security took most of the airtime. Everything from media inquiries for interviews to routine checks of security personnel guarding their posts could be heard.

As the game progressed, so did the on-field events and contests. Seeing radios in use but not hearing traffic, I decided to walk a little closer to the activity to see if the Signal Stalker would detect this new frequency. Sure enough, they were using 462.5625, PL 67.0 Hz, for these communications. Although I did not hear any other radio traffic on the FRS bands, it might be wise to plug all the family radio frequencies into your scanner in case the event organizers switch channels. As far as civilian use, I did not hear any other FRS traffic, however.

Near the end of the game, I decided to stand behind the home plate area. The scanner then Signal Stalked 464.550, a frequency I had not heard in use earlier in the game. This frequency appeared to be used for custodial services. The main traffic I was hearing on this frequency dealt with trashcans being full and messes that needed to be cleaned up.

While standing behind the home plate area, one of the batters lost his bat into the stands. Unfortunately, a lady was struck and injured by the bat. As in house security started coordinating a response to check her status on 451.7125, a Greene County Sheriff's deputy also responded and was heard on 813.2375 calling for an ambulance to respond. When the ambulance arrived, the scanner Signal Stalked 155.280, the ambulance dispatch frequency, as they were asking which gate was closest to the victim. And, after loading the patient up, they could be heard on 155.340 calling the local hospital.

Strong Signals

As a side note, I did hear traffic from outside the stadium as well. Most notable was the simulcast from the 800 MHz system to 154.400 for the Greene County fire traffic. The VHF traffic is transmitted on a tower located at the Springfield 911 center located about 1/2 mile away. And, if you're going to Signal Stalk in a metro area, I'd suggest either using a filter to block out the pagers on the 152 and 158 MHz band or lock them out as the scanner Stalks them. The most common frequency I dealt with was 152.810, as it has a 500W ERP transmitter about 5 blocks away and another 1400W ERP transmitter a couple miles from the ballpark! Needless to say, the scanner will Stalk not only 152.810, but several frequencies above and below the center one.

Lastly, there were several other transmitters that I could not Signal Stalk. First, and probably the weakest, were the wireless microphones used by personnel on the field to talk back to the public address system. I suspect the signal was too weak for the near-field Signal Stalk mode to receive. I also tried to Signal Stalk the TV cameras throughout the stadium. They appeared to be on a wireless network, but I suspect their frequencies were outside the range of my PRO-83 scanner.

As I left the ballpark in the eighth inning, the scanner stalked one last frequency – 481.750. This frequency allowed me to listen to the play-by-play being broadcast on local over-the-air TV on UPN 15! It was great to hear the end of the game as I began the stroll back to the car from an enjoyable day of baseball and Signal Stalking.

About the Author:

James Adkins is the FCC Trustee for the Nixa Amateur Radio Club, Inc. and enjoys working the "forgotten bands" of 6m and 220 MHz. Besides ham radio, James is also an avid scanner listener when he has time between dispatching for the Missouri Highway Patrol and spending time with his wife Kim (KC0GKP) and children Sierra & Kolton.

Ken Reitz, KS4ZR
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Radio Repair: Who Ya Gonna Call?

Scanners, shortwave radios, and ham transceivers can be expensive, and when you buy them new from dealers you get a nice warranty. If anything goes wrong during the warranty period, you send it back, they fix it for free and send it right back to you. But, suppose you buy a used scanner, shortwave radio, or ham transceiver at a ham fest or over the Internet and it croaks within hours, days, or weeks after you bring it home? Unless you dealt with an extremely conscientious seller, you're stuck.

Now the question arises: Is it worth fixing? That's a judgment call only you can make. But, here are some tips which might help beginners get their radios repaired and returned in a timely fashion for as little as possible.

❖ Taking a Chance

Anytime you buy used equipment, even from a friend, you're taking a chance that it will have problems immediately or sometime down the road. But, virtually all modern equipment can be repaired to like new condition. Here are the factors you'll have to consider when sending the radio away: It could take weeks or even months to get the unit back once you send it in; repair facilities charge top dollar for parts and labor, and you'll pay the shipping (including insurance and expedite delivery charges) both ways.

There are hundreds of competent radio repair shops around the country that will do repairs on virtually any radio. Some have better reputations than others. You can read reports on 57 of them at www.eham.net/reviews/products/26. Some of the first hand accounts will make you think twice about sending in equipment, while others will reassure you that if anything goes wrong with your particular radio you can be confident in sending it in. Some report a mix of opinions and it's hard to figure out what's going on back in the shop.

Here's a thumbnail sketch of the top 10 brands and what they offer in the way of customer service. The brand name is followed by the World Wide Web address for customer support and their tips on repairing your radio:

AOR www.aorusa.com/support.html

Offers free operator's manuals in pdf format from a drop-down list on the support page. Repairs out of warranty AOR products. Send your AOR product (no Return Authorization number is required) to AOR U.S.A. 20655 S. Western Ave., Suite 112 Torrance, CA 90501. Their phone number is 310-787-8615 and the tech-support e-mail address is: service@aorusa.com. Charges $20 estimate fee which can be applied to the repair total if you approve the repair. Accepts VISA, MasterCard, personal check or money order. Returns your AOR product via normal ground shipping.

DRAKE www.rldrake.com/tech/return.html

No longer repairs any amateur radio products. Does repair its shortwave receivers at the rate of $25/quarter hour plus replacement parts, return shipping and handling. Here are the Drake recommended steps for out of warranty repairs – Return the Drake product via UPS to: Customer Service Department R.L. Drake Co. 230 Industrial Drive Franklin, OH 45005-4496. Insure the item for full retail value when shipping. Enclose a cover letter with your name, address and daytime phone number. List what you are returning and why. You can speed up the turnaround time by authorizing repairs in the letter and including the credit card information (they use Discover, Visa, MasterCard and American Express). They do not ship C.O.D. Normal turnaround time is 7 to 10 days. The service department phone number is 937-746-6990.

Classic radios such this Drake R7A aren't made anymore, but the R.L. Drake Co. still repairs them. At $100/hour the repair bill could be high, but with this radio it might be worth the price. (Courtesy: Universal Electronics)

ETON (Grundig) www.etoncorp.com/US/support/warranty_repair.aspx?index=8

Eton is the U.S distributor of Grundig and Eton labeled products. Information about warranty repairs can be found at 800-872-2228. Product manuals may be downloaded without charge from an on-line list. An extensive list of antennas and AC adaptors for their shortwave radios is on-line with prices. Out of warranty repairs are referred to one of four unaffiliated independent companies: ACT Electronics 21129 Norwalk Boulevard Hawaiian Gardens, CA 90716 (800-824-7094); Columbus Electronics 1151 Sanford Street Winnipeg (204-775-0435), MAN R3E 3A1; Charles Electronics 11 Charles Street West Toronto, ONT M4Y 1R4 (416-923-5319), EBM Electronics 80 Acorn Place Unit 50 Mississaga, ONT L4Z 4E1 (905-755-9527).

Is the antenna missing on your Grundig Yacht Boy 400 PE? Need a new AC adaptor for it? Don't worry! You can buy 'em on-line direct from Grundig/Eton. (Courtesy: Universal Electronics)

ICOM www.icomamerica.com/support/service_centers.asp

Thousands of these expensive Icom R70 shortwave receivers are still around. If you've got one in need of repair, send it back to Icom and get a repair estimate for $42. (Courtesy: Universal Electronics)

A list of information required by Icom America and service centers may be printed from this web site and shipped with your radio to one of three service centers: Icom America, Inc. Service Department 2380 116th Ave. NE. Bellevue, WA 98004 (425-454-7619); Icom Service Center-Michigan1792 Nash Drive St. Joseph, MI 49085 (269-429-2334); Icom Service Center-South East 1140 Watkins Road Anderson, SC 29625 (864-222-3539). Icom American Inc. Service Center fees are $84.00/hr. Accepts Visa, MasterCard, American Express, money order or UPS C.O.D. A $42 fee will be charged for all estimates and applied to the total. If the estimate is refused, the $42 fee will be charged. Your radio will be returned via UPS ground delivery. Other delivery options are available. Service Department phone: 425-454-7619 Monday-Friday 8-5 PM Pacific time.

KENWOOD www.kenwood.net/?do=AMASupportInfo

Offers a long list of items for customers including instruction manuals, connector diagrams and reprints of technical service bulletins on a wide range of Kenwood products. Even if your Kenwood radio doesn't need repair, you might find it interesting to browse these bulletins. There may be a modification or a fix for some little problem

you've been dealing with for years but didn't want to take the time to send your radio back. There are two service centers: Kenwood Service Center West 17300 Marquardt Avenue Cerritos, CA 90703 (repairs only: 562-483-8740) and Kenwood Service Center East 829 Lynnhaven Pkwy, Suite 130 Virginia Beach, VA 23452 (repairs only: 757-340-1702). If you know the part you need for an amateur radio product, you may order parts from East Coast Transistor 800-637-0388.

RADIO SHACK www.radioshack.com/helpdesk/index.jsp?display=returns&subdisplay=repairs

If you buy products at a Radio Shack store you may return them up to 30 days from purchase for a refund. There is a 90 day limited warranty on products sold by Radio Shack whose manufacturer provides no warranty or a warranty of less than 90 days. Out of warranty you're on you own. Your best bet is to go to the manufacturer and plead your case or check with Radio Labs.com below, which handles some brands needing out of warranty service. Check also with the list on eham.net.

SANGEAN www.sangean.com/contact_service.html

Sangean refers all of its out of warranty work to Radio Labs.com listed below. For warranty replacement contact Sangean America, Inc. 2651 Troy Avenue S. El Monte, CA 91733 626-579-1600.

This Sangean ATS909 retails for $250. If you've got one that's busted, don't throw it away; Radio Labs.com can get it up and running for $40 plus shipping. (Courtesy: Grove Enterprises)

SONY http://esupport.sony.com/US/

Sony customer service is now using this web page for directing your service requests. This is an awkward web site and navigating it is a pain in the neck. You may also not be happy with the "exchange" service cost quoted. Look to other non-affiliated repair companies to help with your Sony repairs. Or make radio repair inquiries at this phone number: 800-222-7669 Monday-Friday between the hours of 9 am and 10 pm. Manuals and specifications can be found on this site for print-out on your computer.

TEN-TEC http://radio.tentec.com/Support

Ten-Tec repairs all Ten-Tec models. They warn: "We are doing component level repair on older models and do not have replacement circuit boards. Although we can repair all older models, the repair cost can exceed the value of the product. Some products are not fully repairable because of the unavailability of components..." Send repairs to Ten-Tec, Inc. 1185 Dolly Parton Parkway, Sevierville, TN 37862. Include a cover letter describing the problem and include your daytime phone number and e-mail address. No RA number required. Non-warranty repair rates are $60/hour. Turnaround time is generally 2 to 5 weeks. Invoice is mailed after the repair is complete and payment via Visa, MasterCard, Discover, American Express, personal check or money order is accepted.

UNIDEN www.uniden.com/repair/index.cfm

For Uniden out of warranty repairs call 800-235-3874 Monday through Friday 8-5 Pacific Time. The repair rate varies from product to product. You'll have to enter the information on-line to find the charge or if the unit can be repaired at all. Older radios, for example, the Uniden HR2510 10 meter transceiver or the Uniden CR2010 shortwave receiver, cannot be repaired by their service department. If the product you have cannot be repaired by Uniden, try Radio Labs.com or find out if any other repair company can handle the job.

YAESU www.yaesu.com/?cmd=ContactUs&DivisionID=65

Yaesu advises you to pack your radio for return thoroughly, using the original box inside an additional box and ship via UPS to: Vertex Standard USA Attn: Amateur Repair 10900 Walker Street, Cypress, CA 90630. In your accompanying letter describe the problem in detail and include your home phone number, return shipping address (no P.O. Box) and your e-mail address. Call the service department at 714-827-7600 for rates and other repair details not published on their web site.

Radio Labs

This northern California company does out-of-warranty repairs on some popular shortwave radios and scanners. They have dramatically reduced the number of brands they repair. Those still covered include Lowe, Yupiteru, Sangean, and Uniden. Go to www.radiolabs.com/repair/radiorepair.html and fill out the on-line repair form. They also offer a modified version of the popular Sangean 909 for $329.95. The mods include tuning detent, increased AM/SW reception, blue LCD display, FM/SW external antenna jack and "much more." They will modify your old 909 for $109.95.

They report that radio repair time is currently running between 25 and 30 days. A difficult repair could take 60 days or longer and they will contact customers in such a case. If the cost of your radio repair is over the listed amount on the repair page they will call with a repair estimate. They don't repair tube radios. Cost of repairing most Sangean models is $40 plus shipping. The ATS-808 is $45 plus shipping. They are not currently repairing AOR, Grundig, Icom or Sony radios.

❖ Last Word

Most hams have closets full of completely busted radio gear. If one of these people offers to give you such a radio, do a little research before you take it. There's a good chance that for $100 or less you can get it back to "like new" condition and get years of enjoyment out of it. On the other hand, it could be one of many models or brands which are simply no longer repaired. Take it to a recycling center instead of the land fill. Many counties operate such installations for the recovery of electronic components. If they require a fee for accepting such electronic junk, pay it. There's no longer any room in any of our landfills for untreated toxic waste.

ASK BOB

GENERAL QUESTIONS RELATED TO RADIO

Bob Grove, W8JHD
bobgrove@monitoringtimes.com

Q. *Frequency lists for scanner listening are commonly available, but in what part of the spectrum would we find satellites? (Bobby Hill, Houlka, MS)*

A. VHF and UHF satellites and terrestrial communications actually share the same parts of the spectrum, side by side. For example, communications, navigational, commercial and scientific satellites may be found in the 136-138, 148-150, 225-270, 400-406 and 460-470 MHz bands. Hams operate satellites in the 29, 146, and 435-438 MHz bands. The same pattern continues far into the microwave region.

Q. *I have compared a discone antenna to the Grove ScanTenna, and notice that there are some UHF frequencies that the discone seems to hear better. What could be the reason for this? (Rich Newbould)*

A. There are two possible reasons for this:

1. The discone has a predictable level of performance – it is like a quarter-wave ground plane on any frequency within its design range (typically an 8:1 bottom-to-top frequency ratio).

The Scantenna, because of its larger aperture (signal-capturing area) has gain over a discone on virtually all of its design frequencies, but because it's a dipole cluster, it is more periodic – that is, it doesn't perform evenly and continuously from top to bottom in frequency like the discone does.

2. Because the discone sits atop the mast, it has much better uniformity in its non-directional (omni-directional) pattern. If the Scantenna could be suspended in free space (or above the mast) it, too, would be non-directional in response, but it sits alongside the metal mast, so there is some reflectivity from that mast which results in minor directivity.

Tune in the UHF signal that is in question, and rotate the mast or Scantenna to see if that improves the situation.

Q. *I have a VHF antenna atop a 30-ft mast for marine-band monitoring here on the coast, but my reception is still limited. What are some general recommendations? (Mike Kreitzer)*

A. Assuming the receiver or scanner still has its factory sensitivity (better than 0.5 microvolts), here are some of the most likely options:

1. At least double the antenna height;
2. Add a mast-head preamplifier at the antenna to compensate for feedline loss;
3. Switch to lower-loss coax;
4. Replace the antenna and/or feedline and connectors if they look corroded;
5. Replace the antenna with one of higher gain; if you go to a directional beam, you will need a rotator.

Q. *I know this may sound paranoid, but I have a feeling that a neighbor might have a radio transmitter as a listening device somewhere in my home. What are the easiest options to verify this? (Name withheld)*

A. Many dealers, including Grove Enterprises, sell test equipment at all pricing levels to detect the presence of radio-frequency-emitting devices. The simplest (and thus cheapest) of these is the EMR (electromagnetic radiation) detector, or field strength meter (FSM). Consult the Grove catalog for some excellent choices, or visit their web page at **www.grove-ent.com/govtestequipment.html**.

The small, hand-held devices are simply broadband radio-frequency detectors which respond to a signal by a sound, light or meter deflection. They are moved around a room as you search for indications. But they aren't single-frequency devices, so they pick up composite signals from everything from power-line noise to oscillators in your consumer electronics.

By far, the instrument favored by the professionals is the spectrum analyzer. They cost thousands of dollars, but they are thorough and they are diagnostic.

Q. *I want to feed two scanners with one antenna. Which is the best route to go, a BNC "Tee" to tie all three connectors together, or a two-way, F-fitted, TV-style, VHF/UHF splitter? (Several readers)*

A. To answer that question, I used a BNC Tee and appropriate adaptors to connect my scanner and AR5000 antenna ports together into a single coax feedline from my antenna, measuring the signal strengths at 100, 150 and 860 MHz. I repeated the experiment with a standard TV-style U/V splitter.

There was virtually no difference at all – signal levels were nearly identical (typically with a dB or so). Even the "pop-pop" noise of the scanning sequence of the Bearcat could be heard on the AOR receiver with both the Tee and the splitter.

The advantages to using the splitter are: (1) The isolation between the two feeds should attenuate some oscillator radiation from one receiver into the other; (2) F connectors and adaptors for RG-6/U are easier to find and mount, and they're cheaper, too! And (3) RG-6/U low-loss coax is quite inexpensive compared to RG-8/U, and its loss characteristics clear up to 1 GHz are virtually identical.

Just be sure the splitter is intended for wide-frequency coverage (VHF/UHF or "V/U"). My unit, marked 5-1000 MHz, worked fine through 2.5 GHz, the upper limit of my listening range; it also worked well down through the AM broadcast band. And make sure you use good-quality connectors, the fewer adaptors the better, and well-shielded, low-loss cable like RG-6/U.

Q. *If I already have my outdoor feedline connected to a grounding block leading to an 8-ft copper rod in the ground, do I still need a lightning arrestor also connected to the ground rod? I already have an in-line coax surge protector in the shack. (Matt Stanley)*

A. Only one device is necessary in the feedline.

There are three types of lightning arrestors: air gap, solid state, and gas discharge.

Air gaps were primarily in use during the vacuum tube days, when a few hundred volts wouldn't hurt anything, but thousands of volts would be discharged; they are not protective of modern, solid-state equipment that is vulnerable to such high voltages.

Solid state devices, essentially diodes, are surge suppressors; they conduct when voltage above a preset level are present. While they work well to protect line-voltage circuitry, the diodes are often lossy at radio frequencies, so are rarely used as lightning arrestors.

Gas discharge units are essentially small, glass envelopes with a gas that ionizes easily (like a neon bulb); that is, becomes electrically conductive at fairly low voltages. This is the type that is most commonly used on solid-state equipment because they permit sizeable discharge currents, and are not generally lossy to RF signals.

But the bottom line is that nothing will survive a direct lightning hit; these devices all have a limit of protection from voltages induced by nearby, not direct, strikes. Always disconnect antenna lines from equipment in advance of an electrical storm if you are in a lightning-prone area.

Questions or tips sent to Ask Bob, c/o MT are printed in this column as space permits. Mail your questions along with a self-addressed stamped envelope in care of MT, or e-mail to bobgrove@monitoringtimes.com. (Please include your name and address.)

MT HELP DESK

SPECIFIC FREQUENCY AND EQUIPMENT QUESTIONS

Larry Van Horn, N5FPW
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Q. *Are the USAF KAWN fax frequencies gone? Greg, Marietta, Georgia*

A. I have not seen any of these frequencies reported in quite some time. None of the current DoD instructions I could find online mention these broadcasts. My best guess: if they are still around they are only used for on-demand transmissions.

Q. *With the new APCO-25 capable scanners now on the market (such as the Uniden BC-396), at some point I'd like to purchase one. As it is, I live in Rapides Parish, LA, which uses a Motorola Type II system. Thus, I can't justify upgrading from my BC-250, unless I move back to New York State. Just in case I'm missing something P25 here in Rapides Parish and don't know it, can you tell me – What does APCO-25 sound like on a conventional scanner? Can you tell there is something there, even if your scanner can't decode it? If there is something P25 in this area, that certainly would be added incentive to upgrade. Bill Seamans, Louisiana*

A. Given the massive shift by the federal government, military and public safety agencies over to the P25 protocol, if I was updating my listening post, a P25 capable scanner is a must. As far as Rapides Parish in Louisiana, you should seriously consider a P25 scanner as soon as possible, thanks to the state's new LAITE trunk radio system.

In the aftermath of Katrina, the State of Louisiana is putting in a new P25 700 MHz interoperability trunk system statewide known as the Louisiana Totally Interoperable Environment (LATIE) radio system. This system will provide 700 MHz P25 digital voice communications with users across the state including LSP, Sheriff's Departments, Fire, Police, National Guard, Health Department, Game and Fish, United States Marshals, up to about 40,000 Public Safety users. Even the New Orleans Public Safety system is now dumping their M/A-Com ProVoice system for this new 700 MHz P25 system.

You can learn more about this new Louisiana Statewide Trunk System on their official page at **www.lsp.org/interoperability.html.** Matt Outlaw has a scanner site that has hobby related information on LAITE at **www.scanningarkansas.com/LATIE.html.**

And if you want to hear what P25 digital voice sounds like, go to Gary Hahn's Digital Modes Sample page at **www.kb9ukd.com/digital/.**

Q. *I really like Monitoring Times, and have a question about scanner laws in California. Per my understanding, I can't use a scanner in a vehicle in California if it's in the furtherance of a crime. What I'm wondering is...have you heard of anyone caught for speeding who has then been prosecuted for violating the California scanner law? Is this enforced, and if I'm caught speeding and they become aware of my scanner, will they take it? David, California*

A. We have never received a report of anyone who received a ticket for speeding getting their scanner seized under California state statue. I don't believe that speeding is considered a criminal offense (unless other factors are involved) so it looks like Section 636.5 (below) would not apply. From the *MT* Online Reference Library:

California State Law

Most of its laws can be found under Chapter 1.5, Title 15 Miscellaneous Crimes, California Penal Code, Sections 630 to 637.9 and cover the gamut of eavesdropping violations. However, of all the sections, one is of particular interest to the scanner listener – section 636.5 titled "Police Radio Communications; prohibited interceptions; penalty."

Section 636.5 prohibits any person who is not authorized by the sender, to intercept any public safety radio service communication, by use of a scanner or any other means (such as online scanner audio on the Internet), for the purpose of using that communication to assist in the commission of a criminal offense or to avoid or escape arrest, trial, conviction, or punishment. It also punishes those who divulge to any person he or she knows to be a suspect in the commission of any criminal offense, the existence, contents, substance, purport, effect or meaning of that communication concerning the offense intending that the suspect avoid or escape arrest, trial, conviction, or punishment. Violations of Section 636.5 in California are considered a misdemeanor punishable by a fine or jail for less than one year or both.

Section 636.5 goes on to say that, "Nothing in this section shall preclude prosecution of any person under Section 31 or 32."

Sections 31 and 32 of the California Penal Code are the state statutes that deal with and explain the liability of principals to a crime, those primarily involved in the planning and execution of criminal activity, and those who are mere accessories to a crime.

Section 636.5 defines "public safety radio service communication" as a communication authorized by the Federal Communications Commission to be transmitted by a station in the public safety radio service. This is a common definition used by other states as well.

You can find out more about this at **www.monitoringtimes.com/html/mtlaws_oct03.html.** *Disclaimer: The information provided in this column is for informational use only. Nothing here should be construed as specific legal advice. Persons wishing legal advice for their particular situation should consult an attorney licensed in their jurisdiction.*

Q. *I live in Gulf County in Florida, and for the most part it was a two frequency system for the police. The county used 460.500 MHz for their dispatch and the city of Port St. Joe used 460.125 for theirs. A few months back, a fellow told me that the county was set to move to a 800 MHz frequency. So they have pretty much disappeared from the UHF frequencies except for the ambulance using the old 460.500 MHz frequencies for a backup and page out channel. I have done searches on the FCC site and haven't found anything at all that shows where they might have moved to. The State M/A Comm system shows up along with a joint task force system in the county, but even so, wouldn't the county show a license for those frequencies had they moved there? Anonymous*

A. The Gulf County Sheriff has moved to the Florida Statewide Law Enforcement Radio System (SLERS) M/A-Com ProVoice trunk system. They are considered a third party user of this new statewide system. The list of third party users as of May 2006 are:

- Baker County Sheriff's Office
- Franklin County Sheriff's Office
- Glades County Sheriff's Office
- Gulf County's Sheriff's Office, Emergency Medical Service and Port St. Joe Police Department
- Hillsborough County Sheriff's Office (interoperability)
- Social Security Administration's Office of Investigations in Florida
- Sumter County Sheriff's Office (interoperability)
- U.S. Fish and Wildlife Service
- Wakulla County Sheriff's Office

Other agencies are included in the 800 MHz system by statutory reference (s. 282.1095, F.S.) or by acceptance into the Governor's Enterprise-wide Sharing of Resources Model. Both categories of members receive equipment and services as provided by the M/A-COM contract. The statutory agencies are:

- Department of Business and Professional Regulation/Division of Alcoholic Beverages and Tobacco
- Department of Highway Safety and Motor Vehicles/Division of Florida Highway Patrol
- Department of Law Enforcement/Criminal Investigations and Forensic Science Services
- Fish and Wildlife Conservation Commission
- Department of Environmental Protection/Division of Law Enforcement
- Department of Corrections
- Department of Financial Services/Division of State Fire Marshal
- Department of Transportation/Motor Carrier Compliance Office

Unfortunately, SLERS is not a P25 system; therefore it cannot be monitored on any publicly available scanner, and is on my *Non-P25 Hall of Shame*.

And that is it for this month. I appreciate all the great questions. If you have a question for the *MT Help Desk,* send it to the email address in the masthead. Until next month, 73 and good hunting.

Dan Veeneman
danveeneman@monitoringtimes.com

The Tangled Web of Interoperability

Things don't always go as planned. Despite the best efforts of public safety agencies and municipal governments, sometimes things go wrong. This month we take a look a few radio systems that haven't lived up to their potential.

❖ Cape May County, New Jersey

Middle Township is located in Cape May County, New Jersey. The 70 square mile municipality lies south of Atlantic City on the peninsula between the Atlantic Ocean and Delaware Bay. The county is a popular summer destination for beach-goers, especially the city of Cape May. The county seat is located in the town of Cape May Courthouse in Middle Township.

Middle Township Police have been operating on analog radios because their new digital equipment doesn't work correctly. The Township had been undergoing a $1.3 million upgrade for public safety departments to improve service and increase coverage in marginal areas. The dual mode (analog and digital) system went live in January 2005 and quickly began receiving complaints from police offers about garbled transmissions when operating in digital mode. After nearly a year of negotiation, the equipment supplier agreed to replace about $150,000 worth of hardware. The replacement effort should be completed this summer.

The township has also begun using vehicle-mounted mobile data terminals to run license plates and check criminal databases, which should help to reduce the amount of voice traffic on police frequencies.

The Middle Township Police Department has 46 officers, including 28 in a Patrol Division and four in a Street Crimes Division. Eight are members of the SWAT team. The Department also employs nearly two dozen dispatchers and administrative personnel. Besides the township, they dispatch for Dennis Township and Woodbine.

When interviewed about the upgrade, the township Chief of Police did mention his belief that moving to digital radios would help to avoid alerting criminals to the location and activity of police patrols. However, in at least one reported case, keeping a closer eye on the local police would have been a good idea. According to a 2002 news item, a Middle Township police detective announced his retirement after admitting to "conduct unbecoming a public employee." Apparently a civilian accomplice told a local prosecutor that the detective taught the accomplice how to monitor cellular telephone calls and collect damaging information from those calls. The detective would then use that information to obtain search warrants.

Until the digital equipment is replaced, you should be able to hear Middle Township police dispatch on 154.875 MHz. Local and county police agencies in the Delaware valley may also use 156.210 MHz to share information and coordinate operations. The Sheriff can be heard on 154.785 MHz and Crime Watch is listed as 154.085 MHz.

Fire dispatch can be heard on 154.130 MHz, although that is also the County Fire dispatch frequency, so listen carefully for the municipality involved. County fireground 1 and 2 are on 154.190 and 154.250 MHz, respectively. The township is also licensed for fire operation on 155.055 MHz and mobile-to-mobile on 158.955 MHz.

The township Emergency Medical Services (EMS) shares 155.295 MHz with the County as well. They are also licensed for 151.385 MHz. You may hear County EMS operations on 155.280 and 155.340 as well.

A number of repeater sites serve these frequencies, including 31 Mechanic Street and 115 South Main (the Ambulance Building) in Cape May Court House, the Adams Avenue Water Tank in Woodbine, and a tower on Highway 9 in Marmora.

If you're traveling down to Cape May City, be sure to check 154.965 for their police dispatch. Fire and EMS are the same as Middle Township and are shared by the County. You may also want to check 151.010 (County Traffic) and 158.820 MHz (County Public Works/Road Department). County Information (CAPECOM) is listed as 155.190 MHz.

County Emergency Management can be heard on 155.745 MHz and related mobiles on 153.785 MHz. If the Atlantic hurricane season proves to be as busy as predicted and a storm approaches the mid-Atlantic seaboard, these may be very useful frequencies to monitor.

The county also has a license for 11 handheld radios for administrative use operating on 453.1500 MHz. Mobile radios for municipal utilities can be heard on 453.9125 and 458.9125 MHz. These are all low power units, so you would have to be nearby in order to catch transmissions from them.

❖ Peoria County, Illinois

As reported in the November column, Peoria County in northwestern Illinois is working toward the purchase of a new radio system from hardware provider M/A-COM.

Severe weather during this past Easter weekend in the county highlighted some of the limitations of the old network. Hail, high winds and a tornado resulted in a usually large number of police, fire and ambulance calls. These calls had to be dispatched on a limited number of available channels. Especially affected were the volunteer fire departments, which share a single frequency (462.975 MHz) across the county. With so many calls coming in, firefighters and paramedics had to wait their turn to use the frequency, leading to delays and additional risk to life and property.

The new system, priced at over $21 million, is expected to relieve the congestion by using additional frequencies and sharing them among users by trunking rather than conventional operation. Unfortunately, the county authority with the responsibility to select a new system has about half of the needed funding and is looking at a number of alternatives. The Emergency Telephone System Board, comprised of 14 police and fire representatives and one civilian, must decide how best to meet the radio needs of county public safety agencies. This may include increased fees to county residents, a phased approach to construction of new system, or even reconsidering of using M/A-COM as a vendor. Recent experience with M/A-COM hardware in the Peoria Fire Department has raised concern among some board members.

Last year the Peoria Fire Department bought about $300,000 worth of radio equipment from M/A-COM. After installation, a number of glitches appeared, including in-

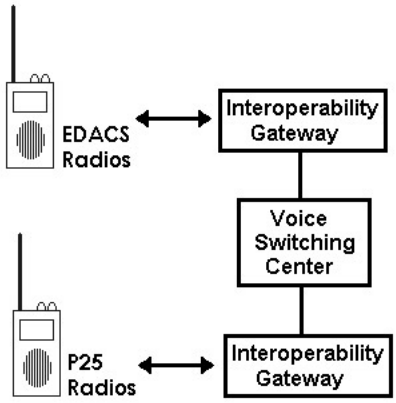
termittent operation on fire engine radios and portable microphones that failed when exposed to high heat. In some instances, portable radio failures occurred in burning buildings when a firefighter required assistance.

To their credit, M/A-COM has worked to correct the glitches and replace faulty equipment. However, it's left some doubt about the reliability of the new system that M/A-COM is proposing.

❖ Colorado

The State of Colorado is facing an interoperability problem. When the shootings at Columbine High School in April of 1999 revealed that the hundreds of emergency personnel who responded were unable to use their own radios to communicate with each other, the state legislature began authorizing expenditures for local radio systems. However, apparently there were no "lessons learned," because the legislature still failed to specify requirements for interoperability. Meanwhile, the state has spent more than $130 million on a statewide radio system, but fewer than half of local public safety agencies in the state use or connect to it.

In addition, two decades ago the City of Denver decided to purchase an EDACS (Enhanced Digital Access Communication System) network. This triggered a chain reaction among nearby communities, who also chose EDACS in order to work smoothly with Denver. Besides city services and public safety, suburbs including Aurora, Lakewood and Westminster also use EDACS. Denver International Airport (DIA) operates an EDACS network as well.



Linking Dissimilar Radio Systems

Unfortunately, EDACS radios are incompatible with the statewide Motorola system.

Denver did purchase a $2 million "patch" that allows their EDACS equipment to communicate with other types of radios. The patch is a M/A-COM product called "Network First" which uses an Internet Protocol (IP) based voice switch and a series of analog voice interfaces. Once the voice traffic is converted to IP, it can be moved over existing computer networks. By having interfaces for both EDACS and the Colorado state system, Denver can handle conversations directly rather than having to relay them through dispatchers.

The State expects to spend nearly $30 million over the next year in various interoperability efforts, with a goal of 90 percent. Most of the money will go to a number of cities and urban communities for equipment to bring them into line. The state has also begun to demand that local agencies provide a plan to interoperate with the statewide radio system. If they fail to develop a reasonable plan, the state may withhold funding.

❖ Federal Report Cards

This year the Department of Homeland Security (DHS) announced their intention to evaluate the ability of public safety communications to interoperate with their neighbors and with federal agencies. These evaluations will highlight shortcomings in existing and planned systems and identify improvements that need to be made.

Common problems exist among many radio systems, including the lack of coordination plans among agencies and municipalities. Many areas are lacking a set of guidelines that specify who is in charge, what messages and activities have priority, and agreement on what frequencies and codes to use. Even in places that do have such guidelines, training and practice are often neglected.

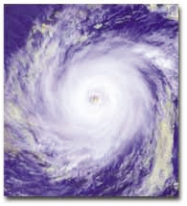
DHS has spent more than $2 billion to pay for state and local communications efforts. They have also created example guidelines and provided assistance in implementation.

Despite these efforts, DHS has come under criticism for their slowness in adopting a standard for interoperable wireless communication. Within DHS, the Science and Technology Directorate is responsible for issuing such a standard, but doesn't plan to do so until the end of 2007. Until then, the Office for Interoperability and Compatibility is supporting the APCO Project 25 standards, already in use by many public safety agencies.

DHS reports that only one of the eight P25 standards is complete, and therefore will not adopt P25 "because it is incomplete and only a single manufacturer builds Project 25 radio infrastructure." The Department expects three more P25 standards to be finished by the end of 2007, at which point they may adopt P25 as their recommended standard.

Once that occurs, it may become more difficult for states and municipalities to purchase equipment that does not meet DHS recommendations.

Meanwhile, networks continue to operate in an uncoordinated fashion. For instance, the First Response Coalition (FRC), an association of public safety and health groups, recently reported that wireless communication systems in states at risk from hurricanes are still unable to meet the challenges of a severe storm. The 2005 hurricane season produced 15 hurricanes, seven of them considered "major." The 2006 season is predicted to be nearly as bad. FRC reviewed radio interoperability in eight coastal states: Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Texas. They concluded, "many hurricane zone states remain dangerously unprepared for another disaster."



State-by-state comments include:

- Alabama lacks a statewide system and state agencies are unable to communicate with local public safety departments.
- Florida's statewide system only links state agencies, leaving local groups to operate on their own limited networks. Lack of funding prevents many of these groups from joining the state system.
- Even when complete, the Georgia "statewide" system will only cover about 80% of the state, and won't be finished until after the 2006 hurricane season ends.
- In Louisiana, state agencies are unable to communicate with local public safety departments. In addition, conflicts between agencies have slowed what little progress was being made.

- Mississippi has more than 40 different radio systems across the state. Many local agencies have no interoperability capability at all.
- Many local agencies in North Carolina have decided not to join the statewide system due to concerns over reliability and cost.
- Although South Carolina has a very capable statewide network, it is only available to state agencies and those local groups that can afford the significant costs to join.
- Many local agencies in Texas lack funding to upgrade equipment to join the statewide system.

The report also notes the difficulty of tracking federal funds once they've been received by the state, making it a challenge to measure progress against money spent.

The report recommends that the Department of Homeland Security complete their interoperability efforts, including coordination with state and local agencies to establish regional emergency communications interoperability. They also suggest better tracking of funding, and holding agencies accountable for the money they receive.

❖ Alameda County, California

Sometimes population growth is a good reason to upgrade. Alameda County sits in the East Bay region of greater San Francisco, California, and covers a land area of more than 700 square miles. The 2000 population of about a million and a half residents continues to grow and is expected to approach two million over the next twenty years.

The County has begun construction of a new 800 MHz trunked digital radio system using APCO Project 25 (P25) standards. This will replace the existing analog system and help to ease frequency congestion for the 100-plus agencies using it. Officials also hope the new system will serve as the starting point for a regional system that will include agencies in other counties as well as the Federal Government. The choice of P25 was made in part to allow interoperability with other state and federal agencies.

The county currently operates a Motorola Type II analog trunked network on the following frequencies: 866.1500, 866.4250, 866.8000, 866.9375, 867.1500, 867.2500, 867.4000, 867.6750, 867.7750, 867.9250, 868.0375, 868.0875, 868.2000, 868.2250, 868.2750, 868.3625, 868.4375, 868.6500, 868.7125, 868.7625 and 868.9250 MHz.

Talkgroups in use include:

Decimal	Hex	Description
16016	3E9	Sheriff Dispatch (West)
16048	3EB	Sheriff Dispatch (East)
16080	3ED	Sheriff Dispatch (Peralta College)
16112	3EF	Warrant Service (West)
16144	3F1	Sheriff Tactical 7
16176	3F3	Sheriff Tactical 8
16208	3F5	Investigation
16240	3F7	Warrant Service (East)
16272	3F9	Warrant Service (Peralta College)
16304	3fb	Highland Hospital
16336	3fd	California Law Enforcement Mutual Aid (CLEMARS)
16432	403	Interagency Common
16464	405	Sheriff Administration
16496	407	Animal Control (West)
16528	409	Coroner
16592	40D	Marshal (Transport)
16624	40F	Court Bailiff
16656	411	Marshal (Berkeley)
16688	413	Marshal (Oakland)
16720	415	Marshal (Alameda)
16752	417	Marshal (Hayward)
16784	419	Marshal (Fremont)
16816	41b	Marshal (Livermore)
16848	41D	Office of Emergency Services (Countywide)
16880	41F	Office of Emergency Services (Common)
16912	421	Office of Emergency Services (East)
16944	423	Office of Emergency Services (West)
16976	425	Sheriff Tactical 9
17200	433	Mutual Aid Law Enforcement
17328	43B	Camp Parks
17360	43D	Sheriff Tactical 4
17648	44F	Fire Tactical 5
17680	451	Fire Tactical 6
17712	453	Fire Tactical 7
17744	455	Fire Tactical 8
17776	457	Fire Tactical 9
17808	459	Fire Tactical 10
17840	45B	Fire Tactical 11
18000	465	Fire Prevention 1
18032	467	Fire Administration 1
18064	469	Fire Administration 2
18096	46B	Fire Prevention 2
18128	46D	Fire Training 1
18160	46F	Fire Training 2
18192	471	Sirens
18480	483	Fire Dispatch 1
18800	497	Mutual Aid FIRE
19120	4AB	Emergency Broadcast (County Sheriff)
19184	4AF	Emergency Broadcast (County Fire)
19216	4B1	Roads 1
19248	4B3	Roads 2
19280	4B5	Roads 3
19312	4B7	Roads 4
19344	4B9	Roads 5
19376	4BB	Roads 6
19408	4BD	Roads 7
20400	4FB	Mutual Aid
20784	513	Emergency Broadcast (Public Works)
22000	55F	Mutual Aid EMS
22384	577	Emergency Broadcast (Medical)
22416	579	Radio Services
23600	5C3	Mutual Aid
25616	641	District Attorney
25648	643	District Attorney
33584	833	Emergency Broadcast (San Leandro Police)
33616	835	Paratransit (West 1)
33648	837	Paratransit (West 2)
33680	839	Paratransit (East 1)
33712	83B	Paratransit (East 2)
36784	8FB	Emergency Broadcast (Fremont Fire)
38416	961	Narcotics Enforcement
38448	963	Narcotics Enforcement
38928	981	Narcotics Enforcement
43728	AAD	Fire Dispatch 2
43760	AAF	Fire Control 3
43792	AB1	Fire Control 4
48816	BEB	Fire Tactical 12
48848	BED	Fire Tactical 13
48880	BEF	Fire Tactical 14
48912	BF1	Fire Tactical 15
48944	BF3	Fire Tactical 16
48016	BB9	Mutual Aid Tactical 1
48048	BBB	Mutual Aid Tactical 2
48080	BBD	Mutual Aid Tactical 3
48112	BBF	Mutual Aid Tactical 4
64016	FA1	Pleasanton Police
64048	FA3	Livermore Police
64304	FB3	Livermore/Pleasanton Fire

The City of Berkeley, famous in so many ways, operates independently on a number of conventional frequencies (perhaps the only "conventional" thing about the city):

Frequency	Description
153.830	Fire/EMS
154.190	Fire/EMS Dispatch
154.235	Fire/EMS
154.355	Fire/EMS
154.430	Fire/EMS
453.525	Special Events
453.800	Special Events
460.050	Warrants
460.175	Police (Dispatch)
460.250	Police (Secondary)
460.300	Police Car-to-Car
460.400	Police Car-to-Car
460.475	Police Car-to-Car
464.300	Berkeley High School Police

Also in the city is the University of California at Berkeley, which operates a Motorola Type II analog system on these frequencies: 866.1750, 866.4875, 866.9875, 867.4875, 867.9875, 868.4875 and 868.8625 MHz.

Decimal	Hex	Description
80	005	Police 1
240	00F	Office of Emergency Preparedness
272	011	Announcement system
496	01F	Police 2
592	025	Police 5
656	029	Police 3
688	02B	Police Simulcast
752	02F	Fire Simulcast
912	039	Parking and Transportation
944	03B	Buses
1072	043	Physical Plant
1104	045	Physical Plant
1168	049	Physical Plant
1232	04D	Warehouse
1392	057	Information Technology
1584	063	Maintenance
1648	067	Security
2416	097	Police 4

That's all for this month. Enjoy the summer, but if you do find yourself near a computer you can check my website at **www.signalharbor.com** for more detailed information on scanners, frequencies and other radio-related material. I also welcome electronic mail at *danveeneman@monitoringtimes.com*. Until next month, happy scanning!

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250 Channels • 5 banks • PC Programmable

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Frequency Coverage: 25.0000-54.0000 MHz., 108.0000-174,.0000 MHz., 400.0000-512.000. MHz., 806.0000-823.9950 MHz., 849.0125-868.9950 MHz., 894.0125-956.0000 MHz.

The Bearcat BCT8 scanner, licensed by NASCAR, is a superb preprogrammed 800 MHz trunked highway patrol system scanner. Featuring TrunkTracker III, PC Programming, 250 Channels with unique BearTracker warning system to alert you to activity on highway patrol link frequencies. Preprogrammed service searches makes finding interesting active frequencies even easier and include preprogrammed police, fire and emergency medical, news agency, weather, CB band, air band, railroad, marine band and department of transportation service searches. The BCT8 also has preprogrammed highway patrol alert frequencies by state to help you quickly find frequencies likely to be active when you are driving. The BCT8 includes AC adapter, DC power cable, cigarette lighter adapter plug, telescopic antenna, window mount antenna, owner's manual, one year limited Uniden warranty, frequency guide and free mobile mounting bracket. For maximum scanning enjoyment, also order the following optional accessories: External speaker **ESP20** with mounting bracket & 10 feet of cable with plug attached $19.95. Magnetic Mount mobile antenna **ANTMMBNC** for $29.95.

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Suggested list price $799.95/**CEI price $519.95**

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

Frequency Coverage:

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

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

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Bearcat 796DGV 1,000 channel Trunktracker III base/mobile	$519.95
Bearcat BCD396T APCO 25 Digital scanner with Fire Tone Out	$519.95
Bearcat 246T up to 2,500 ch. Trunktracker III handheld scanner	$214.95
Bearcat Sportcat 230 alpha display handheld sports scanner	$184.95
Bearcat 278CLT 100 channel AM/FM/SAME WX alert scanner	$129.95
Bearcat 248CLT 50 channel base AM/FM/weather alert scanner	$104.95
Bearcat 92XLT 200 channel handheld scanner	$109.95
Bearcat 72XLT 100 channel handheld scanner	$99.95
Bearcat BR330T up to 2,500 ch. Trunktracker III with Tone out	$274.95
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AOR AR3000AB Wide Band base/mobile receiver	$1,079.95
AOR AR5000A+3B Wide Band 10 KHz to 3 GHz receiver	$2,599.95
AOR AR8200 Mark IIIB Wide Band handheld scanner	$594.95
AOR AR8600 Mark II Wide Band receiver	$899.95
AOR AR-ONE Goverment/Export sales only 10 KHz-3 GHz	$4,489.95
Scancat Gold For Windows Software	$99.95
Scancat Gold for Windows Surveillance Edition	$159.95

Bearcat® BC246T Trunk Tracker III

Suggested list price $399.95/**CEI price $214.95**

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

Frequency Coverage:

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

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

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A Hobby in Transition

On April 10, 2006, the president of Worldwide Utility News (WUN, pronounced like "One") made a terse and very unexpected announcement on his utility radio club's 1300-member Internet mailing list. He said, about halfway down a long letter, that lack of staff had forced this pioneer utility radio club to close down completely and permanently on the 15th.

To say that this came as a shock would be an understatement. People who'd been at this for any length of time knew WUN as a real class act. In fact, the 10-year-old club had come to provide a very major part of the glue holding what's left of our changing utility radio hobby together.

As we go to press, it seems as if the replacement, a Yahoo! group called the Utility DXers Forum (UDXF), has succeeded in maintaining the WUN dialogue. It's run by a couple of the same people, and the great majority of WUN members made the transition. In fact, people getting the group by e-mail won't see much of a difference at all.

Even so, it seemed like a good time to look at our pastime of utility radio DXing, and where we go with it from here. Therefore, we'll have a longer column and a shorter log for this month only.

❖ WUN is Dead, Long Live UDXF

DXing is a very old pastime. As with other slang terms such as "ham" and "73," no one is completely sure how the name got started. The commonly accepted explanation comes from wire telephony, where "DX" on a switchboard meant "Distant Exchange." It was adapted to radio as "Distant Transmitter," or just any reference to a long distance. This distance, of course, is often as much psychological as physical.

It's hard to imagine now, but until recently the organized end of the DX scene consisted mostly of many small, often specialized clubs with printed newsletters. As postage and print costs rose ever skyward, so did dues, causing membership to plummet.

The Internet arrived as a viable alternative right about the time many clubs were almost simultaneously throwing in the towel. SPEEDX, the Society to Preserve the Engrossing Enjoyment of DXing, discontinued its newsletter. Radio Communication Monitoring Association, which specialized in scanner radios but took wide-ranging contributions from lots of people (including your editor and other *MT* writers), ran out of money and imploded. The situation looked pretty dire.

As a result, a group of experienced DXers corresponding by e-mail had the idea to try a real radio club, the WUN, but with electronic publication and funding through donations and CD sales. It seems like a no-brainer now, but this was the first attempt at a formal enterprise on a worldwide scale. Its success marked the beginning of a major transition in this hobby. It quickly came to have a very authoritative website and a lively mailing list with thousands of postings yearly.

WUN, however, really was a radio club, with all the work involved in running any non-profit organization. As always, a handful of very dedicated members did nearly all of the work. This was fine for ten and a half years, but nearly everyone moved on in their lives at once. With staff down to nothing and a big paperwork deadline coming up, it was clearly time to end the best online radio club ever.

Fortunately, the new UDXF seems to be working out. If anything, the e-mail traffic has increased, with 700 messages in two weeks. The list retains the tight focus and broad range of technical capabilities that made WUN the best place to ask newbie questions, share the latest DX triumph, or figure out how to extract intelligence from the latest swarm of funny digital noises.

The files section is growing slowly but surely. The log is continuing. The less dated files are slowly coming back, as copyrights are cleared with the original authors. *Monitoring Times* has received permission to post a few files on its website also. For example, Mark Cleary, a regular log contributor, has added a new list of US Coast Guard assets. Another one, Jeff Haverlah, has given permission to use his old WUN files explaining certain US military traffic.

As with all Yahoo! groups, UDXF can be joined with an e-mail to *udxf-subscribe@yahoogroups.com*, using a subject line consisting solely of the word "subscribe." Those with Yahoo! accounts or wishing to start one, can access the group's postings and its files section via the World Wide Web, at **http://groups.yahoo.com/group/udxf/** If you start a Yahoo! account and don't want an avalanche of unsolicited e-mail, don't forget to scroll down to the "marketing" link, and uncheck all the boxes on the resulting page.

❖ Where's This Hobby Going?

Utility radio fans are something of a pessimistic bunch. Everyone's heard so many stations leave the air and read so many dark prophecies about the end of shortwave, that gloom and doom are everywhere. If this is true, though, then why did UDXF pass over 700 messages in its first two weeks?

What seems more likely is that the hobby is in another transition. Like everything else, it seems to be getting a lot more digital. Between copying utes at the computer, logging at the computer, writing at the computer, and making graphic art at the computer (sometimes all at the same time), I start to feel like one of those early hackers who never left the university lab. At least I don't get pizza on the keys.

There are certainly a lot fewer instantaneous, obvious targets on shortwave. A quick run across the dial used to produce a cacophony of loud signals. Now, there are a few big ones, a few weak ones, and a few completely empty spaces.

Many of the easy hits vanished in the 1990s, as the maritime service and the last of the old point-to-point circuits moved most traffic to satellites. It was no longer possible to turn on a radio, twist a knob, and instantly hit upon a huge signal with hours of passengers on romantic cruise ships paying $25 a minute to tell their relatives back home that the phone call was costing them $25 a minute.

The news often wasn't much better elsewhere, with stations seemingly leaving the air in droves. They all lost funding because people thought shortwave was dead. People thought shortwave was dead because, after all, look at all the stations losing their funding. There was also the somewhat more substantial fact that traffic was way, way down at a time when rapidly privatizing and consolidating telecom companies could no longer afford to run services at a loss.

At the start of this period, which is about when WUN started as well, beginners could master upper-sideband (USB) voice and continuous-wave (CW) Morse telegraphy, and keep pretty current with the activity. A $90 radio with a $10 wire antenna wasn't going to do anything spectacular, but at least it heard enough to keep kids awake well past bedtime any night of the week.

What we now call the "digital modes" were there, but DXing them was just getting started. People with a little extra knowledge and a lot of extra money had gotten into Baudot radio teletype (RTTY), or maybe even Simplex Telex Over Radio

(SITOR, and its amateur version, AMTOR). These modes finally became practical: Slick-looking, digital decoding boxes had replaced the fearsome, room-filling banks of mechanical gear. These digital units were much more expensive, but they didn't take over your living space, and there was no more having to explain that the hot-oil smell was completely normal.

What really changed listening, though, was the subsequent move to sound-card-based decoding software running on standard personal computers. One no longer needed any extra equipment more complicated than a $4 audio cable, or at most a small interface plug. On the transmit side, roughly similar technology has filled the bands with ever-multiplying classes of modulation waveforms making ever-stranger noises. Computer concepts like Fast Fourier Transforms and Digital Signal Processing rapidly entered into the already somewhat esoteric radio jargon, rendering many conversations unintelligible to outsiders.

On the receiving side, the result is a far longer learning curve. In fact, the learning process really never ends, because it is more like an effort to keep up. That's become something of the challenge of this hobby.

But, when you look at the objective reality, utility listening is not really any better or worse than before. It's just different.

Back in the "good old days," nobody had to bother with computers unless they absolutely wanted to. Now, however, they don't have to learn the Morse code unless they absolutely want to. Back then, no one had Broadband over Power Lines or computer interference buzzing in their ears, but they had the Russian Woodpecker banging away 24/7. Back then, one could tune in phone calls, but honestly, weren't these alternately boring and depressing? I mean, I gave them up the day I got home from my grandmother's funeral. Wanting to space out with a little simple listening, I snapped on the already ancient Hallicrafters SX-62, only to have the first words out of the giant speaker upon tube warm-up be a kid sobbing, "Pop died!"

Click, went the switch.

And so, as WUN comes to an end, we see a hobby that is not at all dead, but merely changing, again, to keep up with technology. Yes, the signals are weaker, but the equipment is better. And, those who tune around will eventually hear that shortwave is still full of stations from one end to the other, just not all at the same time.

❖ Call for Utility Logs

The subhead says it all – this column needs your logs! It doesn't matter how simple they are. Don't be afraid. The logs are not about "Great Moments in DX." They're about what normal people all over the world are hearing, so others can hear it, too. Believe it or not, the whole point is to get everyone's logs in: We worry about whether or not it's a good catch somewhere farther down the list of priorities, if at all.

If you're a beginner or occasional listener and you hear what would be an easy target for an ace, it doesn't matter. Send it in. Everyone started at one time or another, and besides, you might have an ace catch and not even know it.

The logs are in a format perfected by Larry Van Horn, the former editor. There was no point in messing with success. The main difference from the typical utility shorthand we all scribble at home is that they're in plain ordinary English, even though at first they might not look like it. This makes them a little more readable, so hopefully people will be a little less intimidated.

Notice that dates aren't given, so you can get away without one, though they're still nice for us to have for other reasons. However, there is an absolute need for a time of intercept, and it should be in Coordinated Universal Time (UTC). This has to be a hard and fast rule, at least until the Earth stops being round. Also, frequencies should be in kilohertz (kHz), not megahertz (MHz).

Finally, we need your name, though if you absolutely insist, a first name or handle has been allowed in the publication. Also include the place of intercept – once again because of the spherical shape of this planet. A country is fine except in the US and Canada, where we like to have a state or province.

Don't worry about length. They get edited anyway. If you have a couple, send 'em. If you have enough for the next frequency book, send 'em.

The best way to send them is to this column's e-mail address, *utilityworld@ominous-valve.com*. (OK, it's the name of an old vacuum-tube recording studio, before that kind of thing was in vogue.) They can also be sent to my editorial e-mail address or snail-mailed to our column P.O. Box, both of which are listed up at the top.

Happy logging until next month.

UTILITY WORLD

UTILITY LOGS

Hugh Stegman

ABBREVIATIONS USED IN THIS COLUMN

ALE ..... Automatic Link Establishment
AM ..... Amplitude Modulation
ARQ ..... Automatic Repeat Request teleprinting system
AWACS ..... Airborne Warning And Control System
CAMSLANT .. Communication Area Master Station, Atlantic
CAMSPAC .... Communication Area Master Station, Pacific
DSC ..... Digital Selective Calling
DTRE ..... French Acronym: Foreign Research Telecom Director
E10a ..... Israeli English phonetic "numbers" variants
EAM ..... Emergency Action Message
FAX ..... Radiofacsimile
FEC ..... Forward Error Correction teleprinting system
FSK ..... Frequency-Shift Keying
HFDL ..... High-Frequency Data Link
HF-GCS ..... High-Frequency Global Communications System
MARS ..... US Military Affiliate Radio System
Meteo ..... Meteorological
MFA ..... Ministry of Foreign Affairs
RCC ..... Rescue Coordination Center
RTTY ..... Radio Teletype
SITOR-A ..... Simplex Teleprinting Over Radio, ARQ mode
SITOR-B ..... Simplex Teleprinting Over Radio, FEC mode
UK ..... United Kingdom
US ..... United States
USCG ..... US Coast Guard
V2a ..... Cuban Spanish "Atencion," 3-message variant
VOLMET ..... Airport observations (from French "Flying Weather")
XSL ..... Japanese data or telemetry, sounds like broken slot machine

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 ().

129.1 DCF49-European power company load control, Mainflingen, Germany, FSK data at 0823. (Ary Boender-Netherlands)

139.0 DCF39-European power control, Burg, Germany, FSK data at 0823. (Boender-Netherlands)

518.0 ZSC-Cape Town Radio, RSA, SITOR-B Navtex at 1240. (Bob Hall-RSA)

2598.0 Labrador Coast Guard Radio-Canadian Coast Guard, weather at 0445. (Tom Sevart-KS)

2899.0 Gander-North Atlantic air route control, Canada, working Delta 64 at 0454. (Sevart-KS)

3270.0 MIW-Abnormal Israeli Intelligence (E10a) callup MIW A46 Z2215 B65 Z2100, simulcasting on 5230, at 1850. (Boender-Netherlands) *[Spaces have been inserted for formatting. -Hugh]*

3485.0 New York-VOLMET with weather for Midwestern US, at 0136. (Jeff Seale-KY)

4149.0 WCX9104-Tug *Monitor*, weather info for unknown station on "Channel 452," at 0514. (Sevart-KS)

4317.9 NMG-USCG, New Orleans, LA, weather FAX charts all stopping partway through, at 0038. (Seale-KY)

4739.0 Red Talon 711-US Navy P-3C, on-station report to Fiddle (US Navy, Jacksonville, FL), at 1145. (Mark Cleary-SC)

5095.0 CFH-Canadian Forces, Halifax, NS, RTTY loop at 0225. (Seale-KY)

5339.0 KPA-Abnormal Israeli Intelligence (E10a) callup KPA A1930 Z2200 Z99 B1945 Z2215 Z98, at 1849. (Boender-Netherlands)

5550.0 New York-North Atlantic air route control, working Condor 189 at 0230. (Seale-KY)

5680.0 Rescue 51-Probably British Coast Guard, working Kinloss Rescue on a search, at 0738. (Patrice Privat-France) Navy 193-UK Royal Navy, same search, working Kinloss Rescue at 0854. (Boender-Netherlands)

6330.0 LZW-Varna Radio, Bulgaria, SITOR-B tariff and frequency schedule, at 0308. (Ed Pusey-VA)

6754.0 Trenton Military-Canadian Forces VOLMET, Ontario, aviation weather at 0639. (Sevart-KS)

6760.0 "9-R-T"-French Air Force, working ground station Papa India and aircraft "5-L-E," at 0653. (Privat-France)

6761.0 Grits 20-US Air Force C-17A, air refueling with tanker Top Cat 03, at 2225. (Cleary-SC)

6768.0 Cuban Spanish female AM "numbers" (V2a), 5-figure groups at 0430. (Sevart-KS)

6855.0 Cuban AM "numbers" (V2a), callup 65663 25883 95443, at 2101. (Cam Castillo-Panama)

7887.0 Cuban AM "numbers" (V2a), callup 65663 25883 95443, at 2000. (Castillo-Panama)

7975.0 Cuban AM "numbers" (V2a), 5-figure groups at 1621. (Sevart-KS)

8010.0 Cuban AM "numbers" (V2a), 5-figure groups, transmitter cutting abruptly in and out, at 0606. (Sevart-KS) V2a, callup 75973 18813 86703, at 1700. (Castillo-Panama)

8097.0 Cuban AM "numbers" (V2a), callup 01083 07003 70303, at 1800 and 1900. (Castillo-Panama)

8313.0 "The Slot Machine"-Bleepy Japanese data idler (XSL), also on 8703.5, at 0753. (Sevart-KS)

8414.5 2ERB-Lifeboat17-08, calling Lyngby RCC, Aarhus, Denmark, in DSC at 0830. (Boender-Netherlands)

8416.5 NMF-USCG Boston, reporting reception of a distress signal from vessel *Marilyn McCall*, SITOR-B at 0212. (Seale-KY)

8682.0 NMC-USCG CAMSPAC, CA, FAX weather chart at 0210. (Seale-KY)

8906.0 New York-North Atlantic air route control, working American flight 68 at 0157. (Seale-KY)

8912.0 VS0006-Virgin Atlantic flight 6, HFDL position for station 04, Riverhead, NY, at 0149. (Seale-KY)

8971.0 Fighting Tiger 21-US Navy P-3C, passing a Spare Group report to Goldenhawk (USN, Brunswick, ME) at 1806. (Cleary-SC)

8983.0 CAMSLANT-USCG, passing a vessel-sighted report from Sector San Juan to helicopter Coast Guard 2114, at 2143. (Cleary-SC)

8992.0 Matlock 4-US military, radio check with Andrews HF-GCS, at 1353. (Jeff Haverlah-TX)

9001.6 Sector Miami-USCG, calling Shark 13, Coast Guard asset on a drug operation, at 2350. (Cleary-SC)

9007.0 Trenton Military-Canadian Forces, calling Sentry 50 (US Air Force E-3 AWACS), at 1631. (Cleary-SC)

9025.0 Sentry 50-US Air Force AWACS, patch via Andrews HF-GCS (MD) to Raymond 24 (Tinker Air Force Base, OK), at 2053. (Cleary-SC)

9153.0 Cuban AM "numbers" (V2a), 5-figure groups at 0705. (Sevart-KS)

10115.0 Unid-Possible Chilean or Venezuelan military shore station, working two vessels in a drug interdiction, at 0135, (Castillo-Panama) *[Amateur band, but probably a legal pre-existing allocation. -Hugh]*

11175.0 Andrews-Andrews HF-GCS, MD, with a 59-character EAM (first of 5 EAMs in a half hour), at 1443. (Haverlah-TX) Mad Fox 04-US Navy P-3C, patch via Offutt HF-GCS (NE) to Naval Air Station Jacksonville, FL, at 1524. Diego Garcia HF-GCS, working WB774, a US Navy P-3, at 2043. (Cleary-SC)

11232.0 Atlas 10-Canadian CC-130, patch to Trenton Military, to get a message from RCC, at 1849. (Cleary-SC)

11253.0 UK Royal Air Force, Brampton, with VOLMET aviation weather at 0204. (Pusey-VA)

11421.7 FJY5-French DTRE, Crozet Archipelago, Antarctica, ARQ idler at 1530. (Hall-RSA)

12170.0 ABUJA-French Diplomatic, Nigeria, calling BALTAZAR in ALE, at 2254. (Privat-France)

12579.0 NRV-USCG, Guam, SITOR-B weather at 1540. (Hall-RSA)

12789.9 NMG-US Coast Guard, New Orleans, LA, FAX weather charts at 1828. (Sevart-KS)

13597.0 JMH4-Tokyo Meteo, Japan, FAX satellite image at 0714. (Hall-RSA)

13927.1 King 84-US Air Force HC-130, patch via Air Force MARS station AFA3HS (KS) to Meteo at 1848. (Cleary-SC) Reach 9015-NY Air National Guard C-5 diverting with unretracted landing gear, MARS patch at 2045. (Allan Stern-FL)

16260.0 RFGW-French MFA, Paris, FEC number groups at 0720. (Hall-RSA)

16906.5 FUV-French Navy, Djibouti, RTTY test loop at 1557. (Hall-RSA)

16971.5 JJC-Tokyo Radio, Japan, 60 line per minute Kyodo News FAX at 1520. (Hall-RSA)

17146.7 CBV-Playa Ancha Radio, Valparaiso, Chile, weather FAX at 1245. (Hall-RSA)

17967.0 BMM201-Atlas Blue flight, sending HFDL position for station 15, Bahrain, at 0908. (Privat-France)

22542.0 JJC-Tokyo Radio, 60 line per minute Kyodo FAX at 0710. (Hall-RSA)

Mike Chace
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HF Digital Users from France

This month's profile covers the various French organizations that can be heard on shortwave radio. But first...

❖ Welcome UDXF!

Some sad news about WUN, the Worldwide Utility News, an email group of many hundreds of HF utility listeners that has been keeping the community well informed for over a decade and has been mentioned in this column many times.

Quite by surprise, WUN ceased operation in April, citing lack of volunteer time able to keep the not-for-profit club running. This is a shame, and my thanks go to all of the folks involved in WUN over the years for their dedication to our particular side of the shortwave listening hobby and to QTH.Net who hosted the group for much of its existence.

However, all is not lost, and WUN has reformed in the guise of UDXF (Utility DXers Foundation) operating as a group on Yahoo. You can request to join the group by sending an email to "udxf-owner@yahoogroups.com" with just the word "subscribe" as subject. There is no charge for receiving the daily emails from the 700 or so ex-WUN members who have migrated to the new group.

❖ French Diplomatic Service

MFA Paris continues to make use of HF frequencies, but not to the extent that it once did. There is now only very rare use of the 192bd 400Hz shift FEC-A system that once connected embassies worldwide, but ALE triggered Thales Systeme-3000 modems can be widely heard.

MFA Paris uses the fictitious callsign "P6Z" when using the older FEC-A system with embassies using other letter-number-letter style callsigns. Messages destined for military attaches are sent using the callsign "RFGW." Most recent activity on this mode has been on the following channels:

14731.7, 16260 and 18757 kHz

The ALE network can be heard on the following frequencies:

6900, 7668, 7740, 7907, 9052, 10825, 12170, 13513, 14671, 15921, 16320, 17477, 18396, 19636, 20616, 25055 and 25301 kHz USB

Paris uses the identifiers CER11, 41 and 42 or BALTAZAR, while embassies use their location as callsign – for example, ABUDHABI, BEYROUTH, CONAKRY, etc. – making identification easy. For the most part, Systeme-3000 can be read with a standard STANAG4285 decoder.

❖ French Navy

A few months ago we noted that the French Navy had begun to shift a number of its regular RTTY channels to STANAG4285. However, many of the channels remain active with 75, 100 or 150bd Baudot RTTY at 850Hz shift:

2789, 6348, 6385, 8300, 8538, 12140, 12666.5, 12857, 13031.3, 13042.5, 16904.9, 16915, 17180 and 22537 kHz

Messages are scarce with a distinctive channel marker running most of the time:

ryryryryryryryryryryryryryryryryry
sgsgsgsgsgsgsgsgsgsgsgsgsgsgsgsg
faaa faaa faaa de de de 6ww 6ww 6ww
voyez le brick geant que j'examine pres du wharf
nnnn

Some French Navy frigates and ports have also been heard on using ALE on 10509.6, 11018 USB. Other voice activity has been reported on 5708 and 6760 kHz USB using callsigns "Armor" and "Whiskey Alfa."

❖ French Air Force

The French Air Force has also been a long-standing fixture on a number of frequencies using both CW and Baudot RTTY, usually with 50bd and 400Hz shift. Like their Naval counterparts, these stations mostly run markers.

On CW the markers are usually of the form "vvv vvv vvv de fdg fdg fdg ar" but RTTY markers are most often like those used by the Navy.

Here are some frequencies to check:

3142, 3300.5, 3341.5, 3814, 4042, 4557, 5090.5, 5110, 5123.5, 5202, 5257.5, 5292.5, 5437, 5446, 5701.5, 6838, 6840, 6971.5, 7663, 7788, 7859, 8070, 9348, 10166.5, 10470.5, 10520, 10607, 10835, 12312.5, 13870, 14661, 16333.2, 16347.5, 18012, 19084, 20115 and 20705 kHz

The stations usually heard are:

FDC	Metz
FDG	Bordeax
FDI8	Nice
FDI14	Contrexville
FDI22	Narbonne
FDY	Orleans

The long-standing "(operated by the Air Force can be heard on the following channels:

6688, 6712, 8972, 8992, 13236, 14587, 18012 and 23254 kHz

❖ French Army

The HF stations of the French Forces, located in various ex-colonies, aren't as prevalent as they once were, but can still be heard on a variety of frequencies. These stations are now the sole users of the once frequent ARQ-E and ARQ-E3 systems. With 400Hz shift, these signals can be heard with speeds from 48bd to 200bd. The ARQ-M2 and M4 transmissions haven't been heard for some time now; however, just about any decoder program will receive these modes.

Most messages are sent in the clear, with callsigns beginning RFF followed by one, two or three letters. However, careful examination of messages is required when listening to these stations, as the real sender is identified through the routing indicators used in the message headers which begin with ZCZC.

Here are some recently monitored frequencies to try:

6955, 6981.2, 7895.7, 8105, 11098.2, 13572.5, 13593.7, 13846.7, 13986.7, 14585.7, 14731.7, 16014.2, 16165.2, 16305.7 and 19673.2 kHz

❖ A Word about IRC

The new Utility DXers Foundation delivers messages quickly via email. But for some real-time action, check out Internet Relay Chat (IRC). IRC provides a forum where groups can chat together using simple software available for just about every platform possible from Mac OS X and Windows to Palms and Pocket PCs.

To use IRC requires logging into a server, and from there joining a particular group, but in most cases using the servers is free. In the case of our hobby, try logging into the servers at **irc.zirc.org** and joining the group #wunclub. You'll be joined with a group of about 30-50 monitors who are exchanging all kinds of frequencies and chatter on shortwave and digital listening.

You can learn more about IRC at **www.irchelp.org** or on the *Monitoring Times* website at **/html/mtbaudwalking.pdf**

That's all for this month, see you next time.

GLOBAL FORUM

THE WORLD OF SHORTWAVE BROADCASTING

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Relay Exchanges Between Greece and USA Abruptly Terminate

We knew it was coming (see our May column), but not so soon. John Babbis, who from Maryland monitored V. of Greece daily, heard nothing from the usual Delano relay 9775 at 1200 April 26, nor on 17705 after 1600. It was soon confirmed that those relays had come to an end (as well as via Greenville at 20-22 on 17565). From Greece itself, the Kavala site, used by both VOG and VOA, continued for the time being, with VOA and other IBB services quickly moved to other transmitter sites in Germany, UAE, Sri Lanka, many remaining on the same frequency, so the change would not be obvious to the casual listener. The question was whether Kavala would be totally closed, or turned over to the Greeks for their own continued use.

Babis Charalampopoulos, ERA, explained to John Babbis that a 10- year agreement between ERA and VOA had expired, so the frequencies from Delano and Greenville were cancelled, but Kavala remained working temporarily.

Then IBB notified that all transmissions from Kavala and Rhodes, MW and SW had ceased as of 0900 UT May 11. V. of Greece thus reverts to reliance on its other site, Avlis; for example, on 9420 at 00-04 to North America, 15630 in our mornings, including *Hellenes Around the World,* in English, Saturdays at 14-15, as usual subject to sports pre-emption.

John Babbis reminds us that in 1987, before VOG got to use Kavala, Delano, and Greenville, they had morning broadcasts to North America at 1200-1250 and 1500-1550 on Avlis 15630, including English news segments on the half hour, now long gone.

ANTARCTICA LRA-36, 15476, did not meet its April 17 target date mentioned last month, but began to be sporadically heard a sesquiweek later, first reported April 28:

I heard reactivated LRA36 R. Nacional Arcángel San Gabriel in AM+USB On 15476 at 1915 UT with ID and frequency announcement (Stuart Austin, at a caravan site in England, *DX LISTENING DIGEST*) Extremely weak, but definitely a signal on 15476 at 1905-2120 May 3 and also a very weak signal the next day at 1940-2110, but no audio (Steve Lare, MI, *WORLD OF RADIO*) Also heard were unidentified signals earlier in the day between 1340 and 1610 on 15476-15477 USB or AM, QRM after 1600 from Gabon (Denis Gillet, Paraná, *DXLD*) Supposed to operate at 18-21 M-F, but Gabon blocks until 19 (gh) They were still waiting for parts to repair their 10 kW unit, so this was a 1 kW standby also used for 2-way communications with Buenos Aires (Gabriel Iván Barrera, via Manuel Méndez, *DXLD*)

ARGENTINA Radio Continental, Buenos Aires on 11131-LSB, ID, temp, exact time at 0847, strong, excellent (Adán Mur, Ñemby, Paraguay, *Conexión Digital*) Also heard in the evening with exhaustive discussion of the clitoris, much better than 15820 in the daytime (Raúl Saavedra, Costa Rica, *DXLD*)

BANGLADESH While in Andaman Islands mid-April I found Bangladesh Betaar home service in Bengali on new 7250, another day on 7315 around 0730-0815, also two weeks later at 1600 on 4750, testing reactivated transmitter (Jose Jacob, India, *DXLD*) Also 4750 with ID at 1700, CPBS China QRM (Hiroshi Tokusa, Japan, *ibid.*) And at 0125 (Alokesh Gupta, West Bengal, *ibid.*) 4750 opens around 0000, closes 1730; another day at 0000 on 4880, blocked from 0020 by AIR Lucknow (Jacob, *ibid.*) 4880 was one of their old inactive frequencies (gh) Called up BB and spoke to Mr. M. C. Roy, Senior Engineer at Research & Receiving Centre. They were testing 4750 for three days in May, then 4880 for another three days. Reports wanted to rrc@dhaka.net (Alokesh Gupta, W. Bengal, *ibid.*) In the unlikely event news about this ever appears on their own website, check **http://www.betar.org.bd/** (gh)

BOLIVIA R. Illimani had been inactive but heard again, very weakly, on 6025 in mid-April, at least when there was football, until completely blocked by China via Albania from 2358. Another day with more football audible from 2300 when major stations leave the frequency. I contacted the station and its new director, Arturo Cruz, who says they have been remodeling, including a new webpage, actually linked from the Agencia Boliviana de Información (Manuel Méndez, Spain, *DXLD*) **http://www.comunica.gov.bo/index.php?i=illimani** including auto launch of a jingle ID (gh) Tentatively this until 0259* with football more likely than R. Amanecer, DR (Ron Howard, CA, *ibid.*)

Radio Santa Cruz, Santa Cruz de la Sierra, 6134.8, audible after R. República via UK closes at 0000, as R. Aparecida, Brasil, does not bother much, with grammar lessons, ID, 0008 sports news, football games, ads. This is the best verifier in Bolivia, if you send return postage. I quickly got a friendly reply by e-mail from Javier Velasco, *irfacruz@entelnet.bo* who was pleased to be heard so far away. The 0000 program is *El Maestro en Casa*, adult education, with 15,000 students, groups of whom also meet in person once a week (Manuel Méndez, Spain, *DXLD*) Similar reply from them says this show teaches eight primary courses with textbooks provided, but they don't have a QSL card (Ignacio Sotomayor, Spain, *ibid.*)

BRAZIL R. Guaíba, Porto Alegre RS, heard on 11785 with its own news after A Voz do Brasil; need USB to avoid R. Nacional Amazonia on 11780 (Carlos Gonçalves, Portugal, *DXLD*) Reactivated with excellent audio, high quality traditional music, and news, but it's almost unlistenable here due to 11780 QRM and spurs (Luiz Chaine Neto, SP, *radioescutas*)

Joseny Luiz Gonçalves de Castro in Paraná is happy to report that R. Globo, Rio, has reactivated 11805, heard on an April evening with excellent reception, some 60 days after he wrote the station asking them to resume SW (Célio Romais, *radioescutas*) Hope they stay, the only Carioca on SW; have reactivated this many times only to disappear again (Luiz Chaine Neto, SP, *ibid.*) Also resumed 6030; Gilberto Kussler, transmission manager at Globo, told Edson Ferreira Gomes that 6030 is aimed at listeners in central/western Brazil. Perhaps he can also fix the spurs that 11805 is putting out on adjacent frequencies, gilberto.kussler@sgr.com.br (Célio Romais, *Panorama, @tividade DX*)

The other R. Globo, São Paulo, heard on 19170 = 2 x 9585, ID at 1835, fading (Adán Mur, Paraguay, *Conexión Digital*)

CENTRAL AMERICA This summer, Guatemala, Honduras, El Salvador and Nicaragua are observing DST of UT -5 instead of 6; starting and ending dates vary (timeanddate.com) With stations signing on an hour earlier in the morning as a result, some tropicals should be more DX-able (Elmer Escoto, Honduras, *DXLD*) Active only in Guatemala, Honduras (gh)

CHINA [non] More to last month's report on the clandestine Sound of Hope: besides the specific lower frequencies, continuous broadcasts from 22 to 16, sometimes until 18 UT, change at least twice a day among six frequencies in no discernible pattern: 17310, 17330, 17350, 18160, 18180, 18200, as monitored over eleven consecutive days, from Japan (S. Aoki, via NDXC HQ, S. Hasegawa) But to no avail as the jammer is following within minutes (Olle Alm, Sweden, *BCDX*)

Any listeners to SOH must be having a hard time finding it every day. For the government to spend so much time on chasing and jamming an outfit like that must show the sheer paranoia of the state to obliterate anything and everything that criticises them (Noel R. Green, UK, *ibid.*) Also via KWHR Hawaii, M-F 1400-1700 on 9930 (NDXC) Remember that over here, and perhaps in China too, you are more likely to hear the jammers than SOH itself, so be sure of the ID! (gh)

"Voice of China Reborn" in Chinese, via Taiwan, only 10 minutes; 0300-0310 on 9660, heavy QRM from China jam; 1400-1410 on 9780, QRMed by R. Free Asia (Nagoya DX Circle HQ, Japan) Rather counterproductive (gh)

Another clandestine, Ming Hui Radio, tentative on 11700, at 1535-1600, M&W talking, Chinese firedrake jamming throughout, also ending promptly at 1600. No ID heard thanks to both a migraine and booming and crashing of drums and cymbals. According to CRW this is a Falun Dafa effort (Mark Taylor, WI, *DXLD*)

CUBA RHC, 17705, concluding Arabic at 0032, strong and excellent (Adán Mur, Paraguay, *Conexión Digital*) Scheduled at 0000 in Quechua. Weak here; I also started monitoring and also heard it mostly in Arabic, but on occasion in Portuguese, and some Spanish. Seems RHC can't decide what language to broadcast here. It's rather late for Arabic to be heard in Afro-Asia. But B-05 schedule,

*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; A-06=summer season; [non] = Broadcast* to *or* for *the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated*

the latest available, shows Arabic only at 2030 on 11800, and for the Caribbean! (gh)

A royal mess between RHC Spanish on 15230, and CRI Spanish relay via Cuba on 15120 during the 00 UT hour. Both services could be heard on both frequencies, plus leapfrog mixtures on 15010 and 15340. Also RHC Spanish on 12280 at 0049, 2 x 6140, and a bubble jammer against nothing on 11990 (gh)

ECUADOR In keeping with reordered priorities, HCJB terminated its last English broadcast from Pifo May 6 at 1330* on 12005, a nostalgic occasion for many longtime listeners. *DX Partyline* continued via Australia, WWCR and WRMI, but from June would be halved to less than a quarter-hour per week. Meanwhile, antennas continued to be carefully dismantled at Pifo, for possible reconstruction elsewhere, while DRM tests proceeded with low power but high gain, and it was expected that English would continue to be available, but only in DRM until all the antennas are down by the end of 2007 (gh summarizing many reports, press releases and broadcasts)

EQUATORIAL GUINEA R. Africa 2, 15190, heard in late March at 1017 in English, religion (Adán Mur, Paraguay, *Conexión Digital*) Not reported for months, believed inactive; was scheduled M-F 07-11; Sat & Sun as R. East Africa at 0600-1630, per S. Aoki (gh) Preacher at 1000 heard under CRI, 1011 IDs; last confirmed in May 2005 (Dave Kenny, England, BDXC-UK *Communication*) In the clear 1100-1130 (Manuel Méndez, Spain, *DXLD* and Arnaldo Slaen, Argentina, *@tividade DX*) And as early as 0805 all in English (Manuel Méndez, Spain, *DXLD*) Signed off at 1154* after addresses in California, Uganda (Scott R. Barbour, NH, *ibid.*)

FINLAND English again from YLE! I hear a 3-minute summary including weather for Helsinki at 1255-1258* on 15400 and 13715, domestic service relay. Probably M-F only (Joe Hanlon, NJ, *WORLD OF RADIO*) I never could hear it despite several checks, stayed in Finnish (gh) YLE News is scheduled daily at 1255 on national program I (Mauno Ritola, Finland, *DXLD*) Also heard on its satellite feed, but English news cut off before it could start, so when it goes on SW it must be by mistake (Erik Køie, Denmark, *ibid.*) God forbid that a few words of English should go out on SW, contrary to YLE's isolationist policy (gh) 3-minute English news at 1255 not heard again until a month later, also on a Wednesday (Joe Hanlon, *WORLD OF RADIO*) BTW, *Nuntii Latini* is now scheduled Sunday 1050 on 11755 to Eu; 1353 on 15400 to NAm (gh)

FRANCE/GABON From current schedules it appears that R. France Internationale is no longer being relayed from here, leaving only R. Japan, Africa Number One, and the music jammer for Libya transmitted via Moyabi. Can anyone confirm? (Tony Rogers, UK, BDXC)

At 1855 I found Africa No. 1 on 19160 = 2 x 9580. Signal was very weak, but // 15475 (Juergen Lohuis, Germany, *harmonics yg*)

GHANA GBC Ghana, 4915, mid-April at 1947 ID with songs like *'Suddenly'* and *'Careless Whisper'* (Zacharias Liangas, Greece, *DXLD*) Had been inactive since Feb (gh) Also heard on 4914.75 from 1942 to 1952 in vernacular (Ignacio Sotomayor, Spain, *ibid.*)

No one, including myself, seemed to have logged Radio Ghana on 4915 for some months, so I made enquiries with friends at GBC, and they report: "Our transmitter for 4915 was off air for some time because some spare parts had to be changed. We now have the parts and they have been fixed. A test transmission is going on and all will return to normal very soon. Management is even contemplating buying a brand new transmitter and also another one with the view of resuming our External Service." (Chris Greenway, *DXLD*)

HUNGARY Most of the mail we receive asks about the situation of foreign language broadcasts at Hungarian Radio. Due to parliamentary elections, nothing has happened, and we don't know anything about our fate. Some mention the old saying, ''after the calm comes the storm.''

Something will happen after formation of a new government. But it will be with the same coalition as in the past eight years; they won the election, so we don't expect much. There will be an austerity program in all aspects of the Hungarian government.

The pessimistic tone in my voice reflects the majority of my colleagues, not just Spanish but the other languages, too. The sword of Damocles is hanging over our heads. Any news we have we will let you know on the air. We are proud to have so many friends all over the planet (Sergio Pérez, R. Budapest Spanish mailbag show via José Miguel Romero, *DXLD*)

INDIA AIR Chennai changed from 7275 to 7270 at 0025-0430; must be due to interference from Singapore which moved from 7170 to 7275. Chennai 100 kW on 7270 is also at 0700-1330, 1430-1740 (Jose Jacob, VU2JOS, *dx_india*)

Some report poor results in QSLing AIR, but I have positive results by e-mail. It helps to use the Hindu greeting in the subject line, ''Namaste," and express some knowledge or interest in their city. Requests that reception reports be submitted on-line at **http://allindiaradio.gov.in/** or e-mail spectrum-manager@air.org.in (Ron Howard, CA, *DXLD*)

INDONESIA RRI Kendari QSYed from 4000 to 3995 on 15 April, heard at +1000-1300+, QRMed Nei Menggu PBS on 4000 (Nagoya DX Circle HQ, Japan)

RRI Manokwari first noted on 3987, May 3 at 1100. North Korea jam on 3985. Local news at 1000 and 1100 (Atsunori Ishida, NDXC via S. Hasegawa, *DXLD*) Had been inactive; *PWBR* shows 1000-1230, 1 kW (gh)

KOREA NORTH [non] Free North Korea Radio, 5880 at 1500-1600, QRT on 14 April (Shigenori Aoki, NDXC) But still heard at other times, April 26-27 1700-1733* on 9760, 1000-1027* on 11750. See **http://www.freenk.net/** (S. Hasegawa via Shigenori Aoki, NDXC, via *BCDX*) These are Merlin-brokered, scheduled for a full hour, via Taiwan. Also at 15-16 on 7470 via Tajikistan (Wolfgang Büschel, *ibid.*)

Shiokaze, 5890, was jammed with dirty carrier and 967 Hz single tone at 14-15 UT 5 May. Probably the first jamming since launched on 31 Oct. 2005 (Mituhiro Hukunaga, Kyushu, *dxing.info*) That service enumerating Japanese abducted by North Korea (gh)

KURDISTAN [non?] Voice of Free Kurdistan was heard at 0250-0350 on 4675 in Kurdish. Radio Voice of Strugglers of Iranian Kurdistan is back on SW, heard at 0245-0345 drifting 4400-4415 in Kurdish (Rumen Pankov, R. Bulgaria DX via John Norfolk)

LIBYA [and non] In mid-April, Libya began a new strategy against opposition station Saut Al-Amel, at 12-14 on frequencies constantly changing between 17660 and 17690. Two frequencies became occupied by V. of Africa services, via France, in Hausa, English, French and Arabic; two with music, one of them apparently via Gabon; and two more with noise jamming, one pulsing, the other sounding like a hacksaw, perhaps from Libya. In order to block SAA, the noise jamming could also interfere with V. of Africa itself (José Miguel Romero, Spain, *DXLD*)

V. of Africa also had a Swahili service via France on 17610 at 12-1357, moving to 17725 from May 7; English at 14-1557 also moved from 21695 to 17725, and stayed on 17850 (*DX Mix News*, Bulgaria) Earlier in May, the Libyan music channel which had stayed on 17660 swapped with other services on 17680. One of the V. of Africa Arabic transmitters produced leapfrog spurs with Swahili on 17610, both transmitters obviously in France.

Two days later, SAA opened on 17665 at 1200, the first time under 17670. V of Africa in Arabic stayed on 17660 and 17670 until 1400 as did the music channel via Moldova on 17680. The sensational new event was that RFI French sometime between 1205 and 1220 changed from 17620 to 17665, where they stayed to at least 1400, so the French are becoming even more involved in these dirty activities. Money may not smell, but sometimes it does stink (Olle Alm, Sweden, *DXLD*)

On May 5, Sout Alamel signed on 17670 abruptly at 1200 with a new, unique ID, *Sout Libya dar al-idhaat al Libya fil Mahjar* (Voice of Libya, the Libyan radio in exile) and again at 1235 (Tarek Zeidan, Egypt, *ibid.*)

LUXEMBOURG [and non] Broadcasting Center Europe registered for A06 two RTL daytime programs in English and French in analog mode but nothing heard as of early May: English 300 degrees 04-08 6035, 08-10 5925, 10-18 6035; French 220 degrees, 04-06 5945, 06-08 6055, 08-15 5935, all 10 kW from Junglinster site in Lux (Udo Krueger, Germany, *BCDX*) Also 24h DRM in English, 1 kW on 25795 (Wolfgang Büschel, *ibid.*)

MALAYSIA On 7295 the Traxx FM program of RTM in English, is often heard at times between 1039 and 1500, including Saturdays 1240-1400, *Traxx Chart Toppers*, playing the top 20 songs (Ron Howard, CA, *DXLD*) Audible here between 1016 and 1102, but heavy ham SSB QRM except on a Sunday. In winter, 7295 had nothing but DRM hash (Scott R. Barbour, NH, *DXLD*) That would have been Germany even at local noon (gh)

MALI R. Mali, Kati reactivated in late April on 4834.9 at 2125-2146, vernacular, Malian songs, interview; extremely weak audio // 5995. Surely the same transmitter also back on 7286.4 at 0940, 1220 (Carlos Gonçalves, Portugal, *DXLD*) Had been off 4835 since Nov 2004 (Anker Petersen, DSWCI) ORTM with usual *Saturday News Magazine* in English at 1910 on weakish 4834.85 (Jari Savolainen, Finland, *DXLD*)

MÉXICO Update on SW here as of late April:

2390, Radio Huayacocotla, heard well in Cuernavaca and occasionally in Mexico City.

4810, XERTA, occasionally hear noise on frequency; hard to keep up with their antenna location due to frequent moves.

6000, Radio Insurgente, Zapatista clandestine, heard almost every Friday from before 2000 until 2050, a UT hour earlier for DST.

6010, XEOI, Radio Mil, the most reliable station, 24 hours, but at night still has heavy interference from Colombia.

6045, XEXQ, Radio Universidad SLP is making a major effort to be on the air, often on for a few hours and then disappears; has a lot of problems with their ancient transmitter. When on, heard well enough.

6120, XETS, Tapachula, is still authorized, but not heard and there is no concrete information from them.

6185, R. Educación, continues at night, 23-11 UT, but with major interference at certain hours.

9600, Radio UNAM, still not reactivated; maybe a bureaucratic problem as the last I heard from Ing. Mejía, all that remained to do was install some high-voltage cables (Julián Santiago Díez de Bonilla, DF, *DXLD*)

NETHERLANDS ANTILLES RN's webpage in Dutch reports on renovation of the Bonaire relay (Guido Schotmans, Belgium, BDXC) New transmitters are part of the package. The original two Philips are almost 40 years old, and DRM will be part of the new capability. Four million Euros have been budgeted for the project. Mentions staff reduction, which seems to indicate a high degree of automation after the rebuild is complete. Also there will be heavy emphasis on use of local suppliers in the area. The contract for the new transmitters was up for bids, so no technical info on that yet (Stephen Luce, TX, *DXLD*)

NEW ZEALAND Surprised to hear *Mailbox* at an unscheduled time from

RNZI, UT Fri 2030 on 15720 (Glenn Hauser, OK) A new repeat (Adrian Sainsbury, RNZI) Competing head-to-head with *WOR* on WWCR 15825. As of mid-May, regular DRM broadcasts still had not begun, but there were tests interrupting the analog schedule, which frequently changed. Check **http://www.rnzi.com** for whatever is current (gh)

PAKISTAN Director General of R. Pakistan, Tariq Imam, has revealed that the station is planning 100% national coverage, including replacing four shortwave transmitters (*Online International News Network* via *Media Network* blog)

PHILIPPINES Several DXers in Japan report that PBS has come back on 6169.8 after long long absence; seems to relay DZRB, Radyo ng Bayan on 738 but heavy QRM. Mainly heard around 0900-1200 (Kenji Takasaki in Mie prefecture, Japan, *HCDX*)

RUSSIA New 9765 for Radiostantsiya Tikhy Okean is much better than ex-5960; the only Russian signal I can get at 0835 on 31 m, sometimes rivaling Australia on 9580 (Raúl Saavedra, Costa Rica, *DXLD*) And adds 12065 as well (Vladimir Rozhkov, Kansk, *Rus-DX*) Hear both at *0835-0900 with news, interviews, ballads, but 12065 considerably weaker (Ron Howard, CA, *DXLD*) Correction to last month: URL of unofficial site is **http://oceandx.narod.ru** without the underscore before dx (Dmitry Mezin, Russia, *BCDX*)

SAUDI ARABIA At 1300 on 21640, *Idh´aa as´Saah*, which means the station of truth; phone calls about programming preferences, excellent (Adán Mur, Paraguay, *Conexión Digital*) No such name mentioned in *WRTH* for the General Arabic service; really a program name, or change? (gh)

SCOTLAND [non] R. Six International is launching a new DX program on May 13, *DXTRA.* There is a demand for a special program devoted not just to listeners' letters but also to news and views from the radio hobbyists' world. *DXTRA* will be broadcast several times each month, and we hope listeners will let us know what their views are on the current state of affairs on the HF and MF bands. E-mail letters@radiosix.com Initial broadcast was Sat 0920 on 13840, Sun 0750 on 13840, Thu 1950 on 5775 and via **http://www.radiosix.com** (Tony Currie, *DXLD*) IRRS via BULGARIA; then mid-monthly? Try July 15-16-20 (gh)

SINGAPORE OLI 96.8 FM in mid-April moved SW relay from 7170 to 7275 and also introduced podcasting via **http://www.oli.sg** (Raja Raja, India, *DXLD*) Because Singapore is leaving the 7100-7200 kHz block for amateur radio. Hams already have permission to use this segment except 7145, 7170 (Victor Goonetilleke, Sri Lanka, *ibid*.)

[non] New Asian AWR DX program, *Wavescan,* is now relayed to Americas via WRMI: Sat 0530, Sun 0630, Tue 0430 on 9955; Sat & Sun 1500 on 7385 (Dr. Adrian M. Peterson, *DXLD*)

SOMALIA [non] R. Mustaqbal again on SW from April 10: 0600-0815 on 15515 via UAE, 250 kW, 240 degrees in Somali Mon-Thu & Sat but strong co-channel Radio Australia in English (*DX Mix News*, Bulgaria)

SRI LANKA SLBC sign-on in English at 0100 on 6005 9770 & 15745, half an hour later than before (Jose Jacob, India, *DXLD*) Because SL shifted back to IST = UT +5:30 instead of +6 (gh) 11905 opens at *0018, Hindi, clear and very good (Terry L Krueger, FL, *WORLD OF RADIO*)

SUDAN [non] Darfur Salaam, the humanitarian radio program in Arabic, changed and expanded schedule to: 0500-0516 on 9735 and 11820, and 1700-1716 on 15515 and 17585 (Michael L. Ford, UK, DSWCI *DX Window*) via Cyprus, clandestine (Anker Petersen, *ibid*.) Does not fit any definition of clandestine. I am quite proud that the UK is involved in this work. Do not ignore the definition of Target Broadcasters in the *WRTH* (Mike Barraclough, UK, *DXLD*)

Sudan Radio Service, via UK sites, M-F 03-05 11805, 05-06 15325, 15-18 17660, but from May 8 tested 9735 at 03, 9695 at 04, 11940 at 05 (*DX Mix News*, Bulgaria)

TANNU TUVA R. Rossii is still relayed via Kyzyl on 6100, nominally 1 kW, but usually reduced to 0.25 to 0.5 kW. Best reception in Tomsk is during daytime, weak but clear. Local broadcast also was heard until 1100 (Vladimir Kovalenko, Russia, *open_dx* via *Signal*) Thus remotely possible in WNAm (gh)

TIBET [non] A-06 Voice of Tibet: 1055-1355 & 1430-1518, nominal 17550 via Dushanbe, Tajikistan, 100 kW, 131 degrees in Tibetan & Chinese but varying in 17525-17570 range, all jammed by China. Also 1400-1428 & 1530-1558 on 17550 via Madagascar, 250 kW, 045 degrees in Tibetan, ex 17505 (*DX Mix News*, Bulgaria)

TURKEY V. of Turkey, English at 0300 to NAm on 6140, has severe co-channel in Spanish from RHC (George Poppin, CA, to Sedef Somaltin, TRT) They do not coördinate. So we are moving to 5975 (Sedef Somaltin, TRT, via Poppin, *DXLD*) Poor but audible with adjacent QRM, nothing on same frequency; last season BBC via Delano was there with big signal. TRT ought to arrange such a relay now, especially with Greece deal over (gh) TRT is considering relay stations for HF broadcasting (Sedef Somaltin, TRT, *DXLD*) Also changed English at 1230 from 15225 to 15450 (*DX Mix News*, Bulgaria) Depending on propagation, 15450 can be good here, including *Live from Turkey*, Thursdays at 1250 (gh, OK) Very good signal at 2200 on 9830, and fidelity surprisingly good, with a feature on blue beads to ward off the "Evil Eye" (Ed Stone, NYC, *DXLD*)

U S A Five US Senators (Democrats) sent Bush a letter asking to stop the VOA cuts: Mikulski, Sarbanes, Durbin, Landrieu, Feingold: **http://www.afge1812.org/images/sen.jpg** and **http://www.afge1812.org/images/sen2.jpg** (via Mike Cooper, DXLD)

The global English-speaking community consists of the elites of virtually every country, as well as expatriates of the US and other countries, workers abroad, international students, Peace Corps and other volunteers, NGO employees, missionaries, seafarers, diplomats, military personnel and so on. This is perhaps the most influential audience in the world, and they make the effort to be well informed. This audience can't be served by VOA if the broadcaster does not have a global English service (Kim Andrew Elliott, *Radio World* via Mike Barraclough, Jilly Dybka, Mike Terry, *DXLD*)

VOA opened a new Studio Tour to the public April 17, developed in conjunction with the award-winning design firm of C&G Partners of New York, whose credits include the Ellis Island Immigration Museum and the D-Day Museum in New Orleans. VOA's newsroom, featuring TV and radio studios with live programming, serves as the central element of the visitors' experience, providing them with a behind-the-scenes glimpse of VOA operations. A special audio/visual production and visual displays illustrate VOA's history through its many milestones to the multimedia organization it is today. Reservations can be made online at **http://www.VOATour.com** (AIB *The Channel*) Which adds: the new VOA Studio Tour is now offered M-F at 12 noon and 3:00 pm [ET]. Or call (202) 203-4990.

Cuba is jamming VOA, not just R. Martí, because VOA has a program *Ventana a Cuba*, at 0100 on 11815, 9885 and 9560. Jamming quite heavy on 9885, off after 0130 when VOA goes to *Buenas Noches América*, revealing the fact that VOA is also interfering with itself during this hour, with English via Morocco also on 9885 (gh, OK)

WWCR has begun online streaming of all four of its SW services, via Windows Media, Real Media, and MP3 players: **http://www.wwcr.com/wwcr_listen.html** (WWCR)

For its in-band 25m channel, WWRB started out on 11920, then shifted to 11915, but later measured to within 10 Hz of 11918.0! So it's no accident. With Republic Broadcasting Network at 2153 pushing gold coins. WWRB previously used 12172 instead of assigned 12170. Apparently 11918 is to avoid Holy Qur'an Station, Sa'udi Arabia, on 11915 (gh, *WORLD OF RADIO*) At 1709 said you could listen to them anywhere from 11918 to 11920 (Harold Frodge, MI, *MARE Tipsheet*) Rechecked a few days later, at 1954, back on 11920.0 (gh)

New on WBCQ from mid-May: Sundays at 0500 on 7415, *Shortwave Overnights - Free Speech Rock and Roll*. Hosted by the Timtron, three hours of rock & roll plus open phone lines for listener comments on any topic, true free speech – no limits on content or language, patterned after my "free radio days" on my stations in New York. If this format for overnights on WBCQ is successful, and we find a sponsor to cover airtime costs, we will expand to more nights (Allan Weiner, WBCQ, *DXLD*)

Global Crisis Watch, the irregular podcast from Clandestine Radio Watch, has one airing on WRMI now, UT Tuesdays 0400 on 9955 preceding *Wavescan* at 0430 (via Jeff White)

[non] *Voice of Joy Music Hour*, a WRN shortwave client featuring Christian artists, adopted a new schedule for April through August, two Saturdays at 19 on 6220 to EU/ME/Af, July 8 & 15, August 5 & 12, alternating with two Saturdays at 13 on 15720 to As/Eu/Af, July 1, 22, 29, August 19 & 26. We can be reached on skype 2.0 contacting us via IP phone through voiceofjoy@comcast.net (Dean Phillips, *The Voice of Joy Music Hour,* via Tim Ayris, WRN) Not audible here on 15720 (gh, OK) But surprisingly good over East Asia and the Pacific; got a report from Craig in Perth, Australia (Ayris, WRN) Tyson

URUGUAY Cf June; One SW station was on the air and heard in mid-April, Emisora Ciudad de Montevideo, at 1755 on 9650, excellent signal with some kind of rodeio (Célio Romais, RGS, *Panorama, @tividade DX*)

VATICAN R. Vaticana, Spanish between 0100 and 0227 heard on 9610 ex-9605, presumably to avoid Habana on 9600; but also on 9610 for English at 0250, Spanish at 0320, colliding with BBC Swahili via Seychelles 0300-0330 already on 9610 (John Callarman, TX, *DXLD*)

ZIMBABWE [and non] SW Radio Africa was on SW 3230 at 03-05, later switching to 17-19, via South Africa, while the Lesotho 1197 MW transmitter was being repaired during March and April, and never jammed on SW thanks to lack of publicity; back to MW only from May (David Pringle-Wood, Zimbabwe, *DXLD*)

Meanwhile, news of the other clandestine radio, Voice of the People: trial of its board members was delayed again until 15 June. David Masunda, Nhlanhla Ngwenya, Lawrence Chibwe, Millie Phiri, Arnold Tsunga, Bella Matambanadzo and director John Masuku are accused of contravening section 7(1) of the Broadcasting Services Act which prohibits broadcasting without a license (Media Institute of Southern Africa via *Media Network* blog)

Radio Voice of the People has been awarded the 2006 One World Special Award for Community Media, presented in London on 8 June (*Zimbabwe Standard* via *Media Network* blog)

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

BROADCAST LOGS

NOTEWORTHY LOGS FROM OUR READERS

Gayle Van Horn, W4GVH
gaylevanhorn@monitoringtimes.com

0000 UTC on 6545
UKRAINE: Radio Ukraine International. *Ukraine Today* segment with topics on organization of Parliament, activities of Ukrainian Prime Minister and the upcoming national elections. Fair signal with fading. (Mike Branco, Islip, NY)

0020 UTC on 9530
BRAZIL: Radio Transmundial. Romantic ballads to identification and Portuguese information to station address at 0100. Station frequency quote into *La Palabra* religious program. Brazilians monitored: **Radio Cultural** 9615, 0110; **Radio Record** 9504.8, 2314. (Fernando Garcia, Baltimore, MD)

0100 UTC on 6200
CZECH REP: Radio Prague. Station ID into newscast and program preview // 7345. (Fraser, ME) 11600, 2137-2145+ with Czech news. (Harold Frodge, Midland, MI)

0215 UTC on 3340
HONDURAS: HRMI/Radio Misiones. Spanish. Rock/pop music program to station promotional and identification. **Radio Luz y Vida** 3249, 0255 Spanish vocals and instrumentals into program *Momento Cristiano* at 0302. **La Voz Evangelica** 4819, 1025 contemporary Spanish Christian vocals. (Joe Wood, Greenback, TN)

0257 UTC on 5010
MADAGASCAR: RTV Malagasy. Opening with lite music to ID by female announcer as "Radio Madagasikara." Vernacular talks and news for eleven minutes to music resumption. (Garcia, MD) **Radio Netherland's Madagascar** relay on 11655 at 2010 with documentary focus on new book of Turkish/Armenian war. (Bob Fraser, Belfast, ME)

0315 UTC on 5910
CLANDESTINE: Radio Republica. Spanish announcement with station ID/frequency information. SINPO 24432. Clandestines monitored in Chinese: **Sound of Hope** 7280, 1100-1105; 9635, 2205-2209; Minghui 7105, 2210-2216. **Voice of Iraqi Kurdistan** in Kurdish 6335, 0246-0251; **Darfur Salaam** 17585, 1700-1705 with Arabic sign-on IDs and info. **Voice of Biafra International**, English 7380, 2115-120. (Arnaldo Slaen, Buenos Aires, Argentina)

0935 UTC on 4545.04
BOLIVIA: Radio Norteño. Aymara/Spanish text about the *Movimiento al Socialismo* to station ID. Bolivians monitored in Spanish: **Radio Nacional de Huanuni** 5967.98, 1003-1010 , 1033-1045; **Radio Cooperativa** 5983.31, 1033-1043; **Radio Panamericana** 6106.83, 1035-1045; **Radio San Rafael** 5680, 2215-2240; **Radio San Jose** 5580, 2335-2338. (Slaen, ARG)

0952 UTC on 6960
RUSSIA: Radio St. Tikhy Okean. Russian folk music and talk to station identification. (Slaen, ARG)

1356 UTC on 11715
USA: KJES. Good signal for responsive readings and children's choir. WWRB 11915, 1935-2002+.(Wood, TN) Radio Marti in Spanish 9565 at 1827. (Frodge, MI)

1509 UTC on 11870
COSTA RICA: University Network. Gospel music including tune by Willie Nelson. Good signal on recheck 1807-1855. (Wood, TN) Noted Cuban interference at 1733. (Frodge, MI)

1513 UTC on 13600
THAILAND: VOA relay. *New From Thailand* and mentions of an archeological find. **VOA Botswana** relay 15580, 1750-1810 with ID and *African News Today*. News and commentary. (Wood, TN)

1620 UTC on 15170
GREECE: Radio Farda relay. Greek service into ID and pop music program. (Frodge, MI) **Sri Lanka's Radio Farda** relay 9335, 1902. (Frodge, MI) Greece's **Radiofonikos Stathmos Makedonias** 7450, 2145+. (Slaen, ARG) **Voice of Greece** 15630, 1515 with economic news and efforts to preserve Hellenic culture. Opera music to 1559* //9775, 12105. (Garcia, MD)

1830 UTC on 11590
ISRAEL: Kol Israel. Thirteen minutes of English newscast and weather. Items on electoral voting calender and unemployment figures //9345, 7545 to 1845*. (Garcia, MD) 11590, 1902 with Israeli news and weather to ID as "Kol Israel-the Voice of Israel." Program, *Israel Art*. (Frodge, MI) 7545, 2000 news read by Jackie Beecham. (Fraser, ME)

1904 UTC on 11620
INDIA: All India Radio (Bangalore). Closing news item to ID at 1905, followed by *Indian Press Review*. Station ID and *Indian Art News*. (Frodge MI) 1922-1945 subcontinental music and commentary. (Wood, TN)

1925 UTC on 9610
CONGO REP: RTV Congolaise. French into local languages. Native chants and lite pop style tunes. Presumed ID spot at 2000 and heard "kilohertz" mentioned. Fair quality with SIO 353 to about 1940 to drop off. (Frodge, MI) "Ici Radio Congo" heard 9610, 1925-1940. (Slaen, ARG)

2000 UTC on 12085
SYRIA: Radio Damascus. ID and three minutes of middle eastern news. Arabic music to segment on Syrian civilization, followed by national news and vocals. Comments on Palestine and Israel, closing with address/schedule to 2059*. (Garcia, MD)

2045 UTC on 6165
CHAD: Rdif. Nationale Tchadienne. French. Afro pops and native music and song. Station ID 2200 as, "Radiodiffusion Nationale Tchadienne." National news with coverage of recent failed coup d'etat from Sudanese militia. Closed with orchestral national anthem. (Anker Petersen/DX Window)

2110 UTC on 15515
AUSTRALIA: Radio Australia. News program and remote reports and station ID between segments. Radio New Zealand's *Dateline Pacific* news program with ID. Radio Australia ID at 2157 with freqs and program info. *RA News* with SIO 333+; 11650, 2145-2159. (Frodge, MI)

2123 UTC on 7255
NIGERIA: Voice of. French service with Afro-jazz program to "Ici la voix du Nigeria" identification SIO 3+43+. (Frodge, MI) **Radio Nigeria (Kaduna)** 4770, 2133+. (Slaen, ARG) **Radio Nigeria (Ikorodu)** 15120, 1900 with news and and African tropical music. (Garcia, MD) 1940-1945 ID and news on Congo, Reunion Island and the Sudan. (Wood, TN)

2140 UTC on 5030
BURKINA FASO: Radio Burkina. Rock/hip-hop and regional tunes to French announcements. ID and world news at 2200. (Brian Bagwell, St. Louis, MO) Sports roundup on 5030, 2205+. (Slaen, ARG)

2205 UTC on 9990
EGYPT: Radio Cairo. Item on opening of a large archaeology museum in Cairo. Five second pips at 2215 to news and comments on Islam and Arabic vocals. Programming close down at 2245*. 7270, 0200. Holy Koran to 0213. Station ID, news and commentaries to 0229. (Garcia, MD)

2215 UTC on 6612
ZIMBABWE: ZBC. Vernacular text to Afro pops and female announcer's chat. SINPO 24432. (Slaen, ARG) 6612, 2254-2305+, no sign of ZBC on 3306 or 6688. (Frodge, MI)

2256 UTC on 6950
PIRATE: WTPR. Tentative, may have been portion of MAC Shortwave program. Several IDs and mentions of "check your tire pressure" amid heavy static. **MAC Shortwave** 6950, 2309-2350+ with music medley from 1950-1960's era. **Voice of Captain Ron** 6925, 2352 with rock music and IDs from Capt. Ron. **Radio Boston** 6925, 0050-0117*. (Wood, TN) South American pirate **Radio Bosques** 6189, 1912+ Spanish. (Slaen, ARG)

2330 UTC on 6145
CANADA: China Radio International relay. *People in the Know* program, followed by discussion of instability within the Italian government. Continued coverage on Italy's role in European powers and the U.S. involvement in Iraq. (Branco, NY)

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

PROGRAMMING SPOTLIGHT

WHAT'S ON WHEN AND WHERE?

John Figliozzi, KC2BPU
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Compleat Summer Guide to BBC in North America

We extend our apologies for the repeated column in the June issue. The intended June column has been updated for July.

With the now near total elimination of BBCWS shortwave broadcasts to the Western Hemisphere, we must be darn close to the tipping point where a still-devoted BBC listener on this continent is no longer able to secure acceptable reception to the service using shortwave. While there are still some frequencies for other areas which come through quite regularly, one has to admit that this is becoming a harder, and sometimes frustrating, slog. Prime time evening "reception" is now only possible via the internet and subscription satellite, namely XM and Sirius, and there are other, lengthier periods of shortwave silence as well. These realities are reflected in the listings below. Nonetheless, the WS is available to us around the clock, albeit not always via shortwave.

Extensive Program Changes

By now, avid BBC listeners know that the WS made significant changes to its programming back in April. Gone from the schedule are *British News, Everywoman, In Concert, In Praise of God, Masterpiece, Music Review, The Music Biz, The Music Feature, Off the Shelf, Pick of the World, Sports International* and *White Label*. *Go Digital* has become **Digital Planet**. *Health Matters* has become **Health Check**. *People and Politics* is now **Politics UK**. *Play of the Week* now goes by **BBC World Drama**; and *Write On* is now called **Over to You**.

New to the schedule are **Business Daily** and a third **Documentary** series. **Culture Shock** looks at global social and economic trends. **On Screen** deals with world cinema, television and video gaming. The global popular music industry is covered in **The Beat**, while **Close Up** is yet another documentary series examining creative and artistic trends. Sixteen weeks of the year, **Music Performance** will offer a selection of world class recitals and concerts, including The BBC Proms Season and the best in world music.

The religion/spiritual program **Heart and Soul** has been extended to thirty minutes and its coverage widened. The popular daily human interest current affairs program, **Outlook**, now covers an hour.

Finally, **Top of the Pops** continues, but only to Australasia and the Far East, while **Business Brief** will be heard only on the PRI stream to the Americas.

All times are expressed in UTC and day abbreviations conform to those used in **MT's Shortwave Guide**. The shortwave frequencies list all target regions and have been extensively researched. While generally providing acceptable reception in North America, they are more easily affected by propagation disturbances. Other frequencies not listed might offer acceptable reception irregularly. Consult **MT's Shortwave Guide** for additional frequencies in use. Since the BBC does not identify its regional streams on-air, they are not identified in these listings.

For further and updated information, consult the service's internet site at **www.bbcworldservice.com** where you also can sign up to receive a weekly program update via e-mail. A growing list of programs are available for on-demand listening and podcast.

Abbreviations Key:
Net-a = Internet Audio of **"BBC World Service Radio"** from *www.bbc.co.uk/worldservice/schedules/031001_nofreqs.shtml*
This is the Europe stream also heard parts of the day on shortwave.
Net-b = Internet Audio of the **"24 hour news channel"** from *www.bbc.co.uk/worldservice/schedules/031001_nofreqs.shtml*
SIRI = Sirius Satellite Radio, channel 141 relaying the Public Radio International (PRI) stream.
XM+ = XM Satellite Radio, channel 131 or via Internet Audio from *http://playlist.yahoo.com/makeplaylist.dll?id=57024*, both relaying the Americas stream.
5975 - 21470 = shortwave frequencies
***** = heard in western North America
Many local public radio stations in the U.S. also carry the BBC World Service, relaying the PRI stream ("SIRI" in the Tuning column). Check local listings for the times in your area. In most instances, carriage occurs primarily during the overnight hours.
News bulletins are given at :01 and :30.

UTC Day	Program	Tuning
0006		
D	World Briefing	SIRI, Net-b
S	The Ticket	XM+
	Music Performance	Net-a
M	Correspondent	XM+
M-A	World Briefing	Net-a
T	Documentary 1	XM+
W	Global Business	XM+
H	Documentary 2	XM+
F	Assignment	XM+
A	Documentary 3	XM+
	Reporting Religion	Net-a
0032		
S	The Interview	SIRI
	World Business Review	Net-b
M	Instant Guide	XM+
	World of Music	Net-a
T	Culture Shock	XM+
W	The Word	XM+
H	On Screen	XM+
F	The Beat	XM+
A	Close Up	XM+
	World Business Review	SIRI
	Reporting Religion	Net-b
0041		
M	Over to You	XM+
	Analysis	SIRI, Net-b
T-F	Analysis	SIRI, Net-b, Net-a
0050		
M	Sports Roundup	Net-b
M-F	Business Daily	SIRI
T-F	Sports Roundup	Net-a, Net-b
0106		
S	BBC World Drama	Net-a, XM+
	Correspondent	SIRI, Net-b
M	Music Performance	XM+
	World Briefing	SIRI, Net-a, Net-b
T-F	World Briefing	Net-a, XM+, SIRI, Net-b
A	Global Business	Net-a, XM+, SIRI, Net-b
0120		
M-F	World Business Report	SIRI, Net-a, Net-b
T-F	Sports Roundup	XM+
0132		
S	Close Up	SIRI
	The Interview	Net-b
M	World Briefing	SIRI, Net-b
	Heart and Soul	Net-a
T-F	World Briefing	XM+, SIRI, Net-b
T	Health Check	Net-a
W	Digital Planet	Net-a
H	Discovery	Net-a
F	One Planet	Net-a
A	Reporting Religion	SIRI
	World Football	XM+
	Science in Action	Net-a
	Politics UK	Net-b
0141		
S	The Instant Guide	SIRI
M-F	Analysis	Net-b
M	Business Daily	SIRI
T-F	Business Daily	XM+, SIRI
0150		
M-F	Sports Roundup	Net-b
0206		
S/M	The World Today	Net-a, XM+, SIRI, Net-b
T-A	The World Today	XM+, SIRI, Net-b
	Outlook	Net-a
0232		
S	Reporting Religion	Net-a, XM+, Net-b
	World of Music	SIRI
M	Politics UK	XM+
	Instant Guide	Net-a
T	Health Check	XM+
W	Digital Planet	XM+
H	Discovery	XM+
F	One Planet	XM+
A	The Interview	SIRI
	Science in Action	XM+
	World Business Review	SIRI, Net-b
0241		
M	Over to You	Net-a
0306		
D	World Briefing	7160
S	Correspondent	Net-a, XM+, SIRI, 7160, Net-b
M	Global Business	XM+
M-F	The World Today	SIRI, Net-a, Net-b, 7160
T-A	Outlook	XM+
A	Assignment	SIRI, Net-a, Net-b, 7160
0329		
M-F	African News	7160
0332		
S	Instant Guide	7160
	The Interview	XM+, Net-b
	The Word	SIRI
	Discovery	Net-a
M-F	Network Africa	7160
M	World of Music	XM+
A	Reporting Religion	SIRI
	Discovery	7160
	World Football	Net-a
	Politics UK	Net-b
0341		
S	Over to You	7160
0406		
D	World Briefing	Net-a, XM+, SIRI, Net-b, 6005, 6195, 7160, 9410
0420		
S/A	Sports Roundup	XM+, Net-b, 6005, 6195, 7160, 9410
S	Instant Guide	SIRI
M-F	World Business Report	Net-a, XM+, SIRI, Net-b, 6195, 9410
	Sports Roundup	6005, 7160
A	World Business Report	SIRI
0429		
M-F	African News	6005, 7160
0432		
S	Instant Guide	XM+
	World Business Review	SIRI
	Politics UK	Net-a, Net-b, 6005, 6195, 7160, 9410
M-F	World Briefing	XM+, SIRI, Net-a, Net-b, 6195, 9410
	Network Africa	6005, 7160
A	Discovery	XM+
	The Interview	SIRI, Net-a, Net-b, 6005, 6195, 7160, 9410
0441		
S	Over to You	XM+
M-F	Analysis	XM+, SIRI, Net-a, Net-b, 6195, 9410
0450		
M-F	Sports Roundup	XM+, SIRI, Net-a, Net-b, 6195, 9410
0506		
D	The World Today	Net-a, SIRI, Net-b, 6005, 6195, 7160, 9410
S	Music Performance	XM+
M	BBC World Drama	XM+
T	Documentary 1	XM+
W	Global Business	XM+
H	Documentary 2	XM+
F	Assignment	XM+
A	Documentary 3	XM+
0529		
M-F	African News	6005, 7160
0532		
S	Reporting Religion	SIRI, Net-a, Net-b, 6005, 6195, 7160, 9410
M-F	Network Africa	6005, 7160
T	Culture Shock	XM+
W	The Word	XM+
H	On Screen	XM+
F	The Beat	XM+
A	Close Up	XM+
	World Business Review	Net-a, Net-b, 6005, 6195, 7160, 9410
	One Planet	SIRI
0606		
S/A	The World Today	Net-a, XM+, SIRI, Net-b, 6195, 9410
S/A	Network Africa	6005
M-F	The World Today	Net-a, XM+, SIRI, Net-b, 6005, 6195, 9410
0629		
D	African News	6005
0632		
S	Politics UK	XM+, Net-b
	World of Music	SIRI
	The Interview	Net-a, 6195, 9410
D	Network Africa	6005
A	The Interview	XM+, Net-b
	The Word	SIRI
	World Football	Net-a, 6195, 9410
0706		
S-F	The World Today	XM+, SIRI, Net-a, Net-b
M	Talking Point	Net-b
T-F	Outlook	Net-b

A The Ticket SIRI
The World Today XM+, Net-a, Net-b
0732
S Heart and Soul Net-a
World Business Review XM+, Net-b
Close Up SIRI
M-F World Briefing XM+, Net-b
M Health Check SIRI
T The Word SIRI
W On Screen SIRI
H One Planet SIRI
F Science in Action SIRI
A Reporting Religion XM+, Net-b
The Ticket SIRI
Politics UK Net-a
0741
M-F Business Daily XM+, Net-a, Net-b
0806
S Correspondent XM+, SIRI, Net-a, Net-b
M-F World Briefing XM+, SIRI, Net-b
M Documentary 1 Net-a
T Global Business Net-a
W Documentary 2 Net-a
H Assignment Net-a
F Documentary 3 Net-a
A Assignment Net-a, XM+, SIRI, Net-b
0820
M-F World Business Report XM+, SIRI, Net-b
0832
S The Interview XM+, Net-b
Politics UK SIRI
Reporting Religion Net-a
M-F World Briefing XM+, Net-b
Outlook SIRI
M Culture Shock Net-a
T The Word Net-a
W On Screen Net-a
H The Beat Net-a
F Close Up Net-a
A Politics UK XM+, Net-b
The Interview SIRI
World Business Review Net-a
0841
M-F Analysis XM+, Net-b
0850
M-F Sports Roundup XM+, Net-b
0906
S The Ticket Net-a
S/A World Briefing XM+, SIRI, Net-b
M-F World Update XM+, SIRI, Net-b
Outlook Net-a
A Documentary 1 Net-a
0932
S Reporting Religion XM+, SIRI, Net-b
A World Business Review XM+, SIRI, Net-b
World of Music Net-a
1006
D World Briefing XM+, SIRI, Net-a, Net-b
1020
S Instant Guide SIRI
S/A Sports Roundup XM+, Net-a, Net-b
A World Business Report SIRI
1032
S Instant Guide Net-a, XM+
On Screen SIRI
Politics UK Net-b
M-F Analysis XM+
A The Interview XM+, SIRI, Net-b
Discovery Net-a
1041
S Over to You XM+
M-F Business Daily XM+, SIRI
Analysis Net-a, Net-b
A Over to You Net-a
1050
M-F Sports Roundup Net-a, Net-b
1106
D World Briefing XM+, SIRI, Net-b
S/A World Briefing Net-a, 11865
M-F Newshour Net-b
Caribbean Report 11865
M Documentary 1 Net-a
T Global Business Net-a
W Documentary 2 Net-a
H Assignment Net-a
F Documentary 3 Net-a
1110
M-F Sport Caribbean 11865
1120
M-F Caribbean Magazine 11865
World Business Report XM+, SIRI, Net-b
1132
S Heart and Soul XM+, 11865
The Interview SIRI, Net-a
Reporting Religion Net-b
M-F World Briefing XM+, SIRI, Net-b, 11865
M Health Check Net-a
T Digital Planet Net-a
W Discovery Net-a
H One Planet Net-a
F Science in Action Net-a
A Politics UK XM+, Net-b, 11865
World Business Review SIRI
World Football Net-a
1141
M-H Analysis XM+, SIRI, Net-b, 11865
F Analysis XM+, SIRI, Net-b
World Cricket 11865
1150
M-H Sports Roundup XM+, SIRI, Net-b, 11865
F Sports Roundup XM+, SIRI, Net-b
1206
S/A Newshour XM+, SIRI, Net-a, Net-b, 11865, 9740*
M-F Newshour XM+, SIRI, Net-a, Net-b
Caribbean Business 11865
1210
M-F Caribbean Report 11865
1220
M-F Caribbean Magazine 11865
1306
S Correspondent Net-a, 17640, 15565, 12095, XM+, SIRI, 9740*, Net-b
Documentary 3 21470
M-F Newshour 17640, SIRI, Net-b
Outlook XM+, Net-a, 21470, 17640, 15565, 12095
M Documentary 1 9740*
T Global Business 9740*
W Documentary 2 9740*
H Assignment 9740*
F Documentary 3 9740*
A Assignment XM+, SIRI, Net-b
Documentary 1 21470
Documentary 2 Net-a, 17640, 15565, 12095
The Ticket 9740*
1332
S Reporting Religion XM+
World Business Review SIRI, Net-a, 21470, 17640, 15565, 12095, Net-b
Politics UK 9740*
M Health Check 9740*
T Digital Planet 9740*
W Discovery 9740*
H One Planet 9740*
F Science in Action 9740*
A Instant Guide XM+
The Interview SIRI, Net-b
World of Music Net-a, 21470, 17640, 15565, 12095
1341
A Over to You XM+
1406
S Have Your Say XM+, SIRI, Net-a, 21470, 17640, 15565, 12095 Net-b, 9740*
M-F World Briefing SIRI, Net-a, 21470, 17640, 15565, 12095, Net-b, 9740*
M Documentary 1 XM+
T Global Business XM+
W Documentary 2 XM+
H Assignment XM+
F Documentary 3 XM+
A Sportsworld XM+, SIRI, Net-a, 21470, 17640, 15565, 12095, Net-b, 9740*
1432
M Health Check XM+, 21470
Culture Shock Net-a, 17640, 15565, 12095
T Digital Planet XM+, 21470
The Word Net-a, 17640, 15565, 12095
W Discovery XM+, 21470
On Screen Net-a, 17640, 15565, 12095
H One Planet XM+, 21470
The Beat Net-a, 17640, 15565, 12095
F Science in Action XM+, 21470
Close Up Net-a, 17640, 15565, 12095
1441
M-F Analysis SIRI, Net-b
M-F Business Daily 9740*
1450
M-F Sports Roundup SIRI, Net-b
1506
S Global Business SIRI, Net-a, 12095, 15565, 17640, 17830, Net-b
Documentary 1 9740*
Documentary 2 XM+
African Perspective 21470
M-F World Briefing XM+, SIRI, Net-a, 9740*, 12095 15565, 17640, Net-b
Focus on Africa 21470, 17830
A Sportsworld Net-a, 12095,XM+,21470,17640, 15565, 9740*,17830, Net-b
The Ticket SIRI
1532
S Politics UK Net-a, 17640, 15565, 12095, Net-b
World Business Review 9740*
Story Story 21470, 17830
Heart and Soul XM+
Reporting Religion SIRI
M-F World Briefing 21470
M Culture Shock XM+
Health Check Net-a, 17640, 15565, 12095
T The Word XM+
Digital Planet Net-a, 17640, 15565, 12095
W On Screen XM+
Discovery Net-a, 17640, 15565, 12095
H The Beat XM+
One Planet Net-a, 17640, 15565, 12095
F Close Up XM+
Science in Action Net-a, 17640, 15565, 12095
1541
M-F Sports Roundup 21470
World Business Report SIRI, Net-b, 9740*, 21470
F The Instant Guide Net-a, 12095, 17640, 15565
1550
M-F Analysis SIRI, 21470
Sports Roundup Net-b, 9740*
1606
D Focus on Africa 17830
S Sunday Sportsworld Net-a, 12095, 21470, XM+, Net-b
The Ticket SIRI
M-F Europe Today Net-a, 12095, XM+, SIRI, Net-b
M/F Fast Track 21470
T-H Africa, Have Your Say 21470
A Sportsworld Net-a, 12095, 21470, XM+, Net-b
Global Business SIRI
1632
A Culture Shock SIRI
1706
D Focus on Africa 21470, 17830, 15400
S The Word SIRI
World Briefing XM+, Net-a, 12095, Net-b
M-F World Have Your Say Net-a, 12095, XM+, SIRI, Net-b
A World Briefing XM+, Net-a, 12095, Net-b, SIRI
1732
S Close Up SIRI
The Interview XM+, Net-b
Heart and Soul Net-a, 12095
A The Interview 17830
World Business Review XM+, SIRI, Net-b
Instant Guide Net-a, 12095
1741
S Over to You Net-a, 12095
1745
D Sports Roundup 21470, 17830, 15400
1806
D World Briefing Net-b
S Have Your Say XM+, SIRI, Net-b, 21470, 17830, 15400
Music Performance Net-a, 12095
M-F World Briefing XM+, Net-a, 12095, Net-b
Outlook SIRI
World Have Your Say 21470, 17830, 15400
A The Ticket XM+, Net-a, 12095
Global Business SIRI, Net-b
Correspondent 17830, 15400
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1820
S Sports Roundup XM+, SIRI
M-F World Business Report XM+, Net-a, 12095, Net-b
A Sports Roundup SIRI
1832
S The Ticket Net-a
M-F World Briefing XM+, Net-b
M Culture Shock Net-a, 12095
T The Word Net-a, 12095
W On Screen Net-a, 12095
H The Beat Net-a, 12095
F Close Up Net-a, 12095
A World of Music SIRI
Politics UK Net-b, 17830, 15400
1841
M-F Analysis XM+, Net-b
1850
S Instant Guide XM+, SIRI, Net-b, 17830, 15400
M-F Sports Roundup XM+
1906
D World Briefing SIRI, Net-b
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World Briefing XM+
Have Your Say Net-a
M-F Focus on Africa 17830, 15400, 12095
M Documentary 1 XM+, Net-a
T` Global Business XM+
W Documentary 2 XM+, Net-a
H Assignment XM+, Net-a
F Documentary 3 XM+, Net -a
A BBC World Drama XM+, Net-a
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1920
M-F World Business Report SIRI, Net-b
1932
S Heart and Soul XM+
The Interview SIRI
World Business Review Net-b
M-F World Briefing SIRI, Net-b, 17830, 15400, 12095
M Health Check Net-a
Culture Shock XM+
T Digital Planet Net-a
The Word XM+
W Discovery Net-a
On Screen XM+
H One Planet Net-a
The Beat XM+
F Science in Action Net-a
Close Up XM+
A The Word SIRI
The Interview Net-b, 12095
Story Story 17830, 15400
1941
M-F Analysis SIRI, Net-b, 17830, 15400
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1950
S The Instant Guide Net-a
M-F Sports Roundup SIRI, Net-b, 17830, 15400
2000
D Newshour XM+, SIRI, Net-a, Net-b, 12095
2106
D Newshour 12095, 15400
S World Briefing XM+, SIRI, Net-b, 11675, 15390
BBC World Drama Net-a
M-F Sports Roundup 11675, 15390
World Briefing XM+, SIRI, Net-a, Net-b
A World Briefing XM+, SIRI, Net-a, Net-b, 11675,15390
2115
M-F Caribbean Report 11675, 15390
2120
S Business Brief SIRI
Sports Roundup XM+, Net-b, 11675, 15390
A Instant Guide SIRI
Sports Round-up XM+, Net-a, Net-b, 11675, 15390
2132
S Instant Guide XM+, 15390
Reporting Religion SIRI, Net-b
M-F Business Daily XM+, Net-a, 15390
Outlook SIRI
A Discovery XM+, 15390
The Interview SIRI, Net-a, Net-b
2141
S Over to You XM+, 15390
M-F Analysis Net-b
F The Instant Guide 15400
2150
M-F Sports Roundup XM+, Net-a, Net-b, 15390
2206
D The World Today Net-b
S Documentary 1 XM+, 5975
World Briefing SIRI, Net-a, Net-b
Music Performance 12095, 15400
M-F World Briefing XM+, SIRI, Net-a, Net-b, 15400, 12095, 5975
A Music Performance Net-a
Correspondent XM+, SIRI, Net-b, 5975
Documentary 2 15400, 12095
2220
S World Business Report SIRI, Net-a, Net-b
M-F World Business Report XM+, SIRI, Net-b, 15400, 12095
Analysis Net-a
2232
S World Briefing SIRI, Net-a, Net-b
Heart and Soul XM+, 5975
M-H World Briefing SIRI, Net-b
M-F World Business Report Net-a, 5975
M Health Check XM+, 5975, 12095, 15400
Culture Shock Net-a
T Digital Planet XM+, 5975, 12095, 15400
The Word Net-a
W Discovery XM+, 5975, 12095, 15400
On Screen Net-a
H One Planet XM+, 5975, 12095, 15400
The Beat Net-a
F Science in Action XM+, 5975, 12095, 15400
The Interview SIRI
Poltics UK Net-b
Close Up Net-a
A World Business Review XM+, SIRI, Net-b, 5975
World of Music 12095, 15400
2241
S-H Analysis SIRI, Net-b
2250
S-H Business Brief SIRI
Sports Roundup Net-b
2306
S/A The World Today Net-a, SIRI, Net-b
M-F The World Today SIRI, Net-b
S Documentary 3 XM+
M-F Outlook XM+
M Documentary 1 Net-a
T Global Business Net-a
W Documentary 2 Net-a
H Assignment Net-a
F Documentary 3 Net-a
A Assignment XM+
2332
S World of Music XM+
M Health Check Net-a
T Digital Planet Net-a
W Discovery Net-a
H One Planet Net-z
F The Interview Net-b
Politics UK SIRI
Science in Action Net-a
A Reporting Religion SIRI, Net-a, Net-b
Politics UK XM+

THE QSL REPORT

VERIFICATIONS RECEIVED BY OUR READERS

Gayle Van Horn, W4GVH
gaylevanhorn@monitoringtimes.com

Scorcher QSLing 2006

It's July again and time for *MT*'s annual scorchers. This month we focus on nothing but QSLs, an annual tradition that has grown in popularity. We dispense this month with info and tips to bring you the latest and best verifications from our readers. Contributions are always welcome either via email or regular mail, and if a personal reply is desired, please include a self-addressed-envelope.

Next month we'll give you a head start into the upcoming DX season. Good luck on your QSLing, and make this month a super hot July...wherever the DX takes you!

AMATEUR RADIO

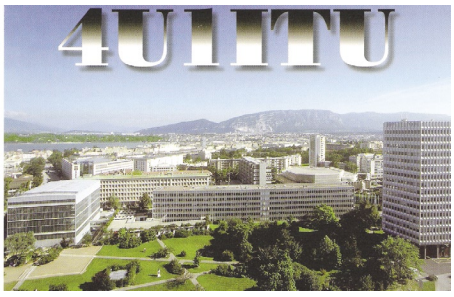
Desecho Island Project-N3KS/KP5 (IOTA NA-095) 20 meters SSB. Full data color four sided QSL for a SASE. QSL address: John F. King W3ADC, P.O. Box 64, Hampstead, MD 21074. (Ken Reitz KS4ZR, VA) *Welcome to MT's Beginner's Corner column - GVH*

Georgia-4L6AM, 20 meters SSB. Full data color card. Received in 22 days for two U.S. dollars and a nested self-addressed-envelope. QSL address: Boris Chudacov 4Z5CU, P.O. Box 387, Yeroham 80500 Israel. (Reitz, VA)

Netherlands-PA3GSU, 17 meters SSB. B&W full data card. Received in 382 days via ARRL bureau. (Larry Van Horn N5FPW/NC)

Spain-EA3BOX, 40/17 meters SSB. Two full data color cartoon cards. Received in four months via ARRL bureau. (Van Horn/NC)

Switzerland-4U1ITU, International Telecommunications Union Headquarters, Geneva. Full data color card. Received in three months, 19 days. QSL address: IARC, P.O. Box 6, CH-1211 Geneva, 20, Switzerland. (Reitz, VA)



United Kingdom-G3AB, 14.020 kHz CW. Full data QSL card. Received in 13 days for a SWL card and one US dollar. QSL address: Andy Chadwick-G3AB, 5 Thorpe Chase, Ripon, North Yorkshire HG4 1UA United Kingdom. (Greg Harris WDX9KHY, Park Forest, IL)

BELARUS

Radio Belarus 7105 kHz. Full data station card signed by Larisa Suarez, plus schedule. Received in 28 days for an English report. Station address: Cyvonaja Street 4, 220807 Minsk, Belarus. Website: **www.tvr.by** (Arnaldo Slaen, Buenos Aires, Argentina)

FRENCH GUIANA

NHK World/Radio Japan 9530 kHz. Full data QSL card and schedule. Received in 23 days for reception report to: **rj-espa@int.nhk.or.jp**. Station address:Nippon Hoso Kyokai, Tokyo 150-8001 Japan. Website: **www.nhk.or.jp/nhkworld** (Slaen, ARG)

GERMANY

Mecklenburg-Vorpommern Baltic Radio 6130 kHz. Transmits via T-Systems International, Jülich, Germany. Received in ten days for an English report to Walter Brodowsky **brodowsky@t-systems.com** Direct response verification received from "Roland" in 24 hours for email report to: **info@mvbalticradio.de** . (Edward Kusalik, Alberta, Canada)

GREENLAND

KNR-Kalaalit Nunaata Radioa 3815 kHz USB. Verification letter signed by Ms. Ivalu Søvndahl Pedersen-Communications Assistant. Received in two months. Station address: Kalaalit Nunaata Radioa-TV, Vandsøvej 15, Postbok 1007, DK-3900 Nuuk, Greenland. (J.D. Stephens, Hampton Cove, AL/Cumbre DX)

GUYANA

Guyana Broadcasting Corp., 3291.2 kHz. Partial data form letter signed by S. Goodman-Chief Engineer. Received in 70 days for an English report. Station address: National Communications Network Inc. Radio, Homestretch Avenue, D'Urban Park, Georgetown, Guyana. (Jerry Berg, MA/Cumbre DX)

INDIA (GOA)

All India Radio-Panaji 9705 kHz. Full data scenery card signed by Y.K. Sharma-Spectrum Management Director. Received in 68 days for posting reception report at: **www.allindiaradio.org/recepfdk.html** Station address: External Service Division, Spectrum Management, All India Radio, Room 204, Akashani Bhaven, New Delhi 110 001 India. Website: **http://allindiaradio.org/** (Tom Banks, Dallas, TX) *For country counters-Goa counts as a country separate from India. - GVH*

KOREA (REPUBLIC)

KBS World Radio 9580 kHz. Full data Geumgang Mount scenery card unsigned. Received in 38 days for an English report. Station address: P.O. Box 150-790 Seoul, Republic of Korea. Website: **http://kbs.co.kr** (Banks, TX)

MEDIUM WAVE

Dominican Republic-Radio Anacaona, 2288 kHz (harmonic of 1140 kHz AM). Email reply from Dr. Mauel A. Bello-Director Ejecutivo, received in 33 days. Reply came from **lidiabelloo@hotmail.com,** reply listed as **radioanacaona@verizon.com.do** as the station's "correo electronico de la emisora." Station address: Radio Anacaona, Calle Club de Leones N°175 (or) Apartado 37, San Juan de la Maguana, Dominican Republic. (Rich D'Angelo, PA/Cumbre DX/NASWA) *Another nice catch! - GVH*

KNSS (*News Radio*) 1330 kHz AM. Prepared QSL form signed by Tony Duesing-Program Director. Received in 122 days. Station address: 2120 N. Woodlawn Street # 352, Wichita, KS 67208. (Patrick Martin, Seaside, OR)

WCBA 1350 kHz AM. Full data prepared card signed by Paul Lyle-Gen. Manager. Received in eight days for an AM report and an SASE. Station address: 2761 Davis Road, Corning, NY 14830. (Harris, IL)

WCRV (*Bott Radio Network*) 640 kHz AM. Partial data letter on network letterhead signed by Tim Guess. Received in 11 days for an AM report. Station address: 555 Perkins Ext, Suite 201, Memphis, TN 38117. Website: **www.bottradio-network.com** (Bill Wilkins, Springfield, MO)

WVNN 770 (*News Talk 770*) kHz AM. Full data card signed by Josh Bohn-Chief Engineer. Received in 90 days for DX Test report. Station address: 1717 Hwy 72 East, Athens, AL 35611. AL QSL # 15. (Martin, OR)

PAKISTAN

Radio Pakistan 11570 kHz. Full data Alamgiri Gate card and letter signed by Muhammad Ayub-Engineering Manager. Received in 68 days for one IRC. Station address: P.O. Box 1393, Islamabad 44000 Pakistan. Website: **www.radio.gov.pk** (Scott Barbour, Intervale, NH)

SLOVAKIA

Radio Slovakia International 7230 kHz. Full data *Bratislava Presidential Palace* scenery card unsigned. Received in 27 days for an email report to: **englishsection@slovakradio.sk** Station address: Mytna 1, 817 55 Bratislava, Slovakia. Website: **www.slovakradio.sk** (Kraig Krist KG4LAC, Manassas, VA)

UNITED STATES

KJES 11715 kHz. Full data handwritten letter unsigned, plus KJES info letter. Received in 26 days for an English report and one US dollar. Station address: KJES-The Lord's Ranch, 230 High Valley Road, Vado, NM 88072. (Krist, VA)

WEWN 9925 kHz. Full data antenna farm QSL card. Received in 13 days for an English report and one US dollar. Station address: 5817 Old Leeds Road, Irondale, AL 35210. Website: **www.ewtn.com/radio/index.asp** (Krist, VA)

UTILITY

FDG/FDY, French Air Force-Bordeaux, France 7960 kHz. Full data card, letter, postcards and souvenir stickers. Received in two weeks for a utility report and two US dollars. Station address: Armee de l'Air France-Station FDY, ERGE 10538, BA 123, Boite Postal 01, 45998 Orleans Armee, France. (Jim Pogue, Memphis, TN) *Welcome, Jim! - GVH*

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 Savings 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. On the top half of the page 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:

Day Codes	
s/S	Sunday
m/M	Monday
t/T	Tuesday
w/W	Wednesday
h/H	Thursday
f/F	Friday
a/A	Saturday
D	Daily
mon/MON	monthly
occ:	occasional
DRM:	Digital Radio Mondiale

In the same column ⑤, irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "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
au:	Australia
ca:	Central America
do:	domestic broadcast
eu:	Europe
irr:	irregular (Costa Rica RFPI)
me:	Middle East
na:	North America
oc:	Oceania
pa:	Pacific
sa:	South America
va:	various

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Thank You ...

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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. They are only authorized on a non-interference basis until that date.

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	0015	vl	Cambodia, National Radio	11940as		
0000	0015		Japan, Radio Japan/NHK World			13680as
			17810as			
0000	0015	s	USA, WRMI Miami FL	9955am		
0000	0030		Australia, HCJB	15405as	15525as	
0000	0030		Burma, Dem Voice of Burma	5955eu		
0000	0030		Egypt, Radio Cairo	11950na		
0000	0030		Thailand, Radio	9570af		
0000	0030		UK, BBC World Service	3915as	5970as	
			9740as	9790as	11945as	15360as
			17615as			
0000	0030		USA, Voice of America	7555as		
0000	0045		India, All India Radio	9705as	9950as	
			11620as	11645as	13605as	
0000	0045		USA, WYFR Okeechobee FL	17805am		
0000	0057		Canada, Radio Canada Intl	11700as		
0000	0059		Spain, Radio Exterior Espana	15385am		
0000	0100		Anguilla, Caribbean Beacon	6090am		
0000	0100		Australia, ABC NT Alice Springs			2310irr
			4835do			
0000	0100		Australia, ABC NT Katherine	5025do		
0000	0100		Australia, ABC NT Tennant Creek			4910do
0000	0100		Australia, Radio	9660pa	12080pa	13670pa
			15240va	17715pa	17750as	17775va
			17795va			
0000	0100		Canada, CFRX Toronto ON	6070do		
0000	0100		Canada, CFVP Calgary AB	6030do		
0000	0100		Canada, CKZN St John's NF	6160do		
0000	0100		Canada, CKZU Vancouver BC	6160do		
0000	0100		Canada, Radio Canada Intl	9755am		
0000	0100		China, China Radio Intl	6020na	9515as	
			9570na	13600eu		
0000	0100		Costa Rica, University Network			5030va
			6150va	7375va	9725va	
0000	0100	fasm	Germany, Bible Voice Broadcasting			6140as
0000	0100		Germany, Deutsche Welle	9695as	9825as	
			9885as			
0000	0100		Guyana, Voice of	3291do		
0000	0100		Italy, RAI Intl	11800na		
0000	0100		Japan, Radio Japan/NHK World			6145na
0000	0100		Malaysia, RTM/Trax FM	7295as		
0000	0100	vl	Namibia, Namibian BC Corp	3270do	3290do	
			6060do	6175do		
0000	0100		Netherlands, Radio	9845na		
0000	0100		New Zealand, Radio NZ Intl	15720pa		
0000	0100	vl	Papua New Guinea, Wantok R.Light			7120va
0000	0100		Singapore, MediaCorp Radio	6150do		
0000	0100		UK, BBC World Service	6195as	9410as	
			11955as	15280as	15310as	17790as
0000	0100	DRM	UK, BBC World Service	6010na		
0000	0100		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
0000	0100		USA, KAIJ Dallas TX	5755na		
0000	0100		USA, KTBN Salt Lake City UT	7505na		
0000	0100		USA, KWHR Naalehu HI	17655as		
0000	0100		USA, WBCQ Kennebunk ME	5110na	7415na	
			9330na			
0000	0100		USA, WBOH Newport NC	5920am		
0000	0100		USA, WEWN Birmingham AL	5035va	5835va	
0000	0100		USA, WHRA Greenbush ME	7520na		
0000	0100	m	USA, WHRI Noblesville IN	7490am	7555am	
0000	0100	twhfa	USA, WHRI Noblesville IN	9820am	13760am	
0000	0100		USA, WINB Red Lion PA	9265am		
0000	0100	twhfa	USA, WRMI Miami FL	7385am		
0000	0100		USA, WTJC Newport NC	9370na		
0000	0100		USA, WWCR Nashville TN	3215na	5070na	
			7465na	13845na		
0000	0100		USA, WWRB Manchester TN	3185na	5050na	
			5745na	6890na		
0000	0100		USA, WYFR Okeechobee FL	6065am	9505am	
			11835am			
0000	0100		Zambia, Christian Voice	4965af		
0015	0030	a	Austria, Radio Austria Intl	9870am		
0015	0030	m	USA, WRMI Miami FL	9955am		
0030	0045	s	Germany, Pan American BC	9640as		
0030	0045	s	USA, WRMI Miami FL	9955am		
0030	0100		Lithuania, Radio Vilnius	11690na		
0030	0100		Thailand, Radio	5890na		
0030	0100		UK, BBC World Service	5970as	6195as	
			9410as	9790as	11955as	15280as
			15310as	15360as		
0030	0100		USA, Voice of America	9715va	9780va	
			15185va	15205va	15290va	15560va
			17740va	17820va		
0035	0100	sm	Austria, Radio Austria Intl	9870am		
0043	0058	twhfa	Austria, Radio Austria Intl	9870am		

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

0100	0115		Italy, RAI Intl	11800na		
0100	0127		Czech Rep, Radio Prague	6200na	7345na	
			9440na			
0100	0128		Vietnam, Voice of	6175na		
0100	0129	s	Germany, Universal Life	9430as		
0100	0130		Hungary, Radio Budapest	9590na		
0100	0130		Slovakia, Radio Slovakia Intl	5930na	9440sa	
0100	0156		Romania, Radio Romania Intl	9690na	11825na	
0100	0159		Canada, Radio Canada Intl	9755am	13710am	
0100	0200		Anguilla, Caribbean Beacon	6090am		
0100	0200		Australia, ABC NT Katherine	5025do		
0100	0200		Australia, ABC NT Tennant Creek			4910do
0100	0200		Australia, Radio	9660pa	12080pa	13670pa
			15240va	15415va	17715pa	17750as
			17775va	17795va		
0100	0200		Canada, CFRX Toronto ON	6070do		
0100	0200		Canada, CFVP Calgary AB	6030do		
0100	0200		Canada, CKZN St John's NF	6160do		
0100	0200		Canada, CKZU Vancouver BC	6160do		
0100	0200	DRM	China, China Radio Intl	6140na		
0100	0200		China, China Radio Intl	6020na	6080na	
			9570na	9580na	9790na	11870as
			13600eu	13640as		
0100	0200		Costa Rica, University Network			5030va
			6150va	7375va	9725va	
0100	0200		Cuba, Radio Havana	6000na	9820na	
0100	0200	fasm	Germany, Bible Voice Broadcasting			6140as
0100	0200		Guyana, Voice of	3291do		
0100	0200		Indonesia, Voice of	9525as	11785pa	
			15150al			
0100	0200		Japan, Radio Japan/NHK World			5960va
			11720va	11935sa	15325as	17685oc
			17810as	17825va	17845as	
0100	0200		Malaysia, RTM/Trax FM	7295as		
0100	0200	vl	Namibia, Namibian BC Corp	3270do	3290do	
			6060do	6175do		
0100	0200		Netherlands, Radio	9845na		
0100	0200		New Zealand, Radio NZ Intl	15720pa		
0100	0200		North Korea, Voice of Korea	7140as	9345as	
			9730am	11735ca	13760ca	15180ca
0100	0200	vl	Papua New Guinea, Wantok R.Light			7120va
0100	0200		Russia, Voice of	7250na	9665na	15555na
			15595na			
0100	0200		Singapore, MediaCorp Radio	6150do		
0100	0200		Sri Lanka, SLBC	6005eu	9770eu	15745eu
0100	0200		Taiwan, Radio Taiwan Intl	15465na	11875sa	
0100	0200		UK, BBC World Service	6195as	9410as	
			11955as	15280as	15310as	15360as
			17790as			
0100	0200		Ukraine, Radio Ukraine Intl	5830na		
0100	0200		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
0100	0200		USA, KAIJ Dallas TX	5755na		
0100	0200		USA, KTBN Salt Lake City UT	7505na		
0100	0200		USA, KWHR Naalehu HI	17655as		
0100	0200		USA, Voice of America	9885va	11705va	
			11725va			
0100	0200		USA, WBCQ Kennebunk ME	5110na	7415na	
			9330na			
0100	0200		USA, WBOH Newport NC	5920am		
0100	0200		USA, WEWN Birmingham AL	5035va	5835va	
0100	0200		USA, WHRA Greenbush ME	5850na		
0100	0200		USA, WHRI Noblesville IN	5875am	7490am	
			9515am			
0100	0200	sm	USA, WHRI Noblesville IN	7315am		
0100	0200		USA, WINB Red Lion PA	9265am		
0100	0200	twhfa	USA, WRMI Miami FL	7385am		
0100	0200	s	USA, WRMI Miami FL	9955am		
0100	0200		USA, WTJC Newport NC	9370na		
0100	0200		USA, WWCR Nashville TN	3215na	5070na	
			5935na	7465na		
0100	0200		USA, WWRB Manchester TN	3185na	5050na	
			5745na	6890na		
0100	0200		USA, WYFR Okeechobee FL	6065va	9505va	
			15195va			
0100	0200		Uzbekistan, Christian Vision	7355as		
0100	0200		Zambia, Christian Voice	4965af		
0105	0130	sm	Austria, Radio Austria Intl	9870am		
0113	0130	twhf	Austria, Radio Austria Intl	9870am		
0113	0200	sm	Austria, Radio Austria Intl	9870na		
0115	0130	twhf	Armenia, FEBA	7365as		
0130	0200		Iran, Voice of the Islamic Rep	7235am	9495am	
0130	0200		Sweden, Radio	6010na	9435va	
0130	0200	twhfa	USA, Voice of America	7405am	13740am	
0140	0200		Vatican City, Vatican Radio	7335as	9650as	
0143	0158	twhfa	Austria, Radio Austria Intl	9870na		
0145	0200	twhfas	Albania, Radio Tirana	6115eu	7455eu	
0145	0200	w	Australia, HCJB	15405as		

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

0200	0230		Belarus, Radio	5970eu	6170eu	7210eu
0200	0230		Iran, Voice of the Islamic Rep	7235am	9495am	
0200	0245		USA, WYFR Okeechobee FL	11835va		
0200	0300		Anguilla, Caribbean Beacon	6090am		
0200	0300	twhfa	Argentina, RAE	11710am		
0200	0300		Australia, ABC NT Alice Springs 4835do			2310irr
0200	0300		Australia, ABC NT Katherine	5025do		
0200	0300		Australia, ABC NT Tennant Creek			4910do
0200	0300		Australia, Radio	9660pa	12080pa	13630pa
			13670pa	15240va	15415va	15515va
			17750as	21725va		
0200	0300		Bulgaria, Radio	9700na	11700na	
0200	0300		Canada, CFRX Toronto ON	6070do		
0200	0300		Canada, CFVP Calgary AB	6030do		
0200	0300		Canada, CKZN St John's NF	6160do		
0200	0300		Canada, CKZU Vancouver BC	6160do		
0200	0300		China, China Radio Intl	11870as	13640as	
0200	0300		Costa Rica, University Network			5030va
			6150va	7375va	9725va	
0200	0300		Cuba, Radio Havana	6000na	9820na	
0200	0300		Egypt, Radio Cairo	7270na		
0200	0300		Guyana, Voice of	3291do		
0200	0300		Malaysia, RTM/Trax FM	7295as		
0200	0300	vl	Namibia, Namibian BC Corp	3270do	3290do	
			6060do	6175do		
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		7120va	
0200	0300		Philippines, Radio Pilipinas	11885va	15270va	
			17665va			
0200	0300		Russia, Voice of	9665na	9860na	15555na
			15595na			
0200	0300		Singapore, MediaCorp Radio	6150do		
0200	0300		South Korea, KBS World Radio			9560na
			11810sa	15575na		
0200	0300		UK, BBC World Service	6195me	11760me	
			11955as	15280as	15310as	15360as
			17790as			
0200	0300		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
0200	0300		USA, KAIJ Dallas TX	5755na		
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 Kennebunk ME	5110na	7415na	
			9330na			
0200	0300		USA, WBOH Newport NC	5920am		
0200	0300		USA, WEWN Birmingham AL	5035va	5835va	
0200	0300		USA, WHRA Greenbush ME	5850na		
0200	0300	sm	USA, WHRI Noblesville IN	7315am		
0200	0300		USA, WHRI Noblesville IN	5875am	7490am	
			9515am			
0200	0300		USA, WINB Red Lion PA	9265am		
0200	0300	twhfa	USA, WRMI Miami FL	7385am		
0200	0300	twhfa	USA, WRMI Miami FL	7385am		
0200	0300		USA, WTJC Newport NC	9370na		
0200	0300		USA, WWCR Nashville TN	3215na	5070na	
			5935na	7465na		
0200	0300		USA, WWRB Manchester TN	3185na	5050na	
			5745na	6890na		
0200	0300		USA, WYFR Okeechobee FL	5985va	6065va	
			9505va	11855va		
0200	0300		Uzbekistan, Christian Vision	7355as		
0200	0300		Zambia, Christian Voice	4965af		
0200	3000		Taiwan, Radio Taiwan Intl	5950na	9680na	
0215	0220		Vatican City, Vatican Radio	15560oc		
0215	0230		Nepal, Radio	3230as	5005as	6100as
			7165as			
0230	0258		Vietnam, Voice of	6175na		
0230	0300	twhfas	Albania, Radio Tirana	6115eu	7455eu	
0230	0300		Hungary, Radio Budapest	9765eu		
0230	0300		Sweden, Radio	6010na		
0245	0300		Myanmar, Radio	9730do		
0250	0300		Vatican City, Vatican Radio	7305am	9610am	

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

0300	0315		Croatia, Croatian Radio	9925na		
0300	0327		Czech Rep, Radio Prague	7345na	9870na	
0300	0330		Egypt, Radio Cairo	7270na		
0300	0330		Myanmar, Radio	9730do		
0300	0330		Philippines, Radio Pilipinas	11885va	15270va	
			17665va			
0300	0330		Thailand, Radio	5890na		
0300	0330		UK, BBC World Service	3255af	6005af	
			6035af	6190af	7160af	9750af
			12035af			
0300	0330		USA, KJES Vado NM	7555na		
0300	0330		USA, Voice of America	4930af	6080af	
			7340af	9885af	12080af	15580af
0300	0330		USA, WBCQ Kennebunk ME	5110na	7415na	
			9330na			
0300	0330		Vatican City, Vatican Radio	9610af		
0300	0350		Turkey, Voice of	5975va	7270va	
0300	0355		South Africa, Channel Africa	5960af		
0300	0400		Anguilla, Caribbean Beacon	6090am		
0300	0400		Australia, ABC NT Alice Springs 4835do			2310irr
0300	0400		Australia, ABC NT Katherine	5025do		
0300	0400		Australia, ABC NT Tennant Creek			4910do
0300	0400		Australia, Radio	9660pa	12080pa	13630pa
			13670va	15240va	15415va	15515va
			17750as	21725va		
0300	0400	twhfas	Canada, CBC NQ SW Service	9625na		
0300	0400		Canada, CFRX Toronto ON	6070do		
0300	0400		Canada, CFVP Calgary AB	6030do		
0300	0400		Canada, CKZN St John's NF	6160do		
0300	0400		Canada, CKZU Vancouver BC	6160do		
0300	0400		China, China Radio Intl	9690na	9790na	
			11870as	15110as		
0300	0400		Costa Rica, University Network			5030va
			6150va	7375va	9725va	
0300	0400		Cuba, Radio Havana	6000na	9820na	
0300	0400		Guyana, Voice of	3291do		
0300	0400		Japan, Radio Japan/NHK World			21610oc
0300	0400		Malaysia, RTM/Trax FM	7295as		
0300	0400		Malaysia, Voice of	6175as	9750as	15295as
0300	0400	vl	Namibia, Namibian BC Corp	3270do	3290do	
			6060do	6175do		
0300	0400		New Zealand, Radio NZ Intl	15720pa		
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		7120va	
0300	0400		Russia, Voice of	9665na	9860na	9880na
			15425na	15455na	15555na	15595na
0300	0400	vl	Rwanda, Radio	6055do		
0300	0400		Singapore, MediaCorp Radio	6150do		
0300	0400		South Africa, Channel Africa	3345af		
0300	0400		Taiwan, Radio Taiwan Intl	5950na	15215sa	
			15310as			
0300	0400		UK, BBC World Service	6195va	9410eu	
			11760me	15575me		
0300	0400	vl/ mtwhf	UK, Sudan Radio Service	7120va		
0300	0400		Ukraine, Radio Ukraine Intl	5810na		
0300	0400		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
0300	0400		USA, KAIJ Dallas TX	5755na		
0300	0400		USA, KTBN Salt Lake City UT	7505na		
0300	0400		USA, KWHR Naalehu HI	17655as		
0300	0400		USA, WBCQ Kennebunk ME	5110na	7415na	
0300	0400		USA, WBOH Newport NC	5920am		
0300	0400		USA, WEWN Birmingham AL	5035va	5835va	
0300	0400		USA, WHRA Greenbush ME	5850na		
0300	0400	twhfa	USA, WHRI Noblesville IN	5860am		
0300	0400	sm	USA, WHRI Noblesville IN	7520am		
0300	0400		USA, WHRI Noblesville IN	5875am	7315am	
0300	0400		USA, WINB Red Lion PA	9265am		
0300	0400	twhfa	USA, WRMI Miami FL	7385am		
0300	0400	sm	USA, WRMI Miami FL	9955am		
0300	0400		USA, WTJC Newport NC	9370na		
0300	0400		USA, WWCR Nashville TN	3215na	5070na	
			5765na	5935na		
0300	0400		USA, WWRB Manchester TN	3185na	5050na	
			5745na	6890na		
0300	0400		USA, WYFR Okeechobee FL	6065am	9505am	
			11740am	15255am		
0300	0400		Uzbekistan, Christian Vision	13685as		
0300	0400		Zambia, Christian Voice	4965af		
0300	0400	vl	Zimbabwe, ZBC Corp	5975do		
0330	0345		Israel, Kol Israel	11590va	13720va	17600va
0330	0357		Czech Rep, Radio Prague	9445va	11600va	
0330	0358		Vietnam, Voice of	6175am		
0330	0400		UK, BBC World Service	3255af	6005af	
			6035af	6190af	7160af	9750af
			12035af	15420af		
0330	0400		USA, Voice of America	4930af	6080af	
			9885af	12080af	12080af	15580af
0330	0400	twhfa	USA, WBCQ Kennebunk ME	9330na		

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

0400	0430	mtwhf	France, Radio France Intl	9805af	11700af	
0400	0430		USA, Voice of America	4930af	4960af	
			6080af	7405af	9575af	9885af
			11835af	12080af	15580af	
0400	0445		USA, WYFR Okeechobee FL	6065va	6855va	

SHORTWAVE GUIDE

			9505va			
0400	0456		Romania, Radio Romania Intl	9780va	11825va	
			15110va	17780va		
0400	0459		South Africa, Channel Africa	3345af		
0400	0500		Anguilla, Caribbean Beacon	6090am		
0400	0500		Australia, ABC NT Alice Springs			2310irr
			4835do			
0400	0500		Australia, ABC NT Katherine	5025do		
0400	0500		Australia, ABC NT Tennant Creek			4910do
0400	0500		Australia, Radio	9660pa	12080pa	13670va
			15240pa	15415va	15515va	21725va
0400	0500	twhfas	Canada, CBC NQ SW Service	9625na		
0400	0500		Canada, CFRX Toronto ON	6070do		
0400	0500		Canada, CKZN St John's NF	6160do		
0400	0500		Canada, CKZU Vancouver BC	6160do		
0400	0500		China, China Radio Intl	6020na	6080na	
			9560na	9755na	11750af	
0400	0500		Costa Rica, University Network			5030va
			6150va	7375va	9725va	
0400	0500		Cuba, Radio Havana	6000na	9820na	
0400	0500		Germany, Deutsche Welle	7225af	9630af	
			12045af	15445af		
0400	0500		Guyana, Voice of	3291do		
0400	0500		Malaysia, RTM/Trax FM	7295as		
0400	0500		Malaysia, Voice of	6175as	9750as	15295as
0400	0500	vl	Namibia, Namibian BC Corp	3270do	3290do	
			6060do	6175do		
0400	0500		New Zealand, Radio NZ Intl	15720pa		
0400	0500		Nigeria, Radio/Kaduna	6090do		
0400	0500	vl	Papua New Guinea, Wantok R.Light		7120va	
0400	0500		Russia, Voice of	9665na	9860na	9880na
			15555na			
0400	0500	vl	Rwanda, Radio	6055do		
0400	0500		Singapore, MediaCorp Radio	6150do		
0400	0500	vl	Uganda, Radio	4976do	5026do	7196do
0400	0500		UK, BBC World Service	3255af	6005af	
			6190af	6195eu	7120af	7160af
			9410va	11760me	12035af	15280as
			15310as	15360as	15420af	15575me
			17760as	17790as	21660as	
0400	0500	DRM	UK, BBC World Service	6010na		
0400	0500	vl/ mtwhf	UK, Sudan Radio Service	7120va		
0400	0500		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
0400	0500		USA, KAIJ Dallas TX	5755na		
0400	0500		USA, KTBN Salt Lake City UT	7505na		
0400	0500		USA, KWHR Naalehu HI	17655as		
0400	0500		USA, WBCQ Kennebunk ME	5110na	7415na	
0400	0500		USA, WBOH Newport NC	5920am		
0400	0500		USA, WEWN Birmingham AL	5035va	5835va	
0400	0500		USA, WHRA Greenbush ME	5850na		
0400	0500	twhfa	USA, WHRI Noblesville IN	5860am		
0400	0500	sm	USA, WHRI Noblesville IN	7520am		
0400	0500		USA, WHRI Noblesville IN	5875am	7315am	
0400	0500	mtwhfa	USA, WMLK Bethel PA	9265eu		
0400	0500	a	USA, WRMI Miami FL	9955am		
0400	0500		USA, WTJC Newport NC	9370na		
0400	0500		USA, WWCR Nashville TN	3215na	5070na	
			5765na	5935na		
0400	0500		USA, WWRB Manchester TN	3185na	5050na	
			5745na	6890na		
0400	0500		USA, WYFR Okeechobee FL	7780va	9715va	
0400	0500		Uzbekistan, Christian Vision	13685as		
0400	0500		Zambia, Christian Voice	4965af		
0400	0500	vl	Zimbabwe, ZBC Corp	5975do		
0400	5000		Netherlands, Radio	6165am	9590va	
0430	0500		Nigeria, Radio/Ibadan	6050do		
0430	0500		Nigeria, Radio/Kaduna	4770do		
0430	0500		Nigeria, Radio/Lagos	3326do	4990do	
0430	0500		Swaziland, TWR	3200af	4775af	
0430	0500		USA, Voice of America	4930af	4960af	
			6080af	7405af	9575af	11835af
			12080af	15580af		
0445	0500		Italy, RAI Intl	6110af	6145af	7235va

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

0500	0507	twhfas	Canada, CBC NQ SW Service	9625na		
0500	0520		Vatican City, Vatican Radio	4005eu	5885eu	
			7250eu	9645eu		
0500	0530	mtwhf	France, Radio France Intl	13680af	15160af	
0500	0530	vl	Rwanda, Radio	6055do		
0500	0530		UK, BBC World Service	6005af	6190af	
			6195eu	7160af	9410af	11765af
			11955as	15280as	15310as	15360as
			15420af	17640af	17760as	17790as
			17885af	21660as		
0500	0530		Vatican City, Vatican Radio	9660af	11625af	
			13765af			
0500	0555		South Africa, Channel Africa	9685af		
0500	0600		Anguilla, Caribbean Beacon	6090am		
0500	0600		Australia, ABC NT Alice Springs			2310irr
			4835do			
0500	0600		Australia, ABC NT Katherine	5025do		
0500	0600		Australia, ABC NT Tennant Creek			4910do
0500	0600		Australia, Radio	9660pa	12080pa	13670va
			15160va	15240va	15415va	15515va
			17750as			
0500	0600		Bhutan, BBS	6035as		
0500	0600		Canada, CFRX Toronto ON	6070do		
0500	0600		Canada, CKZN St John's NF	6160do		
0500	0600		Canada, CKZU Vancouver BC	6160do		
0500	0600		China, China Radio Intl	6020na	6190na	
			9560na	11880as	15350as	15360af
			15465as	17505as	17540as	
0500	0600		Costa Rica, University Network			5030va
			6150va	7375va	9725va	
0500	0600		Cuba, Radio Havana	6000va	6060va	
			9550va	9820va	11760va	
0500	0600		Germany, Deutsche Welle	9630af	9700af	
			15410af	17800af		
0500	0600		Germany, The Voice Africa	9430af		
0500	0600		Guyana, Voice of	3291do		
0500	0600	mtwhf	Italy, IRRS	5775va		
0500	0600		Japan, Radio Japan/NHK World			5975eu
			6110na	7230eu	15195as	17810as
			21755oc			
0500	0600		Malaysia, RTM/Trax FM	7295as		
0500	0600		Malaysia, Voice of	6175as	9750as	15295as
0500	0600	vl	Namibia, Namibian BC Corp	3270do	3290do	
			6060do	6175do		
0500	0600		New Zealand, Radio NZ Intl	15720pa		
0500	0600		Nigeria, Radio/Ibadan	6050do		
0500	0600		Nigeria, Radio/Kaduna	4770do	6090do	
0500	0600		Nigeria, Radio/Lagos	3326do	4990do	
0500	0600		Nigeria, Voice of	15120af		
0500	0600	vl	Papua New Guinea, Wantok R.Light		7120va	
0500	0600		Russia, Voice of	17635oc	21790oc	
0500	0600		Singapore, MediaCorp Radio	6150do		
0500	0600		South Africa, Channel Africa	7240af		
0500	0600		Swaziland, TWR	3200af	4775af	9500af
0500	0600	vl	Uganda, Radio	4976do	5026do	7196do
0500	0600		UK, BBC World Service	11760me	15575me	
0500	0600	vl/ mtwhf	UK, Sudan Radio Service	9525va		
0500	0600		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
0500	0600		USA, KAIJ Dallas TX	5755na		
0500	0600		USA, KTBN Salt Lake City UT	7505na		
0500	0600		USA, KWHR Naalehu HI	11565as	13650as	
0500	0600		USA, Voice of America	4930af	6080af	
			6180af	7405af	12080af	15580af
0500	0600		USA, WBCQ Kennebunk ME	5110na	7415na	
0500	0600		USA, WBOH Newport NC	5920am		
0500	0600		USA, WEWN Birmingham AL	5050va	5850va	
0500	0600		USA, WHRA Greenbush ME	6145na		
0500	0600	twhfa	USA, WHRI Noblesville IN	5860am	7465am	
0500	0600	sm	USA, WHRI Noblesville IN	7315am		
0500	0600	mtwhfa	USA, WMLK Bethel PA	9265eu		
0500	0600	asm	USA, WRMI Miami FL	9955am		
0500	0600		USA, WTJC Newport NC	9370na		
0500	0600		USA, WWCR Nashville TN	3215na	5070na	
			5765na	5935na		
0500	0600		USA, WWRB Manchester TN	3185na		
0500	0600		USA, WYFR Okeechobee FL	6855va	9355va	
0500	0600		Uzbekistan, Christian Vision	13685as		
0500	0600		Zambia, Christian Voice	4965af		
0500	0600	vl	Zimbabwe, ZBC Corp	5975do		
0505	0520	m	Austria, Radio Austria Intl	17870me		
0505	0530	as	Austria, Radio Austria Intl	17870me		
0515	0600		South Africa, The Voice Africa	9555af		
0525	0600	vl	Ghana, Ghana BC Corp	3366do	4915do	
0530	0600		Thailand, Radio	17655eu		
0530	0600		UK, BBC World Service	3255af	6005af	
			6190af	6195eu	7160af	9410af
			11765af	11955as	15310as	15360as
			15420af	17640af	17760as	21660as
0530	0600	mtwhf	UK, BBC World Service	17885af		
0535	0600	as	Austria, Radio Austria Intl	17870me		
0545	0600	twhf	Austria, Radio Austria Intl	17870me		
0545	0600	vl	Rwanda, Radio	6055do		

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

0600	0630	mtwhf	France, Radio France Intl	15160af	17800af	
0600	0630		UK, BBC World Service	6005af	6190af	
			9410af	9530af	11765af	11940af
			12095af	17640af		
0600	0655		South Africa, Channel Africa	15255af		
0600	0659		South Africa, Channel Africa	7240af		
0600	0700		Anguilla, Caribbean Beacon	6090am		

0600 0700 Australia, ABC NT Alice Springs 2310irr 4835do
0600 0700 Australia, ABC NT Katherine 5025do
0600 0700 Australia, ABC NT Tennant Creek 4910do
0600 0700 Australia, CVC International 15335as
0600 0700 Australia, Radio 9660pa 12080pa 13670va 15160va 15240va 15415va 15515va 17750as
0600 0700 Canada, CFRX Toronto ON 6070do
0600 0700 Canada, CFVP Calgary AB 6030do
0600 0700 Canada, CKZN St John's NF 6160do
0600 0700 Canada, CKZU Vancouver BC 6160do
0600 0700 China, China Radio Intl 11870as 11880as 13620as 15350as 15465as 17490eu 17505as 17540as
0600 0700 Costa Rica, University Network 5030va 6150va 7375va 9725va 11870va
0600 0700 Cuba, Radio Havana 6000va 6060va 9550va 9820va 11760va
0600 0700 Germany, Deutsche Welle 6140eu 7170af 15275af 17860af
0600 0700 Germany, The Voice Africa 15640af
0600 0700 vl Ghana, Ghana BC Corp 3366do 4915do
0600 0700 Guyana, Voice of 3291do
0600 0700 Japan, Radio Japan/NHK World 11715eu 11740as 11760eu 13630va 15195as 17870pa 21755oc
0600 0700 Liberia, ELWA 4760do
0600 0700 Malaysia, RTM/Trax FM 7295as
0600 0700 Malaysia, Voice of 6175as 9750as 15295as
0600 0700 vl Namibia, Namibian BC Corp 3270do 3290do 6060do 6175do
0600 0700 Netherlands, Radio 9700pa
0600 0700 New Zealand, Radio NZ Intl 7145pa 15720pa
0600 0700 Nigeria, Radio/Ibadan 6050do
0600 0700 Nigeria, Radio/Kaduna 4770do 6090do
0600 0700 Nigeria, Radio/Lagos 3326do 4990do
0600 0700 Nigeria, Voice of 15120af
0600 0700 vl Papua New Guinea, Wantok R.Light 7120va
0600 0700 Russia, Voice of 17635oc 21790oc
0600 0700 irreg/ vl Sierra Leone, SLBS3316do
0600 0700 Singapore, MediaCorp Radio 6150do
0600 0700 vl Solomon Islands, SIBC 5020do 9545do
0600 0700 South Africa, The Voice Africa 9555af
0600 0700 Swaziland, TWR 3200af 4775af 9500af
0600 0700 as UK, BBC World Service 17885af
0600 0700 UK, BBC World Service 6195eu 9410eu 11955as 12095eu 15310as 15360as 15565eu 15575me 17760as 17790as 21660as
0600 0700 USA, American Forces Radio 4319usb 5446usb 5765usb 6350usb 7590usb 7812usb 10320usb 12133usb 12579usb 13362usb 13855usb
0600 0700 USA, KAIJ Dallas TX 5755na
0600 0700 USA, KTBN Salt Lake City UT 7505na
0600 0700 USA, KWHR Naalehu HI 11565as 13650as
0600 0700 USA, Voice of America 6080af 6180af 7405af 12080af 15580af
0600 0700 USA, WBCQ Kennebunk ME 5110na 7415na
0600 0700 USA, WBOH Newport NC 5920am
0600 0700 USA, WEWN Birmingham AL 5050va 7570va
0600 0700 USA, WHRA Greenbush ME 5860na 7490na
0600 0700 USA, WHRI Noblesville IN 7315am 7465am
0600 0700 mtwhfa USA, WMLK Bethel PA 9265eu
0600 0700 s USA, WRMI Miami FL 9955am
0600 0700 USA, WTJC Newport NC 9370na
0600 0700 USA, WWCR Nashville TN 3215na 5070na 5765na 5935na
0600 0700 USA, WWRB Manchester TN 3185na
0600 0700 USA, WYFR Okeechobee FL 6000va 7780va 9680va 11530va 11580 skd0606
0600 0700 Uzbekistan, Christian Vision 13685as
0600 0700 vl Vanuatu, Radio 4960do
0600 0700 Yemen, Rep of Yemen Radio 9780me
0600 0700 Zambia, Christian Voice 6065af
0600 0700 vl Zimbabwe, ZBC Corp 5975do
0630 0645 Vatican City, Vatican Radio 4005eu 5885eu 6185eu 7250eu 9645eu 11740eu 15595va
0630 0656 Romania, Radio Romania Intl 9655va 11830va 15440va 17770va
0630 0700 Bulgaria, Radio 9500eu 11500eu
0630 0700 UK, BBC World Service 6005af 6190af 9410af 9530af 11765af 11940af 11990af 12095af 17640af
0630 0700 Vatican City, Vatican Radio 11625af 13765af 15570af 15595af
0645 0700 s Albania, TWR Europe 11865eu
0645 0700 s Monaco, TWR 9800eu

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

0700 0715 UK, BBC World Service 6005af 6190af 11940af 11765af 15400af 15485af 17640af 17830af
0700 0727 Czech Rep, Radio Prague 9880eu 11600eu
0700 0730 Slovakia, Radio Slovakia Intl 9440va 15460va
0700 0745 USA, WYFR Okeechobee FL 7780va
0700 0800 smtwhf Albania, TWR Europe 11865eu
0700 0800 Anguilla, Caribbean Beacon 6090am
0700 0800 Australia, ABC NT Alice Springs 2310irr 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, HCJB 11750as
0700 0800 Australia, Radio 9660pa 9710pa 12080pa 13630pa 15160pa 15240va 15415va 17750as
0700 0800 Canada, CFRX Toronto ON 6070do
0700 0800 Canada, CFVP Calgary AB 6030do
0700 0800 Canada, CKZN St John's NF 6160do
0700 0800 Canada, CKZU Vancouver BC 6160do
0700 0800 China, China Radio Intl 11880as 13710eu 15350as 15465as 17490eu
0700 0800 Costa Rica, University Network 5030va 6150va 7375va 9725va 11870va
0700 0800 France, Radio France Intl 17800af
0700 0800 fas Germany, Bible Voice Broadcasting 5945eu
0700 0800 Germany, Deutsche Welle 6140eu
0700 0800 Germany, The Voice Africa 15640af
0700 0800 vl Ghana, Ghana BC Corp 3366do 4915do
0700 0800 Guyana, Voice of 3291do 5950do
0700 0800 Italy, IRRS 13840va
0700 0800 Liberia, ELWA 4760do
0700 0800 Liberia, Star Radio 9525af
0700 0800 Malaysia, RTM/Trax FM 7295as
0700 0800 Malaysia, Voice of 6175as 9750as 15295as
0700 0800 Monaco, TWR 9800eu 11865eu
0700 0800 Myanmar, Radio 9730do
0700 0800 vl Namibia, Namibian BC Corp 3270do 3290do 6060do 6175do
0700 0800 Netherlands, Radio 9700pa
0700 0800 New Zealand, Radio NZ Intl 7145pa
0700 0800 Nigeria, Radio/Ibadan 6050do
0700 0800 Nigeria, Radio/Kaduna 4770do 6090do
0700 0800 Nigeria, Radio/Lagos 3326do 4990do
0700 0800 vl Papua New Guinea, Wantok R.Light 7120va
0700 0800 Russia, Voice of 17495oc 17635oc 21790oc
0700 0800 irreg/ vl Sierra Leone, SLBS3316do
0700 0800 Singapore, MediaCorp Radio 6150do
0700 0800 vl Solomon Islands, SIBC 5020do 9545do
0700 0800 South Africa, The Voice Africa 9555af
0700 0800 Swaziland, TWR 6120af 9500af
0700 0800 Taiwan, Radio Taiwan Intl 5950na
0700 0800 UK, BBC World Service 11955as 15310as 15575me 17760va 17790as 17885as 21660as
0700 0800 USA, American Forces Radio 4319usb 5446usb 5765usb 6350usb 7590usb 7812usb 10320usb 12133usb 12579usb 13362usb 13855usb
0700 0800 USA, KAIJ Dallas TX 5755na
0700 0800 USA, KTBN Salt Lake City UT 7505na
0700 0800 USA, KWHR Naalehu HI 11565as 13650as
0700 0800 USA, WBCQ Kennebunk ME 5110na 7415na
0700 0800 USA, WBOH Newport NC 5920am
0700 0800 USA, WEWN Birmingham AL 5050va 7570va
0700 0800 USA, WHRA Greenbush ME 5860na 7490na
0700 0800 USA, WHRI Noblesville IN 7315am 7495am
0700 0800 mtwhfa USA, WMLK Bethel PA 9265eu
0700 0800 USA, WTJC Newport NC 9370na
0700 0800 USA, WWCR Nashville TN 3215na 5070na 5765na 5935na
0700 0800 USA, WWRB Manchester TN 3185na
0700 0800 USA, WYFR Okeechobee FL 5985va 6855va 9505va 9715va 9930va
0700 0800 vl Vanuatu, Radio 4960do
0700 0800 Zambia, Christian Voice 6065af
0715 0745 s Monaco, TWR 9800eu 11865eu
0715 0750 a Albania, TWR Europe 11865eu
0715 0750 a Monaco, TWR 9800eu 11865eu
0730 0800 sm Guam, TWR/KTWR17570as
0730 0800 Pakistan, Radio 15100eu 17835eu
0730 0800 UK, BBC World Service 6190af 11765af 11940af 15400af 15485af 17640af 17830af
0740 0800 twhfa Guam, TWR/KTWR17570as

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

0800	0820	smtwhf	Albania, TWR Europe	11865eu		
0800	0820		Monaco, TWR	9800eu	11865eu	
0800	0830		Australia, ABC NT Katherine	5025do		
0800	0830		Australia, ABC NT Tennant Creek			4910do
0800	0830		Liberia, ELWA	4760do		
0800	0830		Malaysia, Voice of	6175as	9750as	
0800	0830		Myanmar, Radio	9730do		
0800	0830		Pakistan, Radio	15100eu	17835eu	
0800	0845	fas	Germany, Bible Voice Broadcasting			5945eu
0800	0845		USA, WYFR Okeechobee FL	5950va	9930va	
0800	0900		Anguilla, Caribbean Beacon	6090am		
0800	0900		Australia, ABC NT Alice Springs 4835do			2310irr
0800	0900		Australia, CVC International	15335as		
0800	0900		Australia, HCJB	11750as		
0800	0900		Australia, Radio	5995pa	9580pa	9590pa
			9710pa	12080pa	13630pa	15240va
			15415va	17750as		
0800	0900		Bhutan, BBS	6035as		
0800	0900	DRM	Bulgaria, World Radio Network			13865 ei
0800	0900		Canada, CFRX Toronto ON	6070do		
0800	0900		Canada, CFVP Calgary AB	6030do		
0800	0900		Canada, CKZN St John's NF	6160do		
0800	0900		Canada, CKZU Vancouver BC	6160do		
0800	0900		China, China Radio Intl	11880as	13710eu	
			15350as	15465as	17490eu	17540as
0800	0900		Costa Rica, University Network			5030va
			6150va	7375va	9725va	11870va
0800	0900		Germany, Deutsche Welle	6140eu		
0800	0900		Germany, The Voice Africa	15640af		
0800	0900	vl	Ghana, Ghana BC Corp	3366do		4915do
0800	0900		Guam, TWR/KTWR	11840as	17570as	
0800	0900		Guyana, Voice of	3291do	5950do	
0800	0900		Indonesia, Voice of 15150al		9525as	11785pa
0800	0900	vl	Italy, IRRS	13840va		
0800	0900		Liberia, Star Radio	9525af		
0800	0900		Malaysia, RTM/Trax FM	7295as		
0800	0900		Malaysia, Voice of	15295as		
0800	0900		New Zealand, Radio NZ Intl	7145pa		
0800	0900		Nigeria, Radio/Ibadan	6050do		
0800	0900		Nigeria, Radio/Kaduna	4770do		6090do
0800	0900		Nigeria, Radio/Lagos	3326do		4990do
0800	0900		Papua New Guinea, Catholic Radio			4960do
0800	0900		Papua New Guinea, NBC	4890do		
0800	0900	vl	Papua New Guinea, Wantok R.Light			7120va
0800	0900		Russia, Voice of	17495oc	17635oc	21790oc
0800	0900	DRM	Russia, Voice of	15780eu		
0800	0900	irreg/ vl	Sierra Leone, SLBS	3316do		
0800	0900		Singapore, MediaCorp Radio	6150do		
0800	0900	vl	Solomon Islands, SIBC	5020do		9545do
0800	0900		South Africa, The Voice Africa	9555af		
0800	0900		South Korea, KBS World Radio 9640eu			9570as
0800	0900		Swaziland, TWR	6120af	9500af	
0800	0900		Taiwan, Radio Taiwan Intl	9610as		
0800	0900		UK, BBC World Service	6190af	6195as	
			9740as	11760me	11940af	15310as
			15360as	15400af	15485af	15575me
			17640af	17760as	17790as	17830af
			17885af	21470af	21660as	
0800	0900		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
0800	0900		USA, KAIJ Dallas TX	5755na		
0800	0900		USA, KNLS Anchor Point AK	11765as		
0800	0900		USA, KTBN Salt Lake City UT	7505na		
0800	0900		USA, KWHR Naalehu HI	9930as		11565as
0800	0900		USA, WBOH Newport NC	5920am		
0800	0900		USA, WEWN Birmingham AL	5050na		7570na
0800	0900		USA, WHRA Greenbush ME	5860na		7490na
0800	0900		USA, WHRI Noblesville IN	7315am		7495am
0800	0900		USA, WTJC Newport NC	9370na		
0800	0900		USA, WWCR Nashville TN	3215na		5070na
			5765na	5935na		
0800	0900		USA, WWRB Manchester TN	3185na		
0800	0900		USA, WYFR Okeechobee FL	5985va		6855va
0800	0900	vl	Vanuatu, Radio	4960do		
0800	0900		Zambia, Christian Voice	6065af		
0815	0900	sm	Guam, TWR/KTWR	11840as		
0830	0900		Australia, ABC NT Katherine	2485do		
0830	0900		Australia, ABC NT Tennant Creek			2325do
0830	0900		Lithuania, Radio Vilnius	9710eu		
0845	0900	f	Germany, Bible Voice Broadcasting			17595va

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

0900	0900		USA, WBCQ Kennebunk ME	5110na	7415na	
0900	0915	vl	Ghana, Ghana BC Corp	3366do	4915do	
0900	0927		Czech Rep, Radio Prague	9880eu	21745va	
0900	0930		Guam, TWR/KTWR	11840as		
0900	1000		Anguilla, Caribbean Beacon	6090am		
0900	1000		Australia, ABC NT Alice Springs 4835irr			2310do
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	9580pa	9590pa	11880as
			15240as	15415va		
0900	1000	DRM	Bulgaria, World Radio Network			13865eu
0900	1000		Canada, CFRX Toronto ON	6070do		
0900	1000		Canada, CFVP Calgary AB	6030do		
0900	1000		Canada, CKZN St John's NF	6160do		
0900	1000		Canada, CKZU Vancouver BC	6160do		
0900	1000		China, China Radio Intl 17690oc	15210oc		17490eu
0900	1000		Costa Rica, University Network			5030va
			6150va	7375va	9725va	11870va
			13750va			
0900	1000	f	Germany, Bible Voice Broadcasting			17595va
0900	1000		Germany, Deutsche Welle	6140eu		
0900	1000		Germany, Overcomer Ministries			6110eu
0900	1000		Guyana, Voice of	3291do	5950do	
0900	1000	vl	Italy, IRRS	13840va		
0900	1000		Malaysia, RTM/Trax FM	7295as		
0900	1000		Malaysia, Voice of	15295as		
0900	1000	vl	Namibia, Namibian BC Corp	3270do		3290do
			6060do	6175do		
0900	1000		New Zealand, Radio NZ Intl	7145pa		
0900	1000		Nigeria, Radio/Ibadan	6050do		
0900	1000		Nigeria, Radio/Kaduna	4770do		6090do
0900	1000		Nigeria, Radio/Lagos	3326do		4990do
0900	1000		Papua New Guinea, Catholic Radio			4960do
0900	1000		Papua New Guinea, NBC	4890do		
0900	1000	vl	Papua New Guinea, Wantok R.Light			7120va
0900	1000	vl	Rwanda, Radio	6055do		
0900	1000	irreg/ vl	Sierra Leone, SLBS	3316do		
0900	1000		Singapore, MediaCorp Radio	6150do		
0900	1000	vl	Solomon Islands, SIBC	5020do		9545do
0900	1000		South Africa, The Voice Africa	9555af		
0900	1000		UK, BBC World Service	6190af	6195as	
			9605as	9740as	11940af	15310as
			15360as	15400af	15485af	17640af
			17760as	17830af	17885af	21470af
0900	1000		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
0900	1000		USA, KAIJ Dallas TX	5755na		
0900	1000		USA, KTBN Salt Lake City UT	7505na		
0900	1000		USA, KWHR Naalehu HI	9930as		11565as
0900	1000		USA, WBCQ Kennebunk ME	5110na		7415na
0900	1000		USA, WBOH Newport NC	5920am		
0900	1000		USA, WEWN Birmingham AL	5050na		
0900	1000		USA, WHRI Noblesville IN	7315am		7520am
0900	1000		USA, WTJC Newport NC	9370na		
0900	1000		USA, WWCR Nashville TN	5070na		5765na
			5935na	9985na		
0900	1000		USA, WWRB Manchester TN	3185na		
0900	1000		USA, WYFR Okeechobee FL	5985va		6885va
			9755va			
0900	1000	vl	Vanuatu, Radio	4960do		
0900	1000		Zambia, Christian Voice	6065af		
0905	1000	s	Greece, Voice of	9420va	12120va	15630eu
0930	0945		Israel, Kol Israel	13680eu	15760eu	

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

1000	1015	f	Germany, Bible Voice Broadcasting			17595va
1000	1015	as	USA, WRMI Miami FL	9955am		
1000	1030		Mongolia, Voice of	12085as		
1000	1030		UK, BBC World Service	6195as	9690as	
			9740as	15310as	15360as	17760as
			17790as	21660as		
1000	1059		New Zealand, Radio NZ Intl	7145pa		
1000	1100		Anguilla, Caribbean Beacon	11775am		
1000	1100		Australia, ABC NT Alice Springs 4835irr			2310do
1000	1100		Australia, ABC NT Katherine	2485do		
1000	1100		Australia, ABC NT Tennant Creek			2325do
1000	1100		Australia, CVC International	11955as		
1000	1100		Australia, HCJB	15400as	15540as	
1000	1100		Australia, Radio	9580pa	9590pa	11880as
			15240as	15415va		
1000	1100		Austria, CVC International	11815eu		
1000	1100	DRM	Bulgaria, World Radio Network			13865eu
1000	1100		Canada, CFRX Toronto ON	6070do		
1000	1100		Canada, CFVP Calgary AB	6030do		
1000	1100		Canada, CKZN St John's NF	6160do		
1000	1100		Canada, CKZU Vancouver BC	6160do		
1000	1100		China, China Radio Intl	6040na	17490eu	

1000	1100		Costa Rica, University Network				5030va
			6150va	7375va	9725va		11870va
			13750va				
1000	1100		Germany, Overcomer Ministries				6110eu
1000	1100		Guyana, Voice of	3291do	5950do		
1000	1100		India, All India Radio			13695oc	15020as
			15410as	17510as	17800as		17895oc
1000	1100	vl	Italy, IRRS	13840va			
1000	1100		Japan, Radio Japan/NHK World				6120na
			9695as	11730as	17585va		17720me
			21755oc				
1000	1100		Malaysia, RTM/Trax FM		7295as		
1000	1100		Malaysia, Voice of	15295as			
1000	1100		Netherlands, Radio			12065as	13710as
			13820as				
1000	1100	DRM	Netherlands, Radio		7240eu		
1000	1100		Nigeria, Voice of	7255af			
1000	1100		North Korea, Voice of Korea			6185as	6285am
			9335ca	9850as			
1000	1100		Papua New Guinea, Catholic Radio				4960do
1000	1100		Papua New Guinea, NBC		4890do		
1000	1100	vl	Papua New Guinea, Wantok R.Light				7120va
1000	1100		Singapore, MediaCorp Radio		6150do		
1000	1100	vl	Solomon Islands, SIBC		5020do		9545do
1000	1100		South Africa, Channel Africa		9620af		
1000	1100		South Africa, The Voice Africa		9555af		
1000	1100		UK, BBC World Service			6190af	11940af
			15485af	15575me			
1000	1100	as	UK, BBC World Service		15400af		
1000	1100		USA, American Forces Radio			4319usb	5446usb
			5765usb	6350usb	7590usb		7812usb
			10320usb	12133usb	12579usb		13362usb
			13855usb				
1000	1100		USA, KAIJ Dallas TX		5755na		
1000	1100		USA, KNLS Anchor Point AK		9795as		
1000	1100		USA, KTBN Salt Lake City UT		7505na		
1000	1100		USA, KWHR Naalehu HI		9930as		11565as
1000	1100		USA, WBCQ Kennebunk ME		5110na		7415na
1000	1100		USA, WBOH Newport NC		5920am		
1000	1100		USA, WEWN Birmingham AL		5050na		
1000	1100		USA, WHRI Noblesville IN		7520am		7555am
1000	1100		USA, WINB Red Lion PA		9265am		
1000	1100		USA, WTJC Newport NC		9370na		
1000	1100		USA, WWCR Nashville TN		5070na		5765na
			5935na	15825na			
1000	1100		USA, WWRB Manchester TN		3185na		
1000	1100		USA, WYFR Okeechobee FL		5950va		5985va
			6855va	9755va			
1000	1100		Zambia, Christian Voice		6065af		
1030	1045	mtwhf	Ethiopia, Radio	5990af	7110af		9704af
1030	1057		Czech Rep, Radio Prague		9880eu		11665va
1030	1058		Vietnam, Voice of	7285as			
1030	1100		Iran, Voice of the Islamic Rep			15600as	17660as
1030	1100		UK, BBC World Service		6195as		9740as
			15310as	17760as	17790as		

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

1100	1128		Vietnam, Voice of	9840as	7220as		7285as
1100	1130		Australia, HCJB	15540as			
1100	1130		Australia, Radio	5995pa	9475va		9590va
			9580pa	9590pa	11880va		15240va
1100	1130		Iran, Voice of the Islamic Rep			15600as	17660as
1100	1130		UK, BBC World Service			6190af	11940af
			15400af	15485af	17640af		17830af
			17885af	21470af			
1100	1145		USA, WYFR Okeechobee FL		9550va		9755va
1100	1159	s	Germany, Universal Life		6055me		
1100	1200		Anguilla, Caribbean Beacon		11775am		
1100	1200		Australia, ABC NT Alice Springs				2310do
			4835irr				
1100	1200		Australia, ABC NT Katherine		2485do		
1100	1200		Australia, ABC NT Tennant Creek				2325do
1100	1200		Australia, CVC International		13635as		
1100	1200	DRM	Bulgaria, World Radio Network				13865eu
1100	1200	as	Canada, CBC NQ SW Service		9625na		
1100	1200		Canada, CFRX Toronto ON		6070do		
1100	1200		Canada, CFVP Calgary AB		6030do		
1100	1200		Canada, CKZN St John's NF		6160do		
1100	1200		Canada, CKZU Vancouver BC		6160do		
1100	1200		China, China Radio Intl			6040na	11750na
			13650eu	17490eu			
1100	1200		Costa Rica, University Network				5030va
			6150va	7375va	9725va		11870va
			13750va				
1100	1200	vl	Italy, IRRS	13840va			
1100	1200		Japan, Radio Japan/NHK World				6120na
			9695as	11730as			
1100	1200	vl	Libya, Voice of Africa			17725af	21695af
1100	1200		Malaysia, RTM/Trax FM		7295as		
1100	1200		Malaysia, Voice of	15295as			
1100	1200		Netherlands, Radio		11675na		
1100	1200		New Zealand, Radio NZ Intl		9870pa		
1100	1200		Nigeria, Voice of	7255af			
1100	1200		Papua New Guinea, Catholic Radio				4960do
1100	1200		Papua New Guinea, NBC		4890do		
1100	1200	vl	Papua New Guinea, Wantok R.Light				7120va
1100	1200		Singapore, Radio Singapore Intl				6080as
			6150as				
1100	1200		South Africa, Channel Africa		9620af		
1100	1200		South Africa, The Voice Africa		9555af		
1100	1200		Taiwan, Radio Taiwan Intl		7445as		
1100	1200		UK, BBC World Service			6195as	9740as
			11865va	15310as	15575me		17760as
			17790as				
1100	1200		Ukraine, Radio Ukraine Intl		9950eu		
1100	1200		USA, American Forces Radio			4319usb	5446usb
			5765usb	6350usb	7590usb		7812usb
			10320usb	12133usb	12579usb		13362usb
			13855usb				
1100	1200		USA, KAIJ Dallas TX		5755na		
1100	1200		USA, KTBN Salt Lake City UT		7505na		
1100	1200		USA, KWHR Naalehu HI		9930as		11565as
1100	1200		USA, Voice of America		15205va		
1100	1200		USA, WBOH Newport NC		5920am		
1100	1200		USA, WEWN Birmingham AL		5050na		
1100	1200		USA, WHRI Noblesville IN		7520am		7555am
1100	1200		USA, WINB Red Lion PA		9265am		
1100	1200		USA, WTJC Newport NC		9370na		
1100	1200		USA, WWCR Nashville TN		5070na		5765na
			5935na	15825na			
1100	1200		USA, WWRB Manchester TN		3185na		
1100	1200		USA, WWRB Manchester TN		3185na		
1100	1200		USA, WYFR Okeechobee FL		5950va		5985va
			7780va	9625va			
1100	1200		Zambia, Christian Voice		6065af		
1115	1200	s	USA, WRMI Miami FL		9955am		
1130	1159	a	Germany, Universal Life		6055me		
1130	1200	mtwhfa	Australia, HCJB	15425as			
1130	1200		Australia, Radio	5995pa	9475va		9590va
			9580pa	9590pa	11880va		
1130	1200		Bulgaria, Radio	11700eu	15700eu		
1130	1200		Guam, AWR/KSDA		15435as		
1130	1200		UK, BBC World Service		6190af		11940af
			15485af	17640af	17830af		17885af
			21470af				
1130	1200		Vatican City, Vatican Radio		15595va		17515va

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

1200	1215	vl	Cambodia, National Radio		11940as		
1200	1230		France, Radio France Intl		17815af		21620af
1200	1230		Malaysia, Voice of	15295as			
1200	1230		UAE, AWR Africa	15365as			
1200	1245		USA, WYFR Okeechobee FL		5950am		5985am
1200	1259		Canada, Radio Canada Intl		9660as		15170as
1200	1259		New Zealand, Radio NZ Intl		9870pa		
1200	1259		Poland, Radio Polonia		9525eu		11850eu
1200	1300		Anguilla, Caribbean Beacon		11775am		
1200	1300		Australia, ABC NT Alice Springs				2310do
			4835irr				
1200	1300		Australia, ABC NT Katherine		2485do		
1200	1300		Australia, ABC NT Tennant Creek				2325do
1200	1300		Australia, CVC International		13635as		
1200	1300		Australia, Radio	5995pa	9475va		9590va
			9580pa	9590pa	11880va		
1200	1300	DRM	Bulgaria, World Radio Network				13865eu
1200	1300	as	Canada, CBC NQ SW Service		9625na		
1200	1300		Canada, CFRX Toronto ON		6070do		
1200	1300		Canada, CFVP Calgary AB		6030do		
1200	1300		Canada, CKZN St John's NF		6160do		
1200	1300		Canada, CKZU Vancouver BC		6160do		
1200	1300		China, China Radio Intl		9730as		9760oc
			11760oc	11980as	13650eu		13790eu
			17490eu	17625af			
1200	1300		Costa Rica, University Network				9725va
			11870va	13750va			
1200	1300		Germany, Overcomer Ministries				6110eu
1200	1300	vl	Italy, IRRS	13840va			
1200	1300	vl	Libya, Voice of Africa			17670af	17675af
			17680af	21695af			
1200	1300		Malaysia, RTM/Trax FM		7295as		
1200	1300		Malaysia, Voice of	6175as			
1200	1300	DRM	Netherlands, Radio		7240eu		
1200	1300		Nigeria, Voice of	7255af			
1200	1300		Papua New Guinea, Catholic Radio				4960do
1200	1300		Papua New Guinea, NBC		4890do		
1200	1300	vl	Papua New Guinea, Wantok R.Light				7120va
1200	1300		Singapore, Radio Singapore Intl				6080as
			6150as				
1200	1300		South Africa, The Voice Africa		9555af		
1200	1300		South Korea, KBS World Radio				9650na
1200	1300		Taiwan, Radio Taiwan Intl		7130na		
1200	1300		UK, BBC World Service		6190af		6195as

SHORTWAVE GUIDE

			9740as	11865va	11940af	15310as	
			15485af	15575me	17640af	17760as	
			17790as	17830af	17885af	21470af	
1200	1300		USA, American Forces Radio		4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb	
			10320usb	12133usb	12579usb	13362usb	
			13855usb				
1200	1300		USA, KAIJ Dallas TX		5755na		
1200	1300		USA, KNLS Anchor Point AK		9615as	9780as	
1200	1300		USA, KTBN Salt Lake City UT		7505na		
1200	1300		USA, KWHR Naalehu HI		11565as	12130as	
1200	1300		USA, Voice of America		6160va	9645va	
			9760va	11750va			
1200	1300		USA, WBOH Newport NC		5920am		
1200	1300		USA, WEWN Birmingham AL		5050na		
1200	1300		USA, WHRA Greenbush ME		15665na		
1200	1300		USA, WHRI Noblesville IN		9495am	9840am	
			12050am				
1200	1300		USA, WINB Red Lion PA		13570am		
1200	1300		USA, WTJC Newport NC		9370na		
1200	1300		USA, WWCR Nashville TN		7465na	9985na	
			13845na	15825na			
1200	1300		USA, WWRB Manchester TN		3185na		
1200	1300		USA, WYFR Okeechobee FL		17555am	17750am	
1200	1300		Zambia, Christian Voice		6065af		
1205	1220	m	Austria, Radio Austria Intl		6155eu	13730eu	
			17715va				
1205	1230	as	Austria, Radio Austria Intl		6155eu	13730eu	
			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	15450eu	15535va		
1235	1300	as	Austria, Radio Austria Intl		6155eu	13730eu	
			17715va				
1245	1300	m	Austria, Radio Austria Intl		17715va		
1245	1300	twhf	Austria, Radio Austria Intl		6155eu	13730eu	
			17715va				
1255	1258		Finland, YLE/Radio Finland		13715do	15400do	

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

1300	1315	w	Australia, HCJB	15405as			
1300	1320		Turkey, Voice of	15450eu	15535oc		
1300	1327		Czech Rep, Radio Prague		13580as	17540na	
1300	1330		Australia, HCJB	15400as			
1300	1330		Egypt, Radio Cairo	17835as			
1300	1330	DRM	Netherlands, Radio		7240eu		
1300	1356		Romania, Radio Romania Intl		11830eu	15105eu	
1300	1400		Anguilla, Caribbean Beacon		11775am		
1300	1400		Australia, CVC International		13635as		
1300	1400		Australia, Radio	5995pa	6020pa	9560pa	
			9580pa	9590pa			
1300	1400	DRM	Bulgaria, World Radio Network			13865eu	
1300	1400	as	Canada, CBC NQ SW Service		9625na		
1300	1400		Canada, CFRX Toronto ON		6070do		
1300	1400		Canada, CFVP Calgary AB		6030do		
1300	1400		Canada, CKZN St John's NF		6160do		
1300	1400		Canada, CKZU Vancouver BC		6160do		
1300	1400		Canada, Radio Canada Intl		9515am	13655am	
			17800am				
1300	1400		China, China Radio Intl		9570na	9650pa	
			11760oc	11900oc	11980as	13790eu	
			15260na	17490eu			
1300	1400		Costa Rica, University Network			9725va	
			11870va	13750va			
1300	1400		Germany, Deutsche Welle		6140eu		
1300	1400		Germany, Overcomer Ministries			6110eu	
1300	1400	mtwhf	Italy, IRRS	13840va			
1300	1400	as	Italy, IRRS	15740va			
1300	1400		Jordan, Radio	11690na			
1300	1400	vl	Libya, Voice of Africa		17690af	17675af	
			17680af	21695af			
1300	1400		Malaysia, RTM/Trax FM		7295as		
1300	1400		Malaysia, Voice of	6175as			
1300	1400		New Zealand, Radio NZ Intl		7145pa		
1300	1400		Nigeria, Voice of	7255af			
1300	1400		North Korea, Voice of Korea		7570eu	9335na	
			11710na	12015eu			
1300	1400		Papua New Guinea, Catholic Radio			4960do	
1300	1400		Papua New Guinea, NBC		4890do		
1300	1400	vl	Papua New Guinea, Wantok R.Light			7120va	
1300	1400		Singapore, Radio Singapore Intl			6080as	
			6150as				
1300	1400		South Africa, The Voice Africa		9555af		
1300	1400		South Korea, KBS World Radio			9570na	
			9770na				
1300	1400		UK, BBC World Service		6190af	6195as	
			9740as	11760me	11940af	12095eu	
			15310as	15420af	15485af	15565eu	
			15575me	17640va	17760as	17790as	
			17830af	17885af	21470af		
1300	1400		USA, American Forces Radio		4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb	
			10320usb	12133usb	12579usb	13362usb	
			13855usb				
1300	1400		USA, KAIJ Dallas TX		5755na		
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 Kennebunk ME		9330na		
1300	1400		USA, WBOH Newport NC		5920am		
1300	1400		USA, WEWN Birmingham AL		5050na		
1300	1400		USA, WHRA Greenbush ME		15665na		
1300	1400		USA, WHRI Noblesville IN		9840am	11785am	
			12050am				
1300	1400		USA, WINB Red Lion PA		13570am		
1300	1400		USA, WTJC Newport NC		9370na		
1300	1400		USA, WWCR Nashville TN		7465na	9985na	
			13845na	15825na			
1300	1400		USA, WWRB Manchester TN		9385na		
1300	1400		USA, WYFR Okeechobee FL		11520va	11560va	
			11830va	11865va	11910va	17750va	
1300	1400		Zambia, Christian Voice		6065af		
1330	1400	s	Australia, HCJB	15435as			
1330	1400	twhfa	Guam, AWR/KSDA		15275as		
1330	1400		Guam, TWR/KTWR	9585as			
1330	1400		India, All India Radio		9690as	11620as	
			13710as				
1330	1400		Laos, National Radio		7145as		
1330	1400		Sweden, Radio	15240na	15735va		

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

1400	1415	th	Germany, Pan American BC		15205me		
1400	1415		Russia, FEBA	9500as			
1400	1430		Australia, Radio	5995pa	6080pa	7420va	
			9590pa	11750as			
1400	1430	DRM	Canada, Radio Canada Intl		9815eu		
1400	1430		Thailand, Radio	9830va			
1400	1500		Anguilla, Caribbean Beacon		11775am		
1400	1500		Australia, CVC International		13635as		
1400	1500	DRM	Bulgaria, World Radio Network			11540eu	
1400	1500	as	Canada, CBC NQ SW Service		9625na		
1400	1500		Canada, CFRX Toronto ON		6070do		
1400	1500		Canada, CFVP Calgary AB		6030do		
1400	1500		Canada, CKZN St John's NF		6160do		
1400	1500		Canada, CKZU Vancouver BC		6160do		
1400	1500		Canada, Radio Canada Intl		9515am	13655am	
			17800am				
1400	1500		China, China Radio Intl		6100af	9560as	
			11675as	11765as	11775as	13685af	
			13710na	13740na	13790na	17490eu	
			17650eu				
1400	1500		Costa Rica, University Network			9725va	
			11870va	13750va			
1400	1500		France, Radio France Intl		21620as		
1400	1500	as	Germany, Bible Voice Broadcasting			15690as	
1400	1500		Germany, Deutsche Welle		6140eu		
1400	1500		Germany, Overcomer Ministries			13810va	
1400	1500	a	Greece, Voice of	9420va	9775va	12105va	
			15630va				
1400	1500		Guam, TWR/KTWR	9975as			
1400	1500		India, All India Radio		9690as	11620as	
			13710as				
1400	1500	mtwhf	Italy, IRRS	13840va			
1400	1500	as	Italy, IRRS	9310va	15740va		
1400	1500		Japan, Radio Japan/NHK World			7200as	
			11730as	11840oc			
1400	1500		Jordan, Radio	11690na			
1400	1500		Libya, Voice of Africa		17725af	17850af	
1400	1500		Malaysia, RTM/Trax FM		7295as		
1400	1500		Malaysia, Voice of	6175as			
1400	1500		Netherlands, Radio		9345as	9890as	
			11835as				
1400	1500		New Zealand, Radio NZ Intl		7145pa		
1400	1500		Nigeria, Voice of	7255af			
1400	1500		Oman, Radio Oman		15140as		
1400	1500	vl	Papua New Guinea, Wantok R.Light			7120va	
1400	1500		Russia, Voice of	7165eu	7370as	9745as	
			11755as	12055as	15605as	17645as	
1400	1500		Singapore, MediaCorp Radio		6150do		
1400	1500		South Africa, The Voice Africa		9555af		
1400	1500		Taiwan, Radio Taiwan Intl		15265as		
1400	1500		UK, BBC World Service		6190af	6195as	
			9740as	11940af	15310as	12095eu	
			15485va	15565eu	15575me	17640va	
			17760as	17790as	17830af	21470af	
			21660af				
1400	1500		USA, American Forces Radio		4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb	

			10320usb	12133usb	12579usb	13362usb
			13855usb			
1400	1500		USA, KAIJ Dallas TX		13815na	
1400	1500		USA, KJES Vado NM		11715na	
1400	1500		USA, KNLS Anchor Point AK		9795as	
1400	1500		USA, KTBN Salt Lake City UT		7505na	
1400	1500		USA, KWHR Naalehu HI		9930as	
1400	1500		USA, Voice of America		4930af	6080af
			7125va	9760va	13795af	15185af
			15490af	15580af	17720af	17730af
1400	1500		USA, WBCQ Kennebunk ME		9330na	
1400	1500		USA, WBOH Newport NC		5920am	
1400	1500		USA, WEWN Birmingham AL		9955na	
1400	1500		USA, WHRA Greenbush ME		17650na	
1400	1500		USA, WHRI Noblesville IN		9840am	11785am
			12050am			
1400	1500		USA, WINB Red Lion PA		13570am	
1400	1500		USA, WRMI Miami FL		7385am	
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 Okeechobee FL		11520va	11560va
			11830va	11910va	13695va	17750va
1400	1500		Zambia, Christian Voice		6065af	
1400	2500		South Africa, Channel Africa		9620af	
1415	1430		Nepal, Radio	3230as	5005as	6100as
			7165as			
1430	1445	s	Germany, Pan American BC		15205as	15650as
1430	1500		Australia, Radio	5995pa	6080pa	7420va
			9475pa	9590pa	11660va	11750va
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	fs	Germany, Bible Voice Broadcasting			13840as
1500	1530	s	Hungary, Radio Budapest		6025eu	9690eu
1500	1530		Mongolia, Voice of	12015eu		
1500	1530		UK, BBC World Service		9695af	11690af
			11940af	15400af	15420af	15485af
			17640af	17830af	21470af	21660af
1500	1545		Russia, FEBA	7320as		
1500	1545		South Africa, The Voice Africa		9555af	
1500	1545		USA, WYFR Okeechobee FL		15770va	
1500	1555	mtwhf	Italy, IRRS	13840va		
1500	1555		South Africa, Channel Africa		17770af	
1500	1557		Canada, Radio Canada Intl		11675as	15360as
			17720as			
1500	1557		Libya, Voice of Africa		17725af	17850af
1500	1559		Canada, Radio Canada Intl		9515as	13655as
			17800as			
1500	1559		South Africa, Channel Africa		9620af	
1500	1600		Anguilla, Caribbean Beacon		11775am	
1500	1600		Australia, CVC International		13635as	
1500	1600		Australia, Radio	5995pa	6080pa	7420va
			9475pa	9590pa	11660va	11750va
1500	1600	DRM	Bulgaria, World Radio Network			11540eu
1500	1600	as	Canada, CBC NQ SW Service		9625na	
1500	1600		Canada, CFRX Toronto ON		6070do	
1500	1600		Canada, CFVP Calgary AB		6030do	
1500	1600		Canada, CKZN St John's NF		6160do	
1500	1600		Canada, CKZU Vancouver BC		6160do	
1500	1600		China, China Radio Intl		6100af	7160as
			9785as	11965eu	13640eu	13685af
			13740na	17490eu		
1500	1600		Costa Rica, University Network			9725va
			11870va	13750va		
1500	1600		France, Radio France Intl		17850af	
1500	1600		Germany, Deutsche Welle		6140eu	
1500	1600		Germany, Overcomer Ministries			13810va
1500	1600		Germany, The Voice Africa		15715af	
1500	1600		Italy, IRRS	9310eu		
1500	1600		Japan, Radio Japan/NHK World			6190as
			7200as	9505va	11730as	
1500	1600		Jordan, Radio	11690na		
1500	1600		Malaysia, RTM/Trax FM		7295as	
1500	1600		Malaysia, Voice of	6175as		
1500	1600		Netherlands, Radio		9345as	9890as
			11835as			
1500	1600		New Zealand, Radio NZ Intl		7145pa	
1500	1600		North Korea, Voice of Korea		7570eu	9335na
			11710na	12015eu		
1500	1600	vl	Papua New Guinea, Wantok R.Light			7120va
1500	1600		Russia, Voice of	4965me	4975me	7300eu
			9660as	12040eu	15455eu	
1500	1600		Singapore, MediaCorp Radio		6150do	
1500	1600		UK, BBC World Service		5975as	6195as
			9740as	11750as	12095eu	15310as
			15485eu	15565eu	17640va	17790as
1500	1600	vl/ mtwhf	UK, Sudan Radio Service		15575va	
1500	1600		USA, American Forces Radio		4319usb	5446usb
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
1500	1600		USA, KAIJ Dallas TX		13815na	
1500	1600		USA, KJES Vado NM		11715na	
1500	1600		USA, KTBN Salt Lake City UT		7505na	
1500	1600		USA, KWHR Naalehu HI		9930as	
1500	1600		USA, Voice of America		4930af	6160va
			7125af	7405va	9590va	12040va
			12150af	13795va	15105va	15195va
			15445va	15550af	15580af	17895af
1500	1600		USA, WBCQ Kennebunk ME		9330na	
1500	1600		USA, WBOH Newport NC		5920am	
1500	1600		USA, WEWN Birmingham AL		9955na	
1500	1600		USA, WHRA Greenbush ME		17650na	
1500	1600		USA, WHRI Noblesville IN		9840am	11785am
			13760am			
1500	1600		USA, WINB Red Lion PA		13570am	
1500	1600	smtwhf	USA, WMLK Bethel PA		9265eu	
1500	1600		USA, WRMI Miami FL		7385am	
1500	1600		USA, WTJC Newport NC		9370na	
1500	1600		USA, WWCR Nashville TN		9985na	12160na
			13845na	15825na		
1500	1600		USA, WWRB Manchester TN		9385na	11915na
1500	1600		USA, WYFR Okeechobee FL		6280va	11830va
			11910va	15750af	17750va	
1500	1600		Zambia, Christian Voice		4965af	
1500	1600	f DRM	Taiwan, Radio Taiwan Intl		9770eu	
1505	1520	m	Austria, Radio Austria Intl		13755am	
1505	1530	as	Austria, Radio Austria Intl		13775am	
1515	1530	twhf	Austria, Radio Austria Intl		13775am	
1530	1600	mtwhf	Germany, Bible Voice Broadcasting			13840as
1530	1600		Iran, Voice of the Islamic Rep		7350as	9635as
			11650al			
1530	1600	a	Pakistan, Radio	4790as		
1530	1600		UAE, AWR Africa	15225as		
1530	1600		UK, BBC World Service		6190af	11940af
			15400af	15485af	17640af	17830af
			21470af	21660af		
1530	1600		Vatican City, Vatican Radio		12065va	13765va
			15235va			
1535	1600	as	Austria, Radio Austria Intl		13775am	
1545	1600	mtwhf	Austria, Radio Austria Intl		13775am	
1545	1600	s	Germany, Pan American BC		15650me	

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

1600	1640	vl/mtwhf	Moldova, Radio Pridnestrovye		5910eu	
1600	1615	f	Armenia, FEBA	9850as		
1600	1615		Pakistan, Radio	4790va	5022va	9375va
			111570va	12105va	15725va	
1600	1615		UK, BBC World Service		3255af	6190af
			12095af	15105af	15400af	15485af
			17830af	17885af	21470af	21660af
1600	1627		Czech Rep, Radio Prague		5930eu	17485af
1600	1628		Vietnam, Voice of	7280va	9550va	9730va
			11630va	13860va		
1600	1630	sh	Germany, Pan American BC		15650me	
1600	1630		Guam, AWR/KSDA		11640as	11680as
1600	1630		Iran, Voice of the Islamic Rep		7350as	9635as
			11650al			
1600	1630		Jordan, Radio	11690na		
1600	1630		Myanmar, Radio	9730do		
1600	1645		USA, WYFR Okeechobee FL		11830va	11865va
			17750va			
1600	1650		New Zealand, Radio NZ Intl		7145pa	
1600	1700		Anguilla, Caribbean Beacon		11775am	
1600	1700		Australia, CVC International		13635as	
1600	1700		Australia, Radio	5995pa	6080pa	7240va
			9475pa	9710pa	11660as	
1600	1700	DRM	Bulgaria, World Radio Network			11540eu
1600	1700	a	Canada, CBC NQ SW Service		9625na	
1600	1700		Canada, CFRX Toronto ON		6070do	
1600	1700		Canada, CFVP Calgary AB		6030do	
1600	1700		Canada, CKZN St John's NF		6160do	
1600	1700		Canada, CKZU Vancouver BC		6160do	
1600	1700		China, China Radio Intl		6100af	9570af
			11900af	11940eu	11865eu	13760eu
			17490eu			
1600	1700		Costa Rica, University Network			11870va
			13750va			
1600	1700		Egypt, Radio Cairo		11740af	
1600	1700		Ethiopia, Radio	5990af	7110af	7165af
			9560af	9704af	11800af	
1600	1700		France, Radio France Intl		7170af	11615af
			15160af	15605af	17605af	
1600	1700		Germany, Bible Voice Broadcasting			13590me
1600	1700		Germany, Deutsche Welle		6170as	9485as
			17595as			
1600	1700		Germany, The Voice Africa		15715af	

1600	1700		Italy, IRRS	5785va	9310va	
1600	1700	DRM	Japan, Radio Japan/NHK World			9770eu
1600	1700		Malaysia, RTM/Trax FM		7295as	
1600	1700		Malaysia, Voice of	6175as		
1600	1700		North Korea, Voice of Korea		9990va	11545va
1600	1700	vl	Papua New Guinea, Wantok R.Light			7120va
1600	1700		Russia, Voice of	6070as	7320eu	9405as
			11755as	11985af	12055va	12115as
			15540me			
1600	1700		South Korea, KBS World Radio			5975va
1600	1700		Swaziland, TWR	6130af		
1600	1700		Taiwan, Radio Taiwan Intl		11550as	
1600	1700		UK, BBC World Service		3915as	5975as
			6195as	7160as	9510as	11955as
			12095va	15485eu	15565eu	17790va
1600	1700	vl/ mtwhf	UK, Sudan Radio Service		15575va	
1600	1700		USA, American Forces Radio		4319usb	5446usb
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
1600	1700		USA, KAIJ Dallas TX		13815na	
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	7405af
			15195va	12080af	13600va	15410af
			15445va	15580af	17895af	
1600	1700		USA, WBCQ Kennebunk ME		9330na	
1600	1700		USA, WBOH Newport NC		5920am	
1600	1700		USA, WEWN Birmingham AL		13615na	
1600	1700		USA, WHRA Greenbush ME		17640na	
1600	1700		USA, WHRI Noblesville IN		9840am	13760am
			15285am			
1600	1700		USA, WINB Red Lion PA		13570am	
1600	1700	smtwhf	USA, WMLK Bethel PA		9265eu	
1600	1700		USA, WTJC Newport NC		9370na	
1600	1700		USA, WWCR Nashville TN		9985na	12160na
			13845na	15825na		
1600	1700		USA, WWRB Manchester TN		9385na	11915na
1600	1700		USA, WYFR Okeechobee FL		6085va	6085va
			13695va	18980va	21455va	2525va
1600	1700		Zambia, Christian Voice		4965af	
1615	1630		Vatican City, Vatican Radio		4005eu	5885eu
			7250eu	9645eu	15595va	
1615	1700		UK, BBC World Service		3255af	6190af
			12095af	15105af	15420af	15485af
			17830af	17885af	21470af	21660af
1615	1700	as	UK, BBC World Service		9695af	11690af
1630	1700	t	Germany, Bible Voice Broadcasting			13580me
1630	1700	as	Germany, Bible Voice Broadcasting			9430me
1630	1700		Guam, AWR/KSDA		11975as	
1630	1700		Slovakia, Radio Slovakia Intl		5920eu	6055eu
1640	1650	mtwhfa	Turkmenistan, Turkmen Radio		4930eu	
1651	1700		New Zealand, Radio NZ Intl		7145pa	

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

1700	1727		Czech Rep, Radio Prague		5930eu	17485va
1700	1730		France, Radio France Intl		15605af	17605af
1700	1730	mtwhf	Germany, Bible Voice Broadcasting			13580me
1700	1745		UK, BBC World Service		3255af	6005af
			6190af	9630af	9740as	11945af
			12095va	15105af	15400af	
			17830af	17885af	21470af	
1700	1755		Italy, IRRS	9310va		
1700	1755		South Africa, Channel Africa		15235af	
1700	1759		Poland, Radio Polonia		7220eu	7265eu
1700	1800		Anguilla, Caribbean Beacon		11775am	
1700	1800		Australia, CVC International		13635as	
1700	1800		Australia, Radio	5995pa	6080pa	9475va
			9580pa	9710pa	11880pa	
1700	1800	DRM	Bulgaria, World Radio Network			11540eu
1700	1800	a	Canada, CBC NQ SW Service		9625na	
1700	1800		Canada, CFRX Toronto ON		6070do	
1700	1800		Canada, CFVP Calgary AB		6030do	
1700	1800		Canada, CKZN St John's NF		6160do	
1700	1800		Canada, CKZU Vancouver BC		6160do	
1700	1800		China, China Radio Intl		9570af	9600eu
			11900af	11940eu	13760eu	
1700	1800		Costa Rica, University Network			11870va
			13750va			
1700	1800		Egypt, Radio Cairo	11740af		
1700	1800		Germany, The Voice Africa		15715af	
1700	1800		Italy, IRRS	5785va		
1700	1800		Japan, Radio Japan/NHK World			9535na
1700	1800		Japan, Radio Japan/NHK World			9535va
			11970eu	15355af		
1700	1800		Malaysia, RTM/Trax FM		7295as	
1700	1800		Malaysia, Voice of	6175as		
1700	1800		New Zealand, Radio NZ Intl		7145pa	
1700	1800		Nigeria, Voice of	15120va		
1700	1800	vl	Papua New Guinea, Wantok R.Light			7120va
1700	1800		Russia, Voice of	7300eu	9405as	9890eu
			11510af	11985af		
1700	1800	as	Russia, Voice of	9820eu		
1700	1800		Swaziland, TWR	3200af		
1700	1800		Taiwan, Radio Taiwan Intl		11850af	
1700	1800		UK, BBC World Service		3915as	5975as
			6195eu	7160as	9410eu	9510as
			11955as	15485va	15565eu	
1700	1800	vl/ mtwhf	UK, Sudan Radio Service		11705va	
1700	1800		USA, American Forces Radio		4319usb	5446usb
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
1700	1800		USA, KAIJ Dallas TX		13815na	
1700	1800		USA, KTBN Salt Lake City UT		15590na	
1700	1800		USA, KWHR Naalehu HI		9930as	
1700	1800		USA, Voice of America		7405af	15410af
			15580af			
1700	1800		USA, WBCQ Kennebunk ME		9330na	18910na
1700	1800		USA, WBOH Newport NC		5920am	
1700	1800		USA, WEWN Birmingham AL		13615va	15220va
1700	1800		USA, WHRA Greenbush ME		17640na	
1700	1800		USA, WHRI Noblesville IN		13760am	15285am
			15665am	15785am		
1700	1800		USA, WINB Red Lion PA		13570am	
1700	1800	smtwhf	USA, WMLK Bethel PA		9265eu	
1700	1800		USA, WTJC Newport NC		9370na	
1700	1800		USA, WWCR Nashville TN		9985na	12160na
			13845na	15825na		
1700	1800		USA, WWRB Manchester TN		9385na	11915na
			15250na			
1700	1800		USA, WYFR Okeechobee FL		13690va	17795va va
			18980va	21455va		
1700	1800		Zambia, Christian Voice		4965af	
1730	1745		Israel, Kol Israel	9345va	11590va	13675va
1730	1745	mtwhf	UK, United Nations Radio		7170af	9565me
			17810af			
1730	1759	f	Germany, Bible Voice Broadcasting			13590me
1730	1800		Bulgaria, Radio	9500eu	11500eu	
1730	1800		Guam, AWR/KSDA		9385as	
1730	1800		Liberia, ELWA	4760do		
1730	1800		Philippines, Radio Pilipinas		11720va	15190va
			17720va			
1730	1800		Swaziland, TWR	9500af		
1730	1800		Sweden, Radio	6065va		
1730	1800	mtwhf	USA, Voice of America		13755af	17730af
1730	1800		Vatican City, Vatican Radio		11625af	13765af
			15570af			
1745	1800		India, All India Radio		7410eu	9445af
			9950eu	11620eu	11935af	13605af
			15075af	15155af	17670af	
1745	1800		UK, BBC World Service		3255af	6190af
			11945af	12095af	15105af	15400af
			15485af	17830af	17885af	21470af

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

1800	1810		Zambia, Christian Voice		11735af	
1800	1828		Vietnam, Voice of	5955eu	7280va	9730va
1800	1830		Austria, AWR Europe		15315af	
1800	1830	fas	Germany, Bible Voice Broadcasting			13810af
1800	1830	whf	Germany, Bible Voice Broadcasting			11710me
1800	1830		South Africa, AWR Africa		3215af	3345af
			9610af			
1800	1830		UK, BBC World Service		3255af	5975as
			6190af	9510as	11945af	12095af
			15400af			
1800	1830		USA, Voice of America		7405af	11975af
			15410af	15580af	17895af	
1800	1830	as	USA, Voice of America		4930af	
1800	1845		USA, WYFR Okeechobee FL		17535va	
1800	1850		New Zealand, Radio NZ Intl		7145pa	
1800	1855	f	Italy, IRRS	9380va		
1800	1856		Romania, Radio Romania Intl		9635eu	11830eu
1800	1859		Canada, Radio Canada Intl		9530af	11765af
			13730af	15255af		
1800	1900		Anguilla, Caribbean Beacon		11775am	
1800	1900	mtwhf	Argentina, RAE	9690eu	15345eu	
1800	1900		Australia, Radio	6080pa	7240pa	9475va
			9580pa	9710pa	11880pa	
1800	1900	DRM	Bulgaria, World Radio Network			9310eu
1800	1900		Canada, CFRX Toronto ON		6070do	
1800	1900		Canada, CFVP Calgary AB		6030do	
1800	1900		Canada, CKZN St John's NF		6160do	
1800	1900		Canada, CKZU Vancouver BC		6160do	
1800	1900		China, China Radio Intl		9600eu	11940eu
			13760eu			
1800	1900		Costa Rica, University Network			11870va
			13750va			
1800	1900	as	Germany, Bible Voice Broadcasting			9430me
1800	1900		Germany, The Voice Africa		13820af	
1800	1900		India, All India Radio		7410eu	9445af

			9950eu	11620eu	11935af	13605af
			15075af	15155af	17670af	
1800	1900		Italy, IRRS	5785va		
1800	1900		Liberia, ELWA	4760do		
1800	1900		Malaysia, RTM/Trax FM		7295as	
1800	1900		Malaysia, Voice of	6175as		
1800	1900		Netherlands, Radio		6020af	7120af
			11655af			
1800	1900		Nigeria, Voice of	15120va		
1800	1900		North Korea, Voice of Korea		7570eu	12015eu
1800	1900	vl	Papua New Guinea, Wantok R.Light			7120va
1800	1900		Philippines, Radio Pilipinas		11720va	15190va
			17720va			
1800	1900		Russia, Voice of	7300eu	9745af	9820eu
			9890eu	11510af	11630eu	
1800	1900		Swaziland, TWR	3200af		
1800	1900		Taiwan, Radio Taiwan Intl		3965eu	
1800	1900		UK, BBC World Service		6195eu	9410eu
			12095eu			
1800	1900		USA, American Forces Radio		4319usb	5446usb
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
1800	1900		USA, KAIJ Dallas TX		13815na	
1800	1900		USA, KTBN Salt Lake City UT		15590na	
1800	1900	smtwhf	USA, WBCQ Kennebunk ME		7415na	
1800	1900		USA, WBCQ Kennebunk ME		9330na	18910na
1800	1900		USA, WBOH Newport NC		5920am	
1800	1900		USA, WEWN Birmingham AL		13615va	15220va
1800	1900		USA, WHRA Greenbush ME		17640na	
1800	1900		USA, WHRI Noblesville IN		13760am	15285am
			15665am	15785am		
1800	1900		USA, WINB Red Lion PA		13570am	
1800	1900	smtwhf	USA, WMLK Bethel PA		9265eu	
1800	1900		USA, WTJC Newport NC		9370na	
1800	1900		USA, WWCR Nashville TN		9975na	12160na
			13845na	15825na		
1800	1900		USA, WWRB Manchester TN		9385na	11915na
			15250na			
1800	1900		USA, WYFR Okeechobee FL		13690va	13800va
			15750af	17795va	18980va	
1800	1900		Yemen, Rep of Yemen Radio		9780me	
1800	1900		Zambia, Christian Voice		4965af	
1815	1830	mwf	Germany, Bible Voice Broadcasting			6015eu
1815	1845	h	Germany, Bible Voice Broadcasting			6015eu
1815	1900		Bangladesh, Bangla Betar		7185eu	
1830	1900		Greece, Voice of	7430eu		
1830	1900		Serbia & Montenegro, Intl Radio			6100eu
1830	1900		Slovakia, Radio Slovakia Intl		5920eu	6055eu
1830	1900		Turkey, Voice of	9785eu		
1830	1900		UK, BBC World Service		3255af	6005af
			6190af	9630af	11945af	12045me
			12095af	15400af	17795af	17830af
			21470af			
1830	1900		USA, Voice of America		4930af	7405af
			11975af	15410af	15580af	17895af
1845	1900	mtwhfa	Albania, Radio Tirana		7465eu	9920eu
1845	1900		Congo, RTV Congolaise		4765af	5985af
1851	1900		New Zealand, Radio NZ Intl		9630pa	15720pa

1900 UTC - 3PM EDT / 2PM CDT / 12PM PDT

1900	1915		Congo, RTV Congolaise		4765af	5985af
1900	1915	a	Germany, Bible Voice Broadcasting			9430me
1900	1925		Israel, Kol Israel	9400va	11590va	15640af
1900	1928		Vietnam, Voice of	7280va	9730va	
1900	1929	s	Germany, Universal Life		11880me	
1900	1930	s	Germany, Bible Voice Broadcasting			9775af
1900	1930		Hungary, Radio Budapest		3975eu	6025eu
1900	1930		Philippines, Radio Pilipinas		11720va	15190va
			17720va			
1900	1930		Turkey, Voice of	9785eu		
1900	1945		India, All India Radio		7410eu	9445af
			9950eu	11620eu	11935af	13605af
			15075af	15155af	17670af	
1900	1945		USA, WYFR Okeechobee FL		6085va	
1900	1950		New Zealand, Radio NZ Intl		9630pa	15720pa
1900	2000		Anguilla, Caribbean Beacon		11775am	
1900	2000		Australia, Radio	6080pa	7240pa	9500as
			9580pa	9710pa	11880pa	
1900	2000		Belarus, Radio	7105eu	7290eu	
1900	2000	DRM	Bulgaria, World Radio Network			9310eu
1900	2000		Canada, CFRX Toronto ON		6070do	
1900	2000		Canada, CFVP Calgary AB		6030do	
1900	2000		Canada, CKZN St John's NF		6160do	
1900	2000		Canada, CKZU Vancouver BC		6160do	
1900	2000		China, China Radio Intl		7295af	9440va
			11940eu			
1900	2000		Costa Rica, University Network			11870va
			13750va			
1900	2000		Eqt Guinea, Radio Africa		15190af	
1900	2000		Germany, Deutsche Welle		13780af	15620af
1900	2000		Germany, Overcomer Ministries			9860af
			13810af			
1900	2000		Germany, The Voice Africa		13820af	
1900	2000	vl	Ghana, Ghana BC Corp		3366do	4915do
1900	2000	f	Italy, IRRS	5785va	9380va	
1900	2000		Liberia, ELWA	4760do		
1900	2000		Malaysia, RTM/Trax FM		7295as	
1900	2000	vl	Namibia, Namibian BC Corp		3270do	3290do
			6060do	6175do		
1900	2000		Netherlands, Radio		5905af	7120af
			11655af	17810af		
1900	2000	as	Netherlands, Radio		15315na	17735na
			17660na			
1900	2000		Nigeria, Radio/Ibadan		6050do	
1900	2000		Nigeria, Radio/Kaduna		4770do	6090do
1900	2000		Nigeria, Radio/Lagos		3326do	4990do
1900	2000		Nigeria, Voice of	15120va		
1900	2000		North Korea, Voice of Korea		7100af	9975va
			11535va	11910af		
1900	2000		Papua New Guinea, Catholic Radio			4960do
1900	2000		Papua New Guinea, NBC		4890do	
1900	2000	vl	Papua New Guinea, Wantok R.Light			7120va
1900	2000		Russia, Voice of	7310eu	9890eu	12070eu
1900	2000	irreg/ vl	Sierra Leone, SLBS	3316do		
1900	2000	vl	Solomon Islands, SIBC		5020do	9545do
1900	2000		South Korea, KBS World Radio			5975va
			7275eu			
1900	2000	a	Sri Lanka, SLBC	6010eu		
1900	2000		Swaziland, TWR	3200af		
1900	2000		Thailand, Radio	7155eu		
1900	2000	vl	Uganda, Radio	4976do	5026do	7196do
1900	2000		UK, BBC World Service		3255af	6005af
			6190af	6195eu	9410eu	9630af
			12045me	12095af	15400af	17795af
			17830af			
1900	2000		USA, American Forces Radio		4319usb	5446usb
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
1900	2000		USA, KAIJ Dallas TX		13815na	
1900	2000		USA, KJES Vado NM		15385na	
1900	2000		USA, KTBN Salt Lake City UT		15590na	
1900	2000		USA, Voice of America		4930af	4940af
			6040me	7405af	9670me	11975af
			15410af	15445af	15580af	17895af
1900	2000		USA, WBCQ Kennebunk ME		7415na	9330na
			18910na			
1900	2000		USA, WBOH Newport NC		5920am	
1900	2000		USA, WEWN Birmingham AL		13615va	15220va
1900	2000		USA, WHRA Greenbush ME		13710na	
1900	2000		USA, WHRI Noblesville IN		13760am	15285am
			15665am	15785am		
1900	2000		USA, WINB Red Lion PA		13570am	
1900	2000		USA, WTJC Newport NC		9370na	
1900	2000		USA, WWCR Nashville TN		9975na	12160na
			13845na	15825na		
1900	2000		USA, WWRB Manchester TN		9385na	11915na
			15250na			
1900	2000		USA, WYFR Okeechobee FL		3230va	
			13800va	17795va	17845va	18930va
			18980va			
1900	2000		Zambia, Christian Voice		4965af	
1900	2000	vl	Zimbabwe, ZBC Corp		5975do	
1910	1930		Armenia, Public Radio of		4810eu	9960eu
1930	2000	s	Germany, Bible Voice Broadcasting			9775af
1930	2000	s	Germany, Pan American BC		9430me	
1930	2000		Iran, Voice of the Islamic Rep		6205eu	7205eu
			9800af	9925af	11860al	
1930	2000		Sweden, Radio	6065va		
1935	1955		Italy, RAI Intl		5960eu	9485eu
1945	2000	vl	Rwanda, Radio	6055do		
1950	2000		Vatican City, Vatican Radio		4005eu	5885eu
			7250eu	9645eu		
1951	2000		New Zealand, Radio NZ Intl		15720pa	

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

2000	2015	f	Germany, Pan American BC		9430me	
2000	2027		Czech Rep, Radio Prague		5930va	11600va
2000	2030	mtwhfa	Albania, Radio Tirana		7465eu	
2000	2030	h	Germany, Bible Voice Broadcasting			9605va
2000	2030	as	Germany, Pan American BC		9430me	
2000	2030		Iran, Voice of the Islamic Rep		6205eu	7205eu
			9800af	9925af	11860al	
2000	2030		Mongolia, Voice of	12015eu		
2000	2030		South Africa, AWR Africa		7180af	
2000	2030		Swaziland, TWR	3200af		
2000	2030		USA, Voice of America		4940af	4940af
			7405af	11975af	15410af	15445af
			15580af			
2000	2030		Vatican City, Vatican Radio		9755eu	11625eu
			13765eu			

2000	2030		Vatican City, Vatican Radio 13765af	9755af	11625af	
2000	2045		USA, WYFR Okeechobee FL	13690va	17750va	
2000	2059		Canada, Radio Canada Intl 11765eu	5850eu	7235eu	
2000	2059	mtwhf	Spain, Radio Exterior Espana	9595af	15290eu	
2000	2100		Anguilla, Caribbean Beacon	11775am		
2000	2100		Australia, ABC NT Alice Springs 4835irr		2310do	
2000	2100		Australia, ABC NT Katherine	2485do		
2000	2100		Australia, ABC NT Tennant Creek		2325do	
2000	2100		Australia, Radio 11880pa	9500as 12080pa	11650pa	11660pa
2000	2100		Belarus, Radio	7105eu	7290eu	
2000	2100	DRM	Bulgaria, World Radio Network		9310eu	
2000	2100		Canada, CFRX Toronto ON	6070do		
2000	2100		Canada, CFVP Calgary AB	6030do		
2000	2100		Canada, CKZN St John's NF	6160do		
2000	2100		Canada, CKZU Vancouver BC	6160do		
2000	2100		Canada, Radio Canada Intl	17765am		
2000	2100		China, China Radio Intl 9800eu	7295as 11640af	11790eu	9440va 13630af
2000	2100		Costa Rica, University Network		13750va	
2000	2100		Egypt, Radio Cairo	15375af		
2000	2100		Eqt Guinea, Radio Africa	15190af		
2000	2100		Germany, Deutsche Welle 13780af	7130af 15205af	11795af	
2000	2100		Germany, Overcomer Ministries 13810af		9860af	
2000	2100		Germany, The Voice Africa	13820af		
2000	2100	vl	Ghana, Ghana BC Corp	3366do	4915do	
2000	2100		Indonesia, Voice of 15150al	9525as	11785pa	
2000	2100		Italy, IRRS	5785va		
2000	2100		Liberia, ELWA	4760do		
2000	2100		Malaysia, RTM/Trax FM	7295as		
2000	2100	vl	Namibia, Namibian BC Corp 6060do	3270do 6175do	3290do	
2000	2100	as	Netherlands, Radio 17660af	15315af	17735na	
2000	2100		Netherlands, Radio 11665af	5905af 17810af	7120af	
2000	2100		New Zealand, Radio NZ Intl	15720pa		
2000	2100		Nigeria, Radio/Ibadan	6050do		
2000	2100		Nigeria, Radio/Kaduna	4770do	6090do	
2000	2100		Nigeria, Radio/Lagos	3326do	4990do	
2000	2100		Nigeria, Voice of	15120va		
2000	2100		Papua New Guinea, Catholic Radio		4960do	
2000	2100		Papua New Guinea, NBC	4890do		
2000	2100	vl	Papua New Guinea, Wantok R.Light		7120va	
2000	2100		Russia, Voice of 15735sa	9890eu	12070eu	15455eu
2000	2100	vl	Solomon Islands, SIBC	5020do	9545do	
2000	2100		South Africa, Channel Africa	3345af		
2000	2100	vl	Uganda, Radio	4976do	5026do	7196do
2000	2100		UK, BBC World Service 6190af 12095af	3255af 6195eu 15400af	6005af 9410eu 17830af	9630af
2000	2100		USA, American Forces Radio 5765usb 10320usb 13855usb	4319usb 6350usb 12133usb	5446usb 7590usb 12579usb	7812usb 13362usb
2000	2100		USA, KAIJ Dallas TX	13815na		
2000	2100		USA, KJES Vado NM	15385na		
2000	2100		USA, KTBN Salt Lake City UT	15590na		
2000	2100		USA, WBCQ Kennebunk ME 18910na	7415na	9330na	
2000	2100		USA, WBOH Newport NC	5920am		
2000	2100		USA, WEWN Birmingham AL	13615va	15220va	
2000	2100		USA, WHRA Greenbush ME	13710na		
2000	2100		USA, WHRI Noblesville IN 15665am	13760am 15785am	15285am	
2000	2100		USA, WINB Red Lion PA	13570am		
2000	2100		USA, WTJC Newport NC	9370na		
2000	2100		USA, WWCR Nashville TN 13845na	9975na 15825na	12160na	
2000	2100		USA, WWRB Manchester TN 15250na	9385na	11915na	
2000	2100		USA, WYFR Okeechobee FL 17725va	3230va 17795va	13800va 17845va	18980va
2000	2100		Zambia, Christian Voice	4965af		
2000	2100	vl	Zimbabwe, ZBC Corp	5975do		
2005	2100		Syria, Radio Damascus 13610al	9330eu	12085eu	
2025	2045		Italy, RAI Intl	5970af	11875af	
2030	2045		Thailand, Radio	9680eu		
2030	2058		Vietnam, Voice of 13860va	7280va	9550va	9730va
2030	2100		Cuba, Radio Havana	9505va	11760va	
2030	2100		Turkey, Voice of	7170as		
2030	2100		USA, Voice of America 11975af	4930af 15410af	7555as 15445af	15580af
2030	2100	as	USA, Voice of America	4940af		
2045	2100		India, All India Radio 9910oc	7410eu 9950eu	9445eu 11620va	11715oc
2055	2100	DRM	Vatican City, Vatican Radio	9800na		

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	a	Canada, CBC NQ SW Service	9625na		
2100	2130		China, China Radio Intl	11640af	13630af	
2100	2130		Cuba, Radio Havana	9505va	11760va	
2100	2130		Egypt, Radio Cairo	15375af		
2100	2130		Hungary, Radio Budapest	6025eu	9525eu	
2100	2130		South Korea, KBS World Radio		3955eu	
2100	2130		Turkey, Voice of	7179as		
2100	2130		UK, BBC World Service	11675va	15390va	
2100	2130	DRM	Vatican City, Vatican Radio	9800na		
2100	2145		Nigeria, Radio/Ibadan	6050do		
2100	2145		USA, WYFR Okeechobee FL 17795va	13690va 18980va	13800va	
2100	2159		Canada, Radio Canada Intl	9800na	17765na	
2100	2159	as	Spain, Radio Exterior Espana	9595af	9840eu	
2100	2200		Anguilla, Caribbean Beacon	11775am		
2100	2200		Australia, ABC NT Alice Springs 4835irr		2310do	
2100	2200		Australia, Radio 11660pa	7240pa 11695pa	9660pa 12080pa	11650pa 13630pa
2100	2200		Belarus, Radio	7105eu	7290eu	
2100	2200		Bulgaria, Radio	5800eu	7500eu	
2100	2200		Canada, CFRX Toronto ON	6070do		
2100	2200		Canada, CFVP Calgary AB	6030do		
2100	2200		Canada, CKZN St John's NF	6160do		
2100	2200		Canada, CKZU Vancouver BC	6160do		
2100	2200		China, China Radio Intl 11790eu	9600eu	9800eu	
2100	2200		Costa Rica, University Network		13750va	
2100	2200		Eqt Guinea, Radio Africa	15190af		
2100	2200		Germany, Deutsche Welle 15210af	9440af	11865af	
2100	2200	vl	Ghana, Ghana BC Corp	3366do	4915do	
2100	2200		Guyana, Voice of	3291do	5950do	
2100	2200		India, All India Radio 11715oc	9910oc	11620oc	
2100	2200		Italy, IRRS	5785va		
2100	2200		Japan, Radio Japan/NHK World 6055eu 21670pa	6180eu	11855af	6035oc 17825va
2100	2200		Liberia, ELWA	4760do		
2100	2200		Liberia, Star Radio	11960af		
2100	2200		Malaysia, RTM/Trax FM	7295as		
2100	2200	vl	Namibia, Namibian BC Corp 6060do	3270do 6175do	3290do	
2100	2200		New Zealand, Radio NZ Intl	15720pa		
2100	2200		Nigeria, Radio/Kaduna	4770do	6090do	
2100	2200		Nigeria, Radio/Lagos	3326do	4990do	
2100	2200		North Korea, Voice of Korea	7570eu	12015eu	
2100	2200		Papua New Guinea, Catholic Radio		4960do	
2100	2200		Papua New Guinea, NBC	4890do		
2100	2200	vl	Papua New Guinea, Wantok R.Light		7120va	
2100	2200		Russia, Voice of	15735sa		
2100	2200	vl	Rwanda, Radio	6055do		
2100	2200	irreg/ vl	Sierra Leone, SLBS	3316do		
2100	2200		South Africa, Channel Africa	3345af		
2100	2200		Syria, Radio Damascus 13610al	9330eu	12085eu	
2100	2200		UK, BBC World Service 5965as 11945as	3255af 6005af 12095af	3915as 6190af 15400af	6195as
2100	2200		Ukraine, Radio Ukraine Intl	5830eu		
2100	2200		USA, American Forces Radio 5765usb 10320usb 13855usb	4319usb 6350usb 12133usb	5446usb 7590usb 12579usb	7812usb 13362usb
2100	2200		USA, KAIJ Dallas TX	13815na		
2100	2200		USA, KTBN Salt Lake City UT	15590na		
2100	2200		USA, Voice of America	7555as		
2100	2200		USA, WBCQ Kennebunk ME 18910na	7415na	9330na	
2100	2200		USA, WBOH Newport NC	5920am		
2100	2200		USA, WEWN Birmingham AL	13615va	15220va	
2100	2200		USA, WHRA Greenbush ME	11610na	11765na	
2100	2200		USA, WHRI Noblesville IN 15665am	13760am 15785am	15285am	
2100	2200		USA, WINB Red Lion PA	13570am		
2100	2200		USA, WRMI Miami FL	7385am		
2100	2200		USA, WTJC Newport NC	9370na		
2100	2200		USA, WWCR Nashville TN 13845na	9975na 15825na	12160na	
2100	2200		USA, WWRB Manchester TN 15250na	9385na	11915na	

2100	2200		USA, WYFR Okeechobee FL	6045va	11565va	
			17725va	17845va		
2100	2200		Zambia, Christian Voice	4965af		
2100	2200	vl	Zimbabwe, ZBC Corp	5975do		
2115	2200		Egypt, Radio Cairo	9990eu		
2130	2156		Romania, Radio Romania Intl	7210va	9535va	
			11940va	15465va		
2130	2157		Czech Rep, Radio Prague	9410na	11600af	
2130	2200	mtwhfa	Albania, Radio Tirana	7465eu		
2130	2200		Australia, ABC NT Katherine	5025do		
2130	2200		Australia, ABC NT Tennant Creek		4910do	
2130	2200	mtwhfa	Canada, CBC NQ SW Service	9625na		
2130	2200		Guam, AWR/KSDA	11850as		
2130	2200	DRM	Netherlands, Radio	9800na		
2130	2200		Sweden, Radio	6065va	7420va	
2130	2200		UK, BBC World Service	15390va		

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

2200	2210		Syria, Radio Damascus	9330eu	12085eu	
2200	2230		India, All India Radio	9910oc	11620oc	
			11715oc	9950eu	11620va	11715oc
2200	2230		Papua New Guinea, NBC	9675do		
2200	2245		Egypt, Radio Cairo	9990eu		
2200	2245		USA, WYFR Okeechobee FL	15770va		
2200	2259		Canada, Radio Canada Intl	6100na		
2200	2300		Anguilla, Caribbean Beacon	6090am		
2200	2300		Australia, ABC NT Alice Springs		2310do	
			4835irr			
2200	2300		Australia, ABC NT Katherine	5025do		
2200	2300		Australia, ABC NT Tennant Creek		4910do	
2200	2300		Australia, Radio	12010va	13620as	13630pa
			15515pa	15230as	15240pa	17785pa
			17795pa			
2200	2300	smtwhf	Canada, CBC NQ SW Service	9625na		
2200	2300		Canada, CFRX Toronto ON	6070do		
2200	2300		Canada, CFVP Calgary AB	6030do		
2200	2300		Canada, CKZN St John's NF	6160do		
2200	2300		Canada, CKZU Vancouver BC	6160do		
2200	2300	DRM	Canada, Radio Canada Intl	9800na		
2200	2300		China, China Radio Intl	7170eu		
2200	2300		Costa Rica, University Network		13750va	
2200	2300		Eqt Guinea, Radio Africa	15190af		
2200	2300		Germany, Deutsche Welle	7115as		
2200	2300	vl	Ghana, Ghana BC Corp	3366do	4915do	
2200	2300		Guyana, Voice of	3291do		
2200	2300		Italy, IRRS	5785va		
2200	2300		Malaysia, RTM/Trax FM	7295as		
2200	2300	vl	Namibia, Namibian BC Corp	3270do	3290do	
			6060do	6175do		
2200	2300		New Zealand, Radio NZ Intl	15720pa		
2200	2300		Nigeria, Radio/Ibadan	6050do		
2200	2300		Nigeria, Radio/Kaduna	4770do	6090do	
2200	2300		Nigeria, Radio/Lagos	3326do	4990do	
2200	2300		Papua New Guinea, Catholic Radio		4960do	
2200	2300	vl	Papua New Guinea, Wantok R.Light		7120va	
2200	2300	irreg/ vl	Sierra Leone, SLBS	3316do		
2200	2300	vl	Solomon Islands, SIBC	5020do	9545do	
2200	2300		Taiwan, Radio Taiwan Intl	9355eu		
2200	2300		Turkey, Voice of	9830eu		
2200	2300		UK, BBC World Service	5955af	5965as	
			5975va	6195as	7105as	9740as
			12095af	15400af		
2200	2300		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
2200	2300		USA, KAIJ Dallas TX	13815na		
2200	2300		USA, KTBN Salt Lake City UT	15590na		
2200	2300		USA, Voice of America	7215va	7555as	
			15185va	15290va	17740va	
2200	2300	mtwhf	USA, WBCQ Kennebunk ME	5110na	18910na	
2200	2300		USA, WBCQ Kennebunk ME	7415na	9330na	
2200	2300		USA, WBOH Newport NC	5920am		
2200	2300		USA, WEWN Birmingham AL	9975va	15745va	
2200	2300		USA, WHRA Greenbush ME	11610na	11765na	
2200	2300	m	USA, WHRI Noblesville IN	7490am		
2200	2300		USA, WHRI Noblesville IN	9840am	13760am	
			15285am			
2200	2300		USA, WINB Red Lion PA	9265am		
2200	2300	mtwhf	USA, WRMI Miami FL	7385am		
2200	2300	as	USA, WRMI Miami FL	9955am		
2200	2300		USA, WTJC Newport NC	9370na		
2200	2300		USA, WWCR Nashville TN	5070na	7465na	
			9985na	13845na		
2200	2300		USA, WWRB Manchester TN	9385na	11915na	
			15250na			
2200	2300		USA, WYFR Okeechobee FL	11740va		
2200	2300		Zambia, Christian Voice	4965af		
2205	2230		Italy, RAI Intl	11895as		
2230	2257		Czech Rep, Radio Prague	7345na	9415af	
2230	2300		Guam, AWR/KSDA	15320as		
2230	2300		USA, Voice of America	9570va	13755va	
			15145va			
2245	2300		India, All India Radio	9705as	9950as	
			11620as	11645as	13605as	

2300 UTC - 7PM EDT / 6PM CDT / 4PM PDT

2300	0000		Anguilla, Caribbean Beacon	6090am		
2300	0000		Australia, ABC NT Alice Springs		2310do	
			4835irr			
2300	0000		Australia, ABC NT Katherine	5025do		
2300	0000		Australia, ABC NT Tennant Creek		4910do	
2300	0000		Bulgaria, Radio	9700na		
2300	0000	smtwhf	Canada, CBC NQ SW Service	9625na		
2300	0000		Canada, CFRX Toronto ON	6070do		
2300	0000		Canada, CFVP Calgary AB	6030do		
2300	0000		Canada, CKZN St John's NF	6160do		
2300	0000		Canada, CKZU Vancouver BC	6160do		
2300	0000		China, China Radio Intl	5990am	6145na	
			13680na			
2300	0000		Costa Rica, University Network		9725va	
2300	0000		Cuba, Radio Havana	9550na		
2300	0000		Egypt, Radio Cairo	11950na		
2300	0000		Germany, Deutsche Welle	5955as	9890as	
			15135as	17860as		
2300	0000	vl	Ghana, Ghana BC Corp	3366do	4915do	
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	vl	Namibia, Namibian BC Corp	3270do	3290do	
			6060do	6175do		
2300	0000		New Zealand, Radio NZ Intl	15720pa		
2300	0000		Papua New Guinea, Catholic Radio		4960do	
2300	0000		Papua New Guinea, NBC	9675do		
2300	0000	vl	Papua New Guinea, Wantok R.Light		7120va	
2300	0000		Romania, Radio Romania Intl	6140va	7265va	
			9645va	11940va		
2300	0000	irreg/ vl	Sierra Leone, SLBS	3316do		
2300	0000		Singapore, MediaCorp Radio	6150do		
2300	0000	vl	Solomon Islands, SIBC	5020do	9545do	
2300	0000		UK, BBC World Service	3915as	5965as	
			6195as	9580as	9740as	11850as
			11945as	11955as		
2300	0000		USA, American Forces Radio	4319usb	5446usb	
			5765usb	6350usb	7590usb	7812usb
			10320usb	12133usb	12579usb	13362usb
			13855usb			
2300	0000		USA, KAIJ Dallas TX	13815na		
2300	0000		USA, KTBN Salt Lake City UT	15590na		
2300	0000		USA, Voice of America	7215va	7555as	
			15185va	17740va		
2300	0000		USA, WBCQ Kennebunk ME	5110na	7415na	
			9330na	18910na		
2300	0000		USA, WBOH Newport NC	5920am		
2300	0000		USA, WEWN Birmingham AL	9975va	15745va	
2300	0000		USA, WHRA Greenbush ME	7520na		
2300	0000	m	USA, WHRI Noblesville IN	7490am		
2300	0000		USA, WHRI Noblesville IN	7555am	9840am	
			13760am			
2300	0000		USA, WINB Red Lion PA	9265am		
2300	0000	mtwhf	USA, WRMI Miami FL	7385am		
2300	0000		USA, WTJC Newport NC	9370na		
2300	0000		USA, WWCR Nashville TN	5070na	7465na	
			9985na	13845na		
2300	0000		USA, WWRB Manchester TN	6890na		
2300	0000		USA, WYFR Okeechobee FL	15255am	17750am	
2300	2315		Nigeria, Radio/Kaduna	4770do	6090do	
2300	2315		Nigeria, Radio/Lagos	3326do		
2300	2330		Australia, Radio	9660pa	12010pa	12080pa
			13670va	15230va	15240va	17785va
			17795va			
2300	2330	DRM	Germany, Deutsche Welle	9800na		
2300	2330		USA, Voice of America	9570va	13755va	
			15145va			
2300	2345		USA, WYFR Okeechobee FL	11740va		
2300	2345		Vatican City, Vatican Radio	9750na		
2315	2330		Croatia, Croatian Radio	9925sa		
2330	0000		Australia, HCJB	15390as		
2330	0000		Australia, Radio	9660pa	12010pa	12080pa
			13670va	15230va	15415va	17750as
			17785pa	17795va		
2330	0000		Burma, Dem Voice of Burma	5955eu		
2330	0000		Lithuania, Radio Vilnius	9875na		
2330	0000	DRM	Sweden, Radio	9800na		
2330	0000		USA, Voice of America	7260va	9570va	
			13725va	13755va	15145va	
2330	0000	s	USA, WRMI Miami FL	9955am		
2330	2358		Vietnam, Voice of	9840as	12020as	

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Monitoring the Fort Worth Military

One of the fond memories from my military career while stationed in the Dallas-Fort Worth area was visiting the old Carswell Air Force Base (west side of Fort Worth) for the first time. I had just been cleared through the main gate and a sight unfolded before me I will never forget. Not more than 1/8 of a mile away, a US Air Force B-52 bomber was slowly lifting off from the Carswell main runway. That was truly a remarkable sight to see, something that enormous taking flight.

The days of the SAC B-52s at the Carswell Air Force Base are long over. However, the base I came to love so long along is still active and going strong. It is now known as the Naval Air Station/Joint Reserve Base (NAS/JRB) Fort Worth, Texas.

❖ The Beginning

NAS/JRB Fort Worth is located at the site of the former Carswell Air Force Base. In 1941, the installation was known as the Tarrant Field Airdrome, which served the Consolidated Vultee Aircraft Corporation. The airdrome became Fort Worth Army Air Field on January 2, 1942, following the attack in Pearl Harbor. A variety of aircraft were produced at what became "Air Force Plant 4," including the B-24, B-36, B-58, F-111 and F-16.

The airfield was renamed Carswell AFB in 1948 to honor Fort Worth native Major Horace Seaver Carswell Jr., who was awarded the Medal of Honor for heroism.

Carswell AFB was one of the first Strategic Air Command bases, hosting B-29, B-36, B-58, and B-52 bombers from the 7th Bomb Wing, which maintained a long standing vigil during the Cold War.

❖ Air Force Realignment

As part of the Department of Defense's 1991 consolidation efforts, the decision was made to relocate the 7th Bomb Wing from Carswell AFB. During a 1992 Air Force-wide reorganization, the famed Strategic Air Command was officially disestablished. On October 1, 1993, the Air Force Reserve 301st Fighter Wing assumed base responsibilities, establishing Carswell as an Air Reserve Base.

NAS/JRB Fort Worth was officially established on October 1, 1994, as the first joint service reserve base. The 1,805-acre base is the result of the DoD's 1993 BRAC recommendation to relocate NAS Dallas and its tenant commands to the former Carswell ARB. Additional tenant commands from other closing installations were also directed to relocate to NAS/JRB Fort Worth, such as U.S. Marine Corps Reserve squadrons from Memphis, Tennessee, and Glenview, Illinois, in July/August 1994. The 1993 BRAC proceedings also placed the Navy as the host of the new joint military reserve base.

❖ Who is Based Here Now?

So who is assigned to the base today? Quite a few commands are here, including several flying commands. Following is a list of major tenant commands located at NAS/JRB Fort Worth.

- Commander, Naval Reserve Intelligence Command
- Reserve Intelligence Area Six
- Naval Reserve Readiness Command South
- Naval Meteorology and Oceanography
- Commander, Naval Reserve Center
- Commander Fleet Logistics Support Wing
- Fleet Logistics Support Squadron 59*
- Fighter Attack Squadron 201*
- 9th Naval Construction Regiment
- Naval Mobile Construction Battalion 22
- Marine Air Group 41
- Marine Air Control Squadron 24
- Marine Fighter Attack Squadron 112*
- Marine Aerial Refueler Transport Squadron 234*
- Marine Aviation Logistics Squadron 41
- 14th Marine Regiment
- 10th Air Force
- 301st Fighter Wing
- 457th Fighter Squadron*
- 136th Airlift Wing, Texas Air National Guard*
- Army Reserve 370th Chemical Unit

** indicates a flying unit*

There are quite a few communications opportunities for those who are close enough to the base to monitor VHF/UHF communications. Check out Table One for a list of frequencies and trunk system talkgroups.

No matter which branch of service you like to monitor, NAS/JRB Fort Worth offers the radio hobbyist a full menu of services, options and listening opportunities.

❖ DoD Frequency Changes

We continue to see major changes in the aero frequencies moving out of the new DoD 380-400 MHz LMR subband. Jack NeSmith checks in with the latest DoD frequency changes.

CONUS Bases

Dobbins ARB (KMGE)
  Pilot-to-Dispatch (PTD) 139.300
Dover AFB (KDOV)
  Departure Control 373.000 (ex-323.000)
Eglin AFB (KVPS)
  Command Post 318.050 (Primary)
    328.025 (Secondary)
Ellsworth AFB (KRCA)
  RAPCON Arrival 284.000 (ex-393.000)
Fort Irwin-Barstow/Bicycle Lake AAF (KBYS)
  CCT Team McChord (ROZ 1)
    281.450 (Primary)
    41.50 FM (Secondary)
    118.175 (Secondary) "Ironcross"
  Desert Radio 339.850 (South Area)
    302.300 (North Area)
    41.000 (FM)
    126.200 or RCS Channel 445
Homestead ARB (KHST)
  Approach Control 257.675
  Tower 279.550
Hurlburt Field (KHRT)
  Air/Ground Facility 123.975 (ex-139.600)
Lakehurst/Maxwell Field (KNEL)
  Ground Control 307.050 (ex-352.400)
McEntire ANGS (KMMT)
  Ground Control 233.700 (ex-395.800)
  GCA Frequency 269.050 (ex-395.100)/
    306.200 (ex-287.700)
Point Mugu NAS (Naval Base Ventura County) (KNTD)
  Primary UHF Frequency 307.275 (Also 233.700)
Randolph AFB (KRND)
  Ground Control 119.750 (ex-134.050)
San Clemente Island NALF (KNUC)
  Ground Control 251.050
Shell AHP (KSXS) and Knox AHP (KFHK)
  Hancy Ground Control 149.600
  225.575

Hancey Tower 141.800 387.700
Hatch Tower South Frequency 328.150
Runkle 32.050 139.425 142.900 270.700 273.300
Troy GCA 123.775 317.625 346.275
Cairns Corridors' Air to Air Frequencies:
Bearcat Corridor (Skelly, Lucas) 252.025
Highbluff Corridor (Highbluf) 372.100
Southeast Corridor (Allen) 348.375
Toth Corridor (Toth) 328.125
Tinker AFB (KTIK)
Single Frequency Approach 354.125
Wheeler-Sack AAF (KGTB)
Range (R-5201) Northeast (Drum Control) 134.100 318.800
Whiteman AFB (KSZL)
Departure frequency 398.2 no longer in use, now 343.650 is used instead.
Wright AAF (Fort Stewart) (KLHW)
Tower VHF 126.250
Tower FM 38.500

Pacific Bases

Allen AAF (PABI)
ATIS 132.075
CTAF 122.900
Ground Control 118.225 251.050
Tower 125.325 254.275
Elmendorf AFB (PAED)
Clearance Delivery 128.800 306.925
Fairbanks AFB (PAFA)
Eielson Range Control 125.300/229.400
Kaneohe Bay MCAF (PHNG/NGF)
Primary Approach Control 263.500
Tower UHF Secondary 342.600

Atlanta Hartsfield-Jackson Fifth Runway

The world's busiest airport now has a fifth runway in operation (10-28). This new 9,000-foot long air carrier runway is located 4,200 feet south of the airport's former southernmost runway 9R-27L. There is occasional usage by military aircraft of this airport, so for monitors in the "Hotlanta" area, here are the latest VHF/UHF frequencies for Atlanta KATL.

ATIS 119.650 (Arrival)
125.550 (Departure)
Tower 119.100/381.600 (Rwy 8L-26R)
125.325/381.600 (Rwy 8R-26L)
119.300/381.600 (Rwy 9R-27L)
123.850/381.600 (Rwy 9L-27R)
119.500/381.600 (Rwy 10-28)
Ground Control
121.900/381.600 (Rwys 8L-26R/8R-26L)
121.750/381.600 (Rwys 9L-27R/9R-27L)
121.650/381.600 (10-28)
Clearance Delivery 118.100
Ramp Frequencies 131.450 (1)
131.850 (2)
129.275 (3)
130.075 (4)
129.375 (5)
131.375 (6)

❖ EAM LF Broadcast

Recently on the now defunct *WUN* newsgroup, VLF specialist, Trond Jacobsen, caught a U.S. Navy TACAMO aircraft broadcasting in the clear on 17.8 kHz using 85 Hz shift/50 baud. This is the text copied on channel one.

QUEBEC LIMA YANKEE SEVEN JULIETT GOLF CHARLIE BRAVO INDIA GOLF YANKEE WHISKEY ECHO ROMEO HOTEL ECHO BT
NNN NNN NNN KKK KKK
ZCZCZCZ XLLXLLXLL ZZ
BT
SIERRE ALFA OSCAR NOVEMBER FIVE VICTOR FIVE GOLF UNIFORM
NOVEMBER CHARLIE TWO QUEBEC LIMA YACKEE SSEVEN
RJUWETT GOLF CHJLIE BRAVOO INDIA GOLF YANKEE WHISKEYX HO OMEO TOLEL CHOV BTNNN NNN
NMFND CHANNEL ONE NHCCEL OFE CHANNEL ONE CHANENE
SCHANNENE

Jeff Haverlah, in Houston, immediately recognized and identified the broadcast content as a 28-character EAM (Emergency Action Message) he had caught earlier that day. Here is that plain text 28-character EAM Jeff monitored: SAON5V 5GUNC2QLY7JGCBI6YWERHE

So VLF monitors might want to keep a sharp eye out for EAM broadcasts by the TACAMO aircraft in the radio basement at 17.8 kHz.

And, speaking of the TACAMO aircraft, from page 63 of the recently released *Quadrennial Defense Review Report*:

"QDR Decisions. To achieve the characteristics of the future joint force and build on progress to date, the Department will:

· Retire four E-4B National Airborne Operations Center (NAOC) aircraft and accelerate procurement of two C-32 aircraft with state-of-the-art mission suites as replacement aircraft.

· Upgrade E-6B TACAMO command and control aircraft to sustain a survivable airborne link to strategic nuclear forces and provide an airborne cellular base station for domestic catastrophic events."

So it looks like another Cold War airborne asset, the E-4 NAOC, is on its way out.

And that does it for this month. Until next time, 73 and good hunting.

Table 1 – NAS/JRB Fort Worth

Base Communications Profile

DSN Prefix: 874 ICAO Code: KNFW

Area/Base Aero Frequencies
ATIS 273.575
Base Operations 139.300 291.775
Brownwood MOA (FTW Center)
380.050 317.700 (Hornet)
343.600 (Tomcat) 282.200 (Loon)
DFW Regional Approach/Departure
125.800 257.950
Falcon Range (FTW Center) 290.100
Ground Controlled Approach
128.775 132.225 371.875
Navy Fort Worth Arrival 128.775 371.875
Navy Fort Worth Tower 120.950 269.325 284.725
Navy Fort Worth Ground 126.400 254.325 279.575
PMSV Metro 342.550
Sheppard AFB Monitor 335.900

Lockheed Fort Worth
Operations
123.575 (Secondary)
284.100 (Primary)
292.500 (Secondary)
349.725 (Tertiary)
Flight Test Support
277.750 300.400 349.700

Base Unit List
USAF 136AW/181AS (Callsign Rodeo)
No frequencies currently identified
USAF 301FW/457FS (Callsign Spad)
252.100 (Ops) 276.500 (A-A) 306.000 (A-A)
VHF Freqs:
140.175 140.275 141.650 149.050 149.075 149.125
USMC VMFA-112 (Callsign Cowboy)
252.525 (A-A) 318.600 (Ops) 318.650 (A-A)
VHF Freqs:
140.325 141.950
USMC VMGR-234 (Callsign Ranger)
233.900 289.800 Operations (Range Ops)
USN VFA-201 (Callsign Pistol)
291.675 (A-A)
299.500 (A-A)
320.500 (A-A)
344.200 (Ops)
344.250 (A-A)
355.100 (A-A)
Unknown Unit
355.400 (Ops)

Land Mobile Frequencies
Lockheed Fort Worth
72.040 72.180 72.240 72.360 72.440 152.345/157.605 153.080/158.310 153.140/160.065 153.230 153.350/160.185 451.225/456.225 451.3625 456.3625 461.1875 461.825 462.0125 462.0625 462.1125 462.1625 462.3625 462.4000/467.4000 462.9125 461.8125 462.3250 462.8875 463.2375/468.2375 463.3125/468.3125 463.7375 463.8125 463.8500 463.8625 464.0125 464.3375 464.7125 464.9625 466.1875 466.8125 466.8250 467.0125 467.0625 467.1125 467.1625 467.7500 467.9125 468.8125 468.3500 469.0125 469.3375 469.9625 855.3375/810.3375

49.2375 Unknown user/usage
138.575 Fire/EMS repeater (103.5 PL)
140.025 Miscellaneous Net
140.050 Miscellaneous Net
140.100 Fire/Crash Net
140.325 Marine Ground Maintenance Frequency (tentative)
141.950 Marine Ground Maintenance Frequency (tentative)
149.200 Flight Line/Transit Ops (linked to TG 24576) [This is NOT 149.205 that has been reported on some list-LVH]
163.4635 Lockheed Security Repeater (114.8 Hz)
163.4875 Miscellaneous Net

Base Trunk System
Motorola ASTRO 3600 baud
(APCO 25 Mixed Mode) System ID: 7504
Base Frequency: 406.500 MHz,
Spacing: 12.5-kHz, Offset: 380
Frequencies: 407.3635 407.9625 408.5625 408.9625 409.4375 409.9625 410.3625 410.7625

Talkgroups
48 Base Security (Analog) <Channel 1>
80 Base Security <Channel 2>
112 Base Security <Channel 3>
144 Base Security
192 Unknown user/usage
272 Unknown user/usage
8240 Unknown user/usage(Digital)
8272 Unknown user/usage(Digital)
8304 Unknown user/usage(Digital)
8752 Unknown user/usage(Digital)
9360 Unknown user/usage(Digital)
9456 Unknown user/usage(Digital)
9648 Unknown user/usage(Digital)
9760 Unknown user/POL (P25) [tentative]
24576 Flight Line/Transit Ops (P25)
24608 VFA-201 Maintenance (P25)
24624 Base Public Works (P25)
24640 136AW/181AS Texas ANG
32784 301FW Aircraft Maintenance [Viper/Red]
32816 Unknown user/usage (Digital)
32880 Aircraft Maintenance [Red]
32912 Aircraft Maintenance/Inspection [Maverick] (P25)
32944 Unknown user/usage
33008 301FW Security
40992 Fire Dispatch (P25) <Channel 1>
41008 Fire Talk <Channel 2>
41072 Fire Prevention (P25)
41088 Fire Talk (P25)

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Search and You Shall Find!

Many scanner listeners are perfectly satisfied to scan only a known set of frequencies. They usually have their local police, fire and rescue agencies plus whatever else might interest them. But federal listening is a little different. While federal listeners also rely on scanning known federal frequencies, many of us still worry about missing something.

While scanning confirmed federal frequencies might satisfy some listeners, it's important to realize that most of the previously existing frequency allocations in the federal VHF and UHF bands are in the process of change. You could miss a lot of interesting activity if you are not willing to look around and see what might be out there! Get out your scanner's manual and see how to do a simple search from 162 MHz to 174 MHz, or 406 MHz to 420 MHz and see what you can find.

Lots of listeners depend on frequency listings found on the Internet, but so many of those are old, outdated or of questionable origins. Although most federal frequencies have been considered classified since 1984, many non-law enforcement agencies, such as the Forest Service or the National Parks Service, occasionally listed some operational frequencies on their public web sites. Recently, even these agencies have begun to clear out all the frequency information from the sites accessible to outside users. Remember that federal agency frequency information cannot be accessed in the way that FCC issued licenses can. Accurate lists of federal frequencies depend on us, the listeners!

❖ Why Bother?

I often see questions about monitoring federal agencies on mail lists and web sites, but the most posted answer to these questions seems to be "Don't bother, they're digital and heavily encrypted" (as if lightly encrypted would make any difference). I find this answer very disappointing, because even with the increased use of digital radios, there is still a lot to hear on federal frequencies. So don't give up before you even try.

The transition to narrow band and digital by federal agencies is ongoing. Many agencies are still using analog radio systems and probably will be for a while longer. Some listeners mistakenly believe that all federal communications will be digital, but that is not necessarily true. The mandated changes to the federal bands simply require that they utilize narrow-band transmission modes, not digital, so some agencies may always be analog. Also, encryption is not a perfect solution. Agencies that use encryption still end up transmitting in the

un-encrypted or "clear" mode sometimes, making those communications a very interesting catch.

I am very interested in the collection of federal frequencies. Even if I can't listen to encrypted transmissions, I like knowing who is using what frequency. And often merely knowing that there is activity on a particular agency's frequency can indicate that something is up.

So try a little searching sometime and let us know what you find in your neck of the woods!

❖ FEMA Frequencies

It appears that most normal FEMA operational frequencies may be moving to the UHF band. FEMA recently made a large purchase of UHF P-25 digital radios. An anonymous source passed along some channel information on the FEMA radios and their UHF frequencies. All the listed frequencies can be used in ether P-25 digital or analog modes, and if in the analog mode, they would use a CTCSS tone of 141.3 Hz.

406.2625 – F1, simplex
406.2625 – F2, repeater
407.0625 – F3, simplex
407.0625 – F4, repeater
407.6625 – F5, simplex
407.6625 – F6, repeater
409.0375 – F7, simplex
409.0375 – F8, repeater
410.4625 – F9, simplex
410.4625 – F10, repeater
407.4625 – F11, simplex
407.4625 – F12, repeater
409.0000 – F13, simplex, common channel with the Department of Health & Human Service (DHHS)
409.0000 – F14, repeater, common with DHHS
412.9125 – F15, "Convoy," simplex, used by FEMA vehicle convoys
418.4625 – F16, "Guard"

Other FEMA frequencies in the VHF band may be used by the MERS (mobile emergency response support) vehicles and for interoperability with other agencies. Keep an ear open for activity on these frequencies:

138.0250 138.4625 138.6625 138.8875
140.5125 140.7125 141.4500 143.4625
143.8875 148.3000 149.0250 150.4500
150.5125 150.6625

In late April 2006, there was a movement among some members of Congress to dissolve FEMA and form a new agency to take its place. While the question of FEMA's effectiveness is debated, we'll have to wait and see what becomes of the agency in the future.

❖ Integrated Radio Networks Coming Soon!

Both the Justice Department and the Treasury Department have been exploring the idea of consolidating their various radio systems in to an "integrated" wireless network. There has been a test project of the Justice Integrated Wireless Network or JIWN in the Pacific Northwest for a few years now. The project continues to be tested and used by various federal agencies in the state of Washington, though some sources indicate the system is still suffering from some delays in being fully implemented. A prime contractor for the project has yet to be announced.

I have recently been able to search out more frequency information on the JIWN project. The frequencies used in the test system may look very familiar to veteran federal monitors and this may indicate what frequencies future networks will use. Here are the various sites, all located in Washington State, and their associated frequencies. If I have been able to locate the trunked site, I have noted it also:

Site 101
162.1625 Voice / Data
163.8500 Voice / Data
167.0000 Alternate CC
167.2375 Primary CC
167.6375 Alternate CC
168.8375 Voice / Data
172.8000 Voice / Data

Site 102 – Blaine, WA
163.7250 Voice / Data
167.3125 Primary CC
167.4625 Voice / Data
167.7625 Voice / Data
168.8250 Alternate CC

Site 103 – Bellingham, WA
167.0000 Primary CC
167.4375 Voice
167.6375 Voice

Site 105
165.8250 Voice / Data
170.7375 Primary CC
170.8875 Alternate CC
171.6125 Voice / Data

Site 106 – Seattle, WA

163.2000	Voice / Data
163.6375	Voice / Data
163.8500	Voice / Data
167.2875	Primary CC
167.3875	Alternate CC
167.4625	Voice / Data
167.7125	Voice / Data

Site 107 – Tacoma, WA

162.8875	Voice / Data
167.0000	Voice / Data
167.3375	Voice / Data
167.6875	Primary CC
170.9375	Alternate CC
172.0625	Alternate CC

Site 108 – Olympia, WA

162.3125	Voice / Data
162.7625	Voice / Data
163.0125	Voice / Data
167.2625	Alternate CC
167.6125	Primary CC
168.8500	Voice / Data
169.4125	Voice / Data

Site 109

163.9250	Voice / Data
168.9125	Primary CC
170.0375	Voice / Data
170.6375	Alternate CC

Site 111

163.9375	Voice / Data
167.5875	Alternate CC
168.8750	Primary CC
170.6625	Voice / Data

Site 112

162.9750	Voice / Data
167.2625	Primary CC
167.7375	Alternate CC

Site 114

168.8875	Voice / Secondary CC
170.6750	Primary CC

Site 115 – Vancouver, WA

163.7500	Voice / Data
167.4625	Primary CC
168.8250	Voice
169.4125	Voice

Recent indications show that the Justice and Treasury Departments may be joining forces in this project and perhaps join together in a common radio network. *The Fed Files* will keep you updated on any future developments in the IWN arena!

❖ Extended VHF Air Band

While this topic may seem more suited to the *Boats, Planes, and Trains* column in *Monitoring Times*, there is definitely a *Fed Files* angle to the "extended" or expanded VHF aircraft band. Recently the frequencies from 136.0 to 138.0 MHz were opened up to use by civil aircraft in the United States. Newer aircraft radios now include this range of frequencies.

I mentioned in the May *Fed Files* that the US Forest Service is now requiring all of its fire fighting aircraft to have aviation radios capable of covering these frequencies, and many federal agencies have started to stake out discreet VHF AM frequencies for their aircraft operations in this band as well. Here are a few on which I have received reports, so keep an ear out on these:

Freq MHz, AM	Use
136.2750	Reported DEA air operations
136.3750	Reported Customs air operations
136.7250	Reported Air Force One and "Press Plane" coordination
137.9000	Reported Customs air operations

❖ Federal Frequency Updates

409.9625 MHz was discovered recently as a new, active but unidentified frequency, due to the constant use of encryption. An alert listener caught some units using this frequency with the encryption turned off, so now we have pretty strong evidence that US Postal Inspection Service is using this frequency. The various field units were using the "IDA" call sign, which has been noted in the past as the Postal Inspectors, **www.usps.com/postalinspectors/**.

In South Florida, listeners are reporting a new UHF federal trunked system in the West Palm Beach area. As of May 2006, no one has pinpointed the exact location of this system, but from traffic heard it appears to the VA Medical Center, **www1.va.gov/Visn8/westpalm/**. All voice traffic is using P-25 unencrypted digital voice mode. Here is the system information so far:

System ID = be2e
407.8375, 408.0000, 408.2375, 409.4375, 409.5625

❖ Travel Searches

And just to prove that I practice what I preach, here are some of the frequencies I found while searching the federal bands on some recent business trips. While in Houston, the following frequencies were logged:

150.4375		EMWIN 1200 Baud data
162.1625	P-25	Unknown
163.3250		EMWIN 9600 Baud data
163.5375	P-25	Ellington Field, tied with EFD ground frequency
164.4000	P-25	USSS Houston
164.6000	100.0	CBP Customs
165.2375	100.0	CBP NET 1
165.6875	100.0	CBP Customs
167.5125	167.9	FBI
167.6125	167.9	FBI
167.6625	167.9	FBI
167.7875	167.9	FBI
168.7125		EMWIN 9600 Baud data
170.6750	P-25	Encrypted
170.7250	P-25	FBI "L1"
170.7500	P-25	Federal Courthouse Security
171.1500		NASA Public Affairs Office - Mission Audio
171.4375	P-25	FBI "L2"
173.1000	167.9	FBI
406.2375	P-25	Johnson Space Center
407.0375	P-25	Johnson Space Center
407.2375	P-25	Johnson Space Center
407.4375	P-25	Johnson Space Center
407.6375	P-25	Johnson Space Center
408.1000	P-25	Federal Detention Center
408.2375	123.0	Unknown
408.5500	P-25	Johnson Space Center
409.5125	P-25	Johnson Space Center
409.6500	P-25	Federal Detention Center
409.7125	P-25	Johnson Space Center
409.9125	P-25	Johnson Space Center
410.0250	P-25	Federal Detention Center
410.4875	P-25	Unknown
410.5125	P-25	Unknown
410.7125		Unknown DES encryption
410.9125	P-25	Unknown
412.4250	P-25	Federal Detention Center
414.3000	P-25	Federal Detention Center
414.7500	82.5	USPS Postal Inspectors
416.6375	P-25	Input to 407.6375
417.5500	P-25	Input to 408.5500
418.7500	156.7	DEA F3, surveillance with FLINT 822
419.4375	P-25	Unknown

The frequencies labeled as EMWIN refer to the Emergency Managers Weather Information Network system. You can find out more at **http://houston.emwin.org/**.

Before Houston, I was in San Jose, California, for a few days and here is what I picked up:

163.0750		Paging – VA Medical Center?
163.3750	192.8	Unknown analog repeater
163.4875	P-25	Unknown encrypted
163.7750	CSQ	DHS Border Patrol
164.3500	146.2	Unknown analog repeater
165.2375	100.0	DHS Customs NET 1
166.4625	CSQ	DHS Common
168.5000	CSQ	USCG Marine Safety Office MSO-2 repeater
168.5250	206.5	Voice Paging
170.2250		Data - FAA or Hydrologic
172.9000	P-25	TSA @ SJC
413.6000	114.8	USPS Postal Inspectors - Analog w/DES
414.1500	114.8	USPS Postal Inspectors - Analog w/DES
414.7500	114.8	USPS Postal Inspectors - Analog w/DES
415.0500	114.8	USPS Postal Inspectors - Analog w/DES
417.7500	74.4	Unknown
418.3000	82.5	USPS Postal Police
418.7500	156.7	DEA F3 surveillance

And I'm often spending time in Las Vegas, so here is what was busy in "Sin City":

162.7875	P-25	FBI - possible input to 167.4625
163.1250	P-25	Hoover Dam Police
164.4500	114.8	Unknown - analog repeater
165.2875	P-25	ATF
166.3000	CSQ	Lake Meade National Recreation Area
166.7875	P-25	Unknown
166.9000	CSQ	Lake Meade National Recreation Area
167.4375	P-25	FBI - Encrypted
167.7625	167.9	FBI
168.5250	Unknown	
170.0500	CSQ	Lake Meade National Recreation Area
170.6260	P-25	Encrypted
170.7500	P-25	US Marshals Federal Courthouse
171.3625	88.5	Unknown
172.6000	CSQ	Lake Meade National Recreation Area
172.9000	P-25	DHS TSA @ LAS
406.7625	P-25	Unknown
407.1625	Unknown	
407.5000	Unknown	
407.5250	D023	Analog repeater, very military sounding
409.1625	P-25	Unknown
409.6375	P-25	Encrypted
409.7625	Unknown	
409.9625	P-25	Unknown
410.1625	P-25	Unknown
410.3000	Data	
411.6000	P-25	Unknown
419.5000	156.7	DEA surveillance

That's all for July, but the *Fed Files* will be back in September with more searching, scanning, and new frequencies!

Ron Walsh
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DX, Disasters, and Duty

Hi Ron. We are in Quebec City and are loading raw sugar for Toronto. Then it looks like we will head back down the Seaway to load ore for Burns Harbour.

Before we delve into this month's topics, I thought we'd take a quick scan over the latest traffic being heard here at my location in Ontario. The above conversation came from Ron, VE3RJB, who is on the Great Lakes freighter *Algosteel*. Ron can often be found on the Ontars Net, 3755 LSB before 0800. This is just one of the indications that summer is here and the shipping traffic on the Great Lakes is in full swing.

Of course, the VHF Marine radio is the main source of monitoring here and many channels are in use. Channels 11, 12, 13, and 14 are quite active and provide a great deal of information about the St. Lawrence Seaway and the ship traffic. Like most marine radio monitors, I am also a ship enthusiast and use the radio for information. I have been able to take photographs of two renamed ships this year as a result of information I got from monitoring.

I caught the *Maritime Trader* in the Welland Canal. Channel 11 was used to hear her arrival time at the canal entrance and channel 14 was used to follow her progress towards the best photo sites. Similar monitoring of channels 13 and 11 allowed me to catch the *Voyageur Independent* at the Iroquois lock of the Seaway. I can't emphasize enough how much the radio has allowed me to follow my shipping hobby! The camera bag also holds my amateur radio T-90A handheld, an Icom R-2 scanner and a small Cobra marine handheld radio. Of course, extra batteries fill one outside pocket.

I have already monitored some interesting VHF traffic. A salt-water vessel, the *Orna,* was aground west of Montreal. Shipping was suspended and some ships were requesting updates as they entered the Seaway. Three tugs were sent to pull the vessel off and remove her from the Seaway system. Heavy traffic on the Seaway has resulted in delays because there were no pilots available. Several ships have been anchored waiting for their river pilot.

Channels 8 and 10 are the most common ship to ship channels used by commercial vessels. Channel 6 is the most common ship to ship channel for all types of vessels. Channel 68 is used by all the Canadian marinas in this area.

The local Coast Guard vessel, CCGC *Cape Hearne,* has also been busy. They recently had a medical evacuation from the freighter *Algoisle*. The crewmember was transported to a hospital here in Kingston. Channel 16, 6 and 82A were used during this mission.

As a Coast Guard Auxiliary member, I occasionally get a chance to help aboard this vessel. I am going to be aboard when the Canadian Forces Snowbirds do an aerobatic display over Kingston Harbor. We actually provide a focal point for their display. Besides being the best seat in the house, there is usually some interesting radio monitoring. Again, channel 82A will probably be used.

❖ Scanning Tips

Perhaps this is a good place for a reminder that when you have a channel such as *82A*, that means you are listening on the lower of two frequencies of a duplex marine channel. This will be the 156 to 157 MHz range of a frequency pair as seen in a marine frequency chart. To get the proper channel on a marine radio, you need to switch from the International (I) setting to the US (U) or Canadian (C) setting on your radio. That converts some of the channels into the appropriate simplex channel.

If you have *83B* in use, such as for Canadian Marine weather, you will be listening on the higher frequency of the duplex pair, which is in the 161 to 162 MHz range.

Scanning the marine channels in your area will certainly produce a list of active channels. For instance, my monitoring in Georgetown, South Carolina, showed tugs on channel 13, bridges on channel 9, and some fishing boats on channel 68. I am presently researching some frequencies for New York City. I would appreciate your list of local frequencies, HF or VHF – wherever you may be!

Hot summer weather often produces temperature inversions or ducting, which will allow you to monitor VHF radio at extended range. A good method of predicting these occurrences is to monitor the NOAA and Environment Canada weather frequencies. These are just above the marine band in frequency. If you hear weather radio from beyond your local area, it is a good time to check the marine VHF for long-range openings.

Also as a reminder, with summertime comes the amateur radio flea market season, and some real bargains may be had. I picked up two 6 dB gain, 150 MHz antennas, brand new in boxes, for $10 each. These are about to be installed on my new tower mount.

❖ HF DX

Now that we have longer days here, the HF marine frequencies open up later and for a shorter time. My spring monitoring produced some interesting DX catches. The tug *Patriarc* was monitored on 4149 USB as well as other Crowley Marine vessels. 5320 USB was used by the USCG *Kennibeck*. This is listed as a USCG tactical frequency. 5399 is another such frequency. A list of suggested frequencies for the USCG is included below and reader input on these would be appreciated.

WLO Mobile was noted on 8420 with a CW ID and digital pulses. NMN was also noted on 8427.3 with a CW ID. For the Great Lakes HF monitor, I finally heard the USCG in Travers City, Michigan, on 5696 USB. They were talking to CAMSLANT Chesapeake and then I heard a "Trailer 5" doing a radio check. The Canadian East Coast Marine stations were heard on 2182, 2598 and 2749 kHz USB with announcements and weather broadcasts.

For Canadian Search and Rescue activities, 5717 is the primary frequency. Perhaps the best catch was USCG *Kodiac Alaska* on 5696 when they replied to a radio check. This has made me decide to improve my low frequency antenna, and an Alpha-Delta sloper is being installed as this column is being typed. I have also raised my tower about 4 feet to gain a good angle for the antenna. A dipole and an R-7 vertical served the station this winter. Good results were obtained with both antennas.

With much perseverance, a contact was made with the 3Y0X Antarctic area DXpedition using 18 MHz CW.

❖ Emergency Duty

It is amazing the places you can find radio

The John Spence and McAsphalt barge is above lock 2 of the Welland Canal, in March 2006.

The Voyageur Independent is at Iroquois Lock.

frequency information. The Discovery Channel had a recent program called the *Deadliest Catch*. This is about the dangerous crab fishing industry on the Bering Sea. By watching carefully, it was possible to see some of the VHF marine channels they were using when the radio sets were shown. I also heard them say that the announcements about the closing of the season would be made on 4125 USB. That is another good frequency to monitor.

This is a dangerous occupation and several incidents were shown. They had crew overboard and even lost a ship with its entire crew. Such events are not uncommon in this line of work. I had just watched an episode and had gone down to my radio shack to do some listening when I heard the automated marine weather from Kodiak, Alaska, on 6501 USB. It was audible from 0305 until 0330 UTC when CAMSLANT Chesapeake came on the same frequency. I could hear both stations well. Gale Warnings for the Bering Sea and other bad weather brought home the reality of the TV program and made it even more meaningful.

As all radio enthusiasts know, any one of you may be the person who hears a distress call and is able to help. In our area, a lady near Cape Vincent, NY, had a scanner on early in the morning. She heard a short Mayday call and reported it to the Coast Guard. She only heard one call and was the only person to hear it. Both Canadian and US emergency services were notified and a fireboat from Clayton, NY, found four very cold survivors on a very small rock island.

I am an instructor for Marine Radio licenses and, of course, train people to listen to any distress call for information. It may be the only call made and you may have to relay the message or assist the vessel. It is our duty to monitor while on board ship, but every listener should also be ready to monitor emergency traffic.

I was reminded of this as I gave WX4NHC a radio check on 14.300 USB. This is the station for the National Hurricane Center in Miami, Florida. The Hurricane season started June 1st, and predictions are for a season similar to last year. I remind monitors and amateurs that the Hurricane Net is activated on 14.325 USB for every tropical storm. This is a great source of information and you may be able to help with traffic, relays etc. The Maritime Mobile Service Net on 14.300 is also a good source of information. Having operated HF and VHF during our severe 1998 ice storm, I appreciate how much help amateur radio can be.

I could not help but be saddened by the sinking of the BC Ferries' *Queen of the North*. Having been in Prince Rupert BC last summer and having seen the vessel, it really struck home. A teaching acquaintance actually served for two months on the vessel. *MT* subscriber John Musgrave of Oona River, BC, was in Dodge Cove when the incident happened. Dodge Cove is at Digby Island, near Prince Rupert. He sent the following information:

The vessel was traveling from Prince Rupert to Port Hardy and was off course when it hit rocks at 19 knots. Even though it was early morning, the Mayday call was picked up in the nearby village of Hartley Bay. This community has no road access so everyone has a boat. Many of the people there have marine transceivers at their home and monitor the distress channel, 16. The fast boats were on the scene in 20 minutes and the slower fishing boats took about an hour. All but two people were rescued and were given shelter in the little community. (*I help teach a MED, Marine Emergency Duties, course, and you can imagine how many might have been lost to hypothermia etc. if they had been there for a long time--rw*) The survivors were transported back to Prince Rupert by the Coast Guard ship *Sir Wilfred Laurier*.

John also reminded me that the *Queen of the North* was a sister ship to the *Estonia* which sank in the Baltic years ago. Although it is not legal to operate a marine radio from land, in remote coastal villages it sure shows that monitoring the radio can save lives. It also proves that a marine radio is a necessity on a boat. As I teach in my course, every equipped vessel and any person who monitors marine radio can hear your call for help.

The Maritime Trader is at Lock 7 of the Welland Canal in March 2006

❖ Equipment Changes

The second section of a marine radio course I am teaching is on the Global Maritime Distress and Safety (GMDSS) system. The main part of this which applies to pleasure craft is the DSC (Digital Selective Calling) marine radio. Channel 70 has now been reserved for DSC and DSC radios are being sold in the stores. In fact, I did not see a radio without DSC at the local marine supplier.

It is interesting to note that the new Ontario Boating Safety Guide recommends that people buying a new marine radio buy one that is DSC capable. I actually bought one for demonstration in my radio classes. A red distress button indicates that a radio is DSC equipped. It is expected that one Coast Guard communications station on the Great Lakes will be DSC equipped this year.

I have also been changing my radio shack antenna configuration. With help from George VE3GHK, Bert, VE3KBW and Jim, VA3JHR, the R-8 vertical, tower, and guy ropes were erected. Contacts with the United Arab Emirates and the island of Mauritius show the antenna is working.

New coaxial cable is being installed and I have raised new scanner antennas. George has also helped me install a computer dedicated to the radio station. Digital transmissions are my next target. I certainly plan to be ready for the winter HF DX season. However, now I must solder lots of connectors on RG-213U cable!

- 73 Ron VE3GO

❖ Useful Frequencies

Environment Canada and NOAA weather channels (MHz):

162.400, 162.425, 162.475, 162.500, 162.525, 162.550

USCG Aviation Frequencies (kHz):

Key West, Fla. tactical	4716.6, 10993.6
Clearwater, Fla. Station	4990
San Juan, PR	8301.6
Miami, Fla.	10608.1
Safety of Flight	5696 Night Primary 8983 Day Primary 11202 Day Tertiary 15088

VHF Marine Channels (MHz) mentioned in this column:

Channel 6	156.300
Channel 8	156.400
Channel 9	156.450
Channel 10	156.500
Channel 11	156.550
Channel 12	156.600
Channel 13	156.650
Channel 14	156.700
Channel 16	156.800
Channel 68	156.425
Channel 70	156.525
Channel 82A	157.125

BELOW 500 kHz

DXING THE BASEMENT BAND

Kevin Carey, WB2QMY
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Summer Fun on LW

We extend our apologies for the repeated column in the June issue. The intended June column has been updated for July.

Welcome to the July issue of *Below 500 kHz*. Conventional wisdom holds that we are now entering the time of year when longwave work becomes difficult, if not impossible, due to static "crashes," longer hours of daylight, and generally poor propagation. I would counter that the warmer months present opportunities for LW fun not easily found at other times of the year.

Tracking down your local beacons is an interesting way to spend a summer afternoon. Using triangulating techniques, you can locate your quarry with nothing more than a portable LW receiver and a map. If you hear a strong signal that does not vary in strength from day to night, chances are it is of local origin. Don't forget to bring your camera along. You could see your catch featured here! Just be sure to observe all posted signs and do not get too close. The post-9/11 era could turn you into a suspect rather quickly.

Planning a summer vacation? The warmer months offer a perfect opportunity to make some new-to-you loggings while on the road. After months of hearing the same stations from your home QTH, it can be quite refreshing to fill up your log with some new intercepts. Again, all you need is your portable receiver and some fresh batteries.

Will your summer travels bring you near the Rochester, NY, area? If so, be sure to check out the Antique Wireless Association museum in Bloomfield, NY. I serve as a guide there, and it would be my pleasure to give you a personal tour, with an emphasis on longwave, of course. This year, I plan to be on duty July 30th and August 27th from 2-5p.m. Drop me a line if you are able to stop by. Full information on the AWA museum is available online at **www.antiquewireless.org**.

Figure 1. The AWA Museum (Bloomfield, NY) is open for the 2006 season. It offers a treasure trove of longwave exhibits.

Portable receivers are not just for taking to the road. Summer inevitably brings with it a few local power outages, and you'll want to be sure your portable is ready to go for these rare opportunities. With the usual interferers "off the air" (motors, TVs, electric fences, etc.) you might be pleasantly surprised at what you can hear. These outages typically don't last for long (thankfully), so don't waste any time adding catches to your log.

Finally, summertime presents great opportunities to visit local hamfests and swapmeets where you might find some longwave goodies. Even if your find is a "project radio," you will have plenty of time to get it ready for the peak season coming later in the year.

As you can see, summer is not a time to hang up the headphones on the low frequencies – you just need to be a bit more creative.

❖ Mailbag

MT readers have been busy with their own activities and have written with several updates. First, we are pleased to hear from Hans Hildebrand, WA1UFO (NH). Hans included the beacon logs below, for which I've supplied location information. He wonders how one can ID the beacons they hear.

There are numerous online sources for this information. Two of my favorites are the World Aeronautical Database and Airnav.com. Many listeners still prefer the convenience of a printed guide, and if this interests you, my *BeaconFinder II* directory is available by mail order. See Page 67 for details.

Table 1. Beacon Loggings from NH

Freq.	ID	Location
289	YLQ	La Tuque, QC
303	YPP	Parent, QC
326	FC	Fredericton, NB
340	YY	Mont Joli, QC
378	RJ	Roberval, QC
390	JT	Stephenville, NL
332	YFM	La Grande, QC
360	PN	Port Menier, QC
366	YMW	Maniwaki, QC
248	UL	Montreal, QC

Don Schimmel (WV) wrote asking about two unidentified beacons – BUH (260 kHz) and TST (350 kHz). I show BUH as being near Baltimore, associated with the Anne Arundel air facility. TST is likely an FAA test beacon, soon to be assigned a permanent ID. Years ago, this ID was commonly heard near the Oklahoma City, OK, headquarters of the FAA, but in recent years it has been heard in the field, in advance of the commissioning of a new beacon. Don, please keep us posted on this one if a new ID is heard.

Tom Sevart, N2UHC (KS) built the Natural Radio receiver described in the February and March issues of *Below 500 kHz*. After many years of hearing about these signals, he decided to put the circuit together using a few of his own modifications and improvements. For example, instead of an external audio amplifier, he went ahead and built one right on the board using a Motorola MC34119 chip and some extra parts. He also installed two jacks, one for headphones and one for a tape recorder, and used an audio transformer he had on hand in place of L1. Finally, instead of using a 2N3819 transistor, he used an MPF102, which is very similar in characteristics.

Similar to my experience, Tom picked up electrostatic signals with his BBB-4 receiver, but in his case it resulted from petting his dog on the head, not walking through the snow! Next, he plans to do some more testing in a wilderness area near his home. Tom has made a web page detailing his version of the receiver, and you can check it out at **www.geocities.com/n2snaturalradio/index.html**. You can see pictures of his finished design, and hear a sound file of the RF he picked up when petting his dog. (This may qualify as the most unique form of Utility Monitoring ever!) Tom plans to post additional sound files of natural radio signals as he hears them.

That's it for July. See you next month!

Figure 2. Tom Sevart (KS) built this Natural Radio Receiver based on plans from the February and March issues of Below 500 kHz.

OUTER LIMITS

THE CLANDESTINE, THE UNUSUAL, THE UNLICENSED

George Zeller
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Pirate Radio Humor for DXers

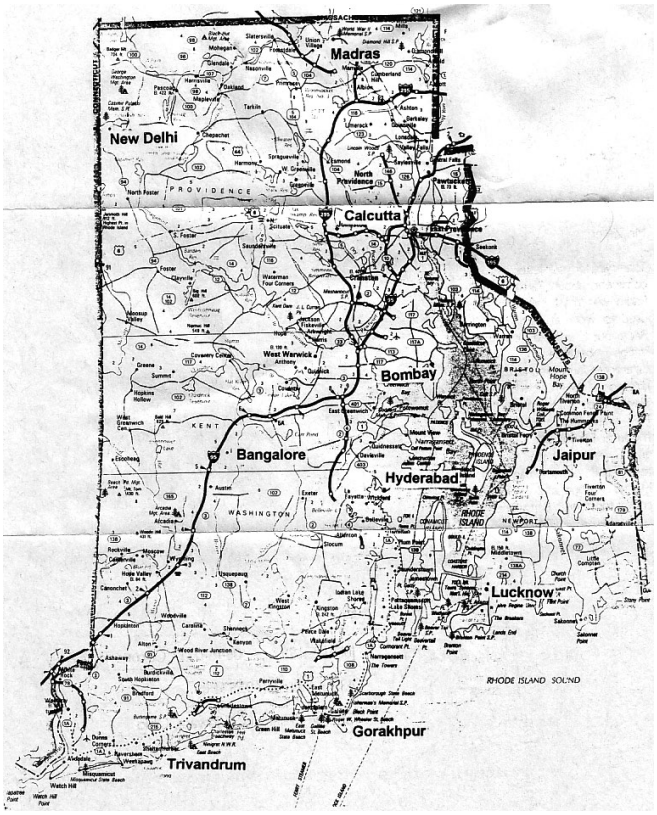
The editors apologize for the repeated column in the printed edition of the June issue. You will find the correct June Outer Limits text (which ran in the MT Express edition) posted for download or print-out at www.monitoringtimes.com/html/mtouter0606.pdf

Most pirate DXers have been familiar with the standard North American shortwave radio pirate programming format for a long time. Many stations feature rock music mixed with comedy. Of course, pirate station formats are as varied as the station operators themselves. With no rules to guide the process, a pirate station produces whatever format seems appropriate to an individual who programs the station. This leads to formats of all kinds, most of which cannot be heard on licensed shortwave or medium wave and FM broadcasting stations in North America.

But, comedy tends to dominate many pirates through long tradition. The comedy material varies considerably. Often it is in good taste, but sometimes it is not. In addition, humor about the radio monitoring hobby is a staple of the comedy on many pirate radio stations. Sometimes it is subtle, and at other times it is highly complex.

This month we feature the reverse side of the QSL from **Indira Calling**. As we see here, it is a map of Rhode Island, where the station used to have its maildrop. The map locates many of the major cities of Rhode Island, including the capital Calcutta on Interstate 95. Bombay and other important transmitter sites and receiver manufacturing locations such as Jaipur, Bangalore, and New Delhi are located on the map as well.

Humor like this is hardly going to run Jay Leno and David Letterman out of business, but it does remind us that pirate radio stations can be clever and entertaining. Further, you will never get a QSL from the Voice of Russia or the Voice of America like this one!



❖ Radio Insurgente Transmitter?

A bout of speculation on the transmitter location of the Mexican Zapatista rebels' clandestine **Radio Insurgente** has broken out in the DX hobby. This is one of those juicy targets that leads us to think about such things. Some have proposed that maybe it is coming from a Cuban transmitter, but based on the fact that this station has now been heard by many Florida DXers in various locations, it seems to many (including our reporter Bob Wilkner) that it is likely that this one is actually coming from a clandestine location within Mexico itself. The next step in this saga will be an attempt at amateur direction-finding on the part of DXers.

That will remain difficult, however, since the station is still operating a schedule around 2300 UTC on 6000 kHz slightly variable. During the summer months, that frequency will be inaudible in most of North America at this time of day. So, the Mexican rebels are establishing a radio voice, but it seems clear that they are not interested in a wide geographic audience. A broadcast around 0200 would have a much larger potential audience, but the station engineers have chosen not to do that so far.

Many clandestine stations in the past generated similar speculation. For instance, the old Basque anti-Spain clandestine **Radio Euzkadi** was actually transmitting from a point to point utility transmitter in Venezuela, but during the 1960s, DXers never did discover its true location.

❖ Oldest QSL

MT reader Kraig Krist currently is leading in our quest to find the oldest pirate QSL in our collections. He has a **Radio Dublin** QSL from November 1981. He had an earlier logging of **WPOT,** but no QSL materialized for that one. Can any of you claim an older QSL in your collection?

❖ What We Are Hearing

Monitoring Times readers heard twenty different North American pirates this month. 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. Both Memorial Day and the 4th of July are major holidays under this definition.

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.

Channel Z Radio- Their rock music continues from transmitters on both sides of the Atlantic. (Blue Ridge Summit)

MAC Shortwave- Paul Star is using an oldies rock music format with legitimate old radio jingles. (*macshortwave@yahoo.com*)

North Woods Radio- This new one mixes rock music with animal sound effects from out in the woods. (*northwoodsradio@yahoo.com*)

Pirate Radio Boston- As their name implies, the rock music on this station has a New England focus. (Stoneham)

Progressive Music Radio- This one is not new at all. Dr. Benway has revealed that he operated this pirate back in the 1980s. He now has resurrected some of the old shows. (Merlin and *undercoverradio@mail.com*)

Radio Beaver- This old timer has returned with Canadian humor. (Merlin)

Radio First Termer- This documentary about rock music broadcasts in Vietnam during the war is often relayed on the pirate bands. (None)

Radio Pigmeat International- Pigmeat Martin still combines rock and blues music on his broadcasts. (*pigmeat_voab@yahoo.com*)

Radio Six- This rock music station has joined the stable of stations that use numbers for their name. It occasionally gets a relay on licensed stations such as **WBCQ**. (None)

Take It Easy Radio- The signature tune on this station is by The Eagles in the station name, but they also feature rock by other artists. (Merlin)

The Crystal Ship- The Poet's still offers leftist political commentary on "Voice of the Blue States Repub-

Continued on page 61

T.J. "Skip" Arey, N2EI
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Show Your Stuff

It is self evident that it is the assigned task of this humble ham radio columnist to give you folks a good idea or two about how to play amateur radio. However, I also try to find ways to impart to you, dear *MT* reader, the motivation and, if possible, some tools to forward the continued growth of the greatest hobby in the world (and beyond it). If I can get you folks to turn a few more people on to the joys and wonders of amateur radio, I can head into my shack secure in the knowledge that there will be even more folks I can rag chew with on the bottom end of 40 meters.

Over the years I have discovered that one thing about my radio interest consistently proves to be an attraction to those sadly uninitiated people who come to my home. A non-ham may simply smile politely at your radio collection. They may nod, feigning appreciation, as you tell of your latest attempt to add Radio Freedonia to your log book. They may even patiently sit by (albeit gritting their teeth) as you fire up your rig to a show of bottom of the cycle static.

Yet, when I break out the QSL card collection, polite interest almost always turns into genuine attention. There is something about the sight of those hundreds of colorful pieces of paper from all over the world that draws folks into a place where I can begin to talk to them about joining in on the ham radio fun.

Pondering the "show and tell" nature of a QSL card collection was brought home even more intensely for me recently when I was asked to become the steward of the QSL card collection of a recently deceased fellow ham (see last month's column).

Going over this gentleman's collection of verifications from the four corners of the world was a celebration of this man's amateur radio career. His cards mainly resided in a couple of shoeboxes. But it wasn't long before the wheels started turning in Old Uncle Skip's head as to how I might display this collection of cards in a manner that would both honor his memory and perhaps excite a few folks about ham radio.

It wasn't long until I also began thinking about better ways to "put my stuff on the street" as well. How could I make my QSL card collection into something I would be truly proud to show to folks when they stopped by the radio shack? Let's run a few of these ideas up the tower and see what happens.

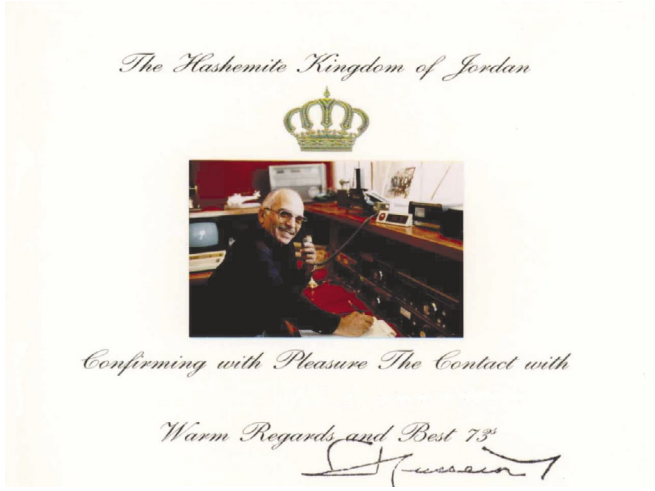
First Things First

What was it the King of Hearts said to the White Rabbit in Alice in Wonderland? "Begin at the beginning." If you are going to create a first rate QSL card display you must first, as they say, put your cards on the table. Gather all your cards into one place to see what might make for a good display. For some folks, this will mean cleaning out a drawer, file cabinet, or picking through a shoe box or two.

I guess you could call me semi-organized. Over the years, I have placed my cards into sleeved postcard scrapbooks (available in many office supply stores) more or less as they came in the door. The only further organization is that my scrapbooks are broken down between the categories of Domestic and DX cards and well as QRO and QRP. The reason I did this was mainly for tracking my progress toward the particular awards I was interested in. Being able to identify when I had the goods to apply for WAS, WAC, DXCC and then their QRP endorsements was my main personal motivation for gathering the card collection in the first place.

So, taking these books down from the shelf and going through them with an eye to telling the uninitiated world about ham radio wasn't too complicated a task. I started to formulate ways I could use the cards to tell a particular kind of ham radio story.

I began to think about how presenting the cards in smaller combinations might make them more palatable to non-hams. Given my use of postcard sleeve scrap books, it was just a matter of moving cards around into more interesting assemblages for my non-ham friends to enjoy.



If you were fortunate enough to work JY1 during your ham radio career, you may want to display King Hussein's card prominently.

Turning Big Collections into Small

One of the first things that jumped out to me was a small grouping that I call "Places That Ain't There Anymore." All told, I had in my collection about half a dozen cards from entities that are no longer sovereign countries. For example, the German Democratic Republic (DA through DM) and Czechoslovakia (OK) are fairly common cards in a pre 1990 ham's collection. However, they don't really appear on maps any more. I find non-hams to be fascinated by this.

Similarly, you might put together a grouping of "new" countries such as Slovenia (S5) and Bosnia-Herzegovina (T9). While these cards may not reflect any level of amateur radio skill (you can work S5's on your teeth fillings during a contest weekend), they do present something about the world to the non-ham. They also show that you actually talked with someone, sometime, from these old or new places. (And you did it without incurring any roaming charges on your cell phone, either.)

Another grouping I pulled together was a collection of the same card from the same ham, but on each of the different amateur radio bands. I was somewhat surprised to discover that this was more common than you might think. I have built "all bands" collections of this sort with four different stations: three domestic and one DX entity. On a busy contest weekend, you can usually find some of the big contest clubs on all bands. This kind of collection is seen as an interesting curiosity by non-hams and it can lead to a discussion of how the shortwave spectrum works differently from the domestic broadcast services. But before they glaze over, move on to another card collection.

I found I have dozens of cards in my collection that show the sending ham sitting at his or her personal station. Grouping these cards together gives me the opportunity to show people the different kinds of equipment hams use to enjoy the hobby. Come to think of it, it also shows the different kind of people that enjoy our hobby as well. And no doubt about it, the smiling operator's faces in the pictures are generally good PR for the hobby.

Similar to the above, and also subject to a separate display is what I call "Trains, Planes and Automobiles." This is a collection of those QSL cards

that came my way with transportation related graphics. There are lots of ham pilots, so pictures of planes show up from time to time. (I even have cards showing hot air balloons and the Goodyear Blimp.) Of course, many hams are also train hobbyists. More than one ham has sent a card with a picture of himself standing next to his car. Get the idea? Groups begin to come to mind as you go through your QSL collection.

A variation on this theme might be some of the "Themed" Special Events Stations. Hams often activate stations from lighthouses, battleships and submarines. Other possibilities are groupings of cards from Special Events stations associated with the Olympics. These groupings appeal to the non-ham because they are usually related to events about which they have some basic knowledge. It is all about showing them the world through the slightly different eyes and ears of amateur radio.

You may have seen my column some time back on Famous Amateur Radio Operators. An updated version of this list can be found at **www.scannerscum.com/skip/skiparticle4.html** If you happen to have had the pleasure of working somebody newsworthy or famous during your ham radio career, by all means, let your non-ham friends know about it. Maybe frame the QSL card with a picture of the person or display it in a scrap book with newspaper or magazine articles about the famous ham. When you get to tell non-hams about such contacts their eyes light up.

Another grouping I made was a collection of cards from longtime friends and fellow travelers. This actually raises more interest with non-hams than I initially expected. The reason for this is that my non-ham acquaintances have either met or heard me talk about most of my ham friends from time to time. When you can say "This is Jon, remember him? You met him at the 4th of July picnic," it adds context to our hobby for the uninitiated.

❖ Award-Winning QSLs

If you have worked WAS, WAC or DXCC, you might display the cards in a manner to communicate how important this effort was for you. You could display the cards in the order you worked the stations. You may place them in alphabetical order by state or DX entity. I remember seeing one ham's shack where he had his 50 WAS cards displayed on the wall neatly around his WAS certificate.

Something I did in my shack was a little less dramatic, but it does draw the non-ham's eye. One of the awards I am most proud of as an active QRPer is my 1000 Miles Per Watt Award. My certificate was issued for working V73CW (Marshal Islands) with 5 watts on 20 meters (sideband no less!!). I display my certificate of this achievement in a frame with the QSL card from Bruce AC4G the station op. When you start to tell people how you communicated half way around the world with less power than a Christmas Tree bulb, they start to take notice.

And related to the above DXCC collection, remember, it doesn't hurt to slip out of the amateur radio mindset when making your QSL card groupings. If you are planning to show your cards to children, maybe a grouping of your most brightly colored cards will draw their attention. I had always kept my 100 DXCC cards in one grouping. But, as anyone who has chased this award knows, it is not all that uncommon to get some fairly plain looking, no frills QSL cards during the pursuit of DXCC.

So what I did was build up a collection of as many different countries (entities actually) as I could, using the more colorful cards that came my way. Since I have gone some distance beyond my original 100 countries in my ham radio career, it wasn't all that hard to bring together a very colorful presentation of "Cards from Different Countries." This collection will make the non-hams you know understand a bit more about the fun of "working the world," but more importantly, it gives them a colorful graphic presentation of the larger world around themselves.

❖ Do Your Part

This may be a good place to get up on one of my favorite ham radio soap boxes. Folks… nobody likes a dull looking QSL card! If you are going to show the world you enjoy this hobby, why not make it clear in the QSL card you send out? It used to be difficult and expensive to get colorful and interesting QSL cards printed. But we live in the modern world of the personal color printer coupled with software tools like Adobe Photoshop. Make something up that is going to stand out in someone else's QSL card collection. Think of it this way: you are not just verifying a contact, you may be contributing to getting a new person excited about ham radio. Even if you just want to use black ink, at least print the QSL out on brightly colored paper.

All I have done is toss out a few simple ideas on how to show your friends the joys of ham radio through the wonders of your QSL card collection. I am sure it won't be hard for most of you to come up with many more creative ideas. Have fun! I'll see you on the bottom end of 40 meters. And I QSL 100%!

UNCLE SKIP'S CONTEST CALENDAR

RAC Canada Day Contest
July 1, 0000 - 2359 UTC

Original QRP Contest
July 1, 1500 UTC - July 2, 1500 UTC

MI QRP July 4th CW Sprint
July 4, 2300 UTC - July 5, 0300 UTC

IARU HF World Championship
July 8, 1200 UTC - July 9, 1200 UTC

FISTS Summer Sprint
July 8, 1700 - 2100 UTC

QRP ARCI Summer Homebrew Sprint
July 9, 2000 - 2400 UTC

North American QSO Party, RTTY
July 15, 1800 UTC - July 16, 0600 UTC

CQ Worldwide VHF Contest
July 15, 1800 UTC - July 16, 2100 UTC

RSGB IOTA Contest
July 29, 1200 UTC - July 30, 1200 UTC

Outer Limits continued from Page 59

lic" on 6875 kHz and other variable frequencies such as 1710, 3320, 6854, 6925, and 9057 kHz. He's been around for decades. (Belfast and *tcsshortwave@yahoo.com*)

Undercover Radio- When you hear Dr. Benway's recent shows featured an entertaining two decade history of his operations "from the middle of nowhere." (Merlin and *undercoverradio@mail.com*)

Voice of Captain Ron Shortwave- Their programming is rock music hosted by Captain Ron himself. (*captainronswr@yahoo.com*)

Voice of the Runaway Maharishi- Captain Ganja sometimes moves his comedy and drug advocacy station to the Asian subcontinent. (Belfast)

WBNY- Commander Bunny still is the general of the rodent revolution, which features Easter music (in and out of season), yodeling, and digital and voice broadcasts. (Belfast)

WBZO- This station specializes in making fun of certain DXers, sometimes with a Canadian **CBZO** call. (Belfast)

WEAB- Although not widely heard, their bugle call at sign-on distinguishes them from other rock music pirates. (None announced)

WHYP- The hamlet of North East, PA remains the mythical location of the James Brownyard memorial pirate. (Belfast and *whypradio@gmail.com*)

WMPR- Their "dance party" techno music format continues on a regular basis in the pirate bands. (None; has QSLed only at the Winter SWL Festival)

❖ QSLing Pirates

Reception reports to pirate stations require three first class stamps for USA maildrops or $2 US to foreign locations, especially in Europe where the value of the US dollar has plunged considerably. 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 69, Elkhorn, NE 68022; PO Box 146, Stoneham, MA 02180; and PO Box 293, Merlin, Ontario N0P 1W0.

Some pirates prefer e-mail, bulletin logs or internet web site reports instead of snail mail correspondence. Since the demise of *The ACE*, the best bulletin for submitting pirate loggings with a hope that pirates might QSL is now the e-mailed *Free Radio Weekly* newsletter, free to contributors via *yukon@tm.net*. A few pirates will sometimes QSL reports left on the Free Radio Network web site, at **www.frn.net**

❖ 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; Dave Balint, Wooster, OH; Kirk Baxter, North Canton, OH; Artie Bigley, Columbus, OH; Dean Burgess, Manchester,MA; Jerry Coatsworth, Merlin, Ontario; Gerry Dexter, Lake Geneva, WI; Rudy Elsen, Castro Valley, CA; Bill Finn, Philadelphia, PA; Harold Frodge, Midland, MI; William T. Hassig, Mt. Prospect, IL; Harry Helms, Smithville, TX; Kraig Krist, Manassas, VA; Harald Kuhl, Germany; Ed Kusalik, Coaldale, Alberta; Chris Lobdell, Stoneham, MA; Greg Majewski, Oakdale, CT; Larry Magne, Penn's Park, PA; John Poet, Belfast, NY; Martin Schoech, Eisenach, Germany; John Sedlacek, Omaha, NE; Lee Silvi, Mentor, OH; Matthew Westendorf, Cleveland, OH; Bob Wilkner, Pompano Beach, FL; Mike Wolfson, Ashland, OH; and Joe Wood, Greenback, TN.

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Yagi-Uda Beams for HF, VHF or UHF

Beam antennas are sometimes quite useful in improving communications under less than ideal conditions. On the other hand, when conditions are good, they sometimes add little to your ability to communicate. Let's consider why this is so. Then, if it seems that a beam would be of use to you, you can check out the plans below on making your own beam antenna.

❖ Transmitting versus Receiving

Transmitting:

As compared to a non-directional antenna, the use of a beam antenna such as the Yagi-Uda can direct more of a transmitter's RF power in the direction you want it to go. For a given level of RF power, this focusing of your transmitted energy will sometimes increase the distance over which you can communicate. For example, say that the signal a transmitter puts into a distant station isn't quite strong enough for good reception at that distant station. Then this focusing of the transmitter's output, without increasing the transmitter's power output, may make the needed difference to achieve good communication. In addition, the focusing of more of the RF energy into a desired direction leaves less to be launched in non-desired directions. This reduces the likelihood of interfering with communication in which your station is not involved.

Receiving:

First, consider the case where the signal you are receiving is relatively strong and is not being interfered with by received noise or other signals. This condition will produce a good signal to noise ratio (S/N). Although the signal strength delivered by a beam is usually higher than that available from a non-beam antenna, the beam may only produce an increased S-meter reading without much difference in quality of reception. The automatic gain control circuitry in your receiver may adjust your receiver's audio output such that you hear signals about the same with a beam as with a lower-gain, non-beam antenna.

Beam antennas do offer greater signal strength to the receiver than non-beam antennas. However, whether this greater gain improves reception is dependent on the amount of noise received along with the signal on the operating frequency. If the received noise level is higher than the noise produced in the receiver's circuits, then the S/N is essentially determined by the ratio of signal and received noise present at the antenna. Thus, greater antenna gain doesn't materially improve reception. However, if received noise is less than that produced by the receiver's circuits, then the S/N will be improved if there is greater signal output from the antenna.

If the signal you are receiving is experiencing interference, a beam antenna may be helpful. If the noise is in the form of interference from a station or other noise source which is not located in the same direction as the desired signal, a beam can provide improvement by increasing the signal strength from the desired direction and diminishing reception from the sides and rear of the antenna.

❖ Let's Make One (or More)

Let's make a Yagi-Uda beam or two. The method of construction will vary with your site and the materials you choose to use. On HF or the upper MF frequencies, the easiest method of construction is to string wire elements between insulators as shown in fig. 1A. Although this is probably the easiest way to make an HF beam, the downside is that it is fixed to favor one direction and cannot be easily rotated.

For the top half of the HF band, ele-

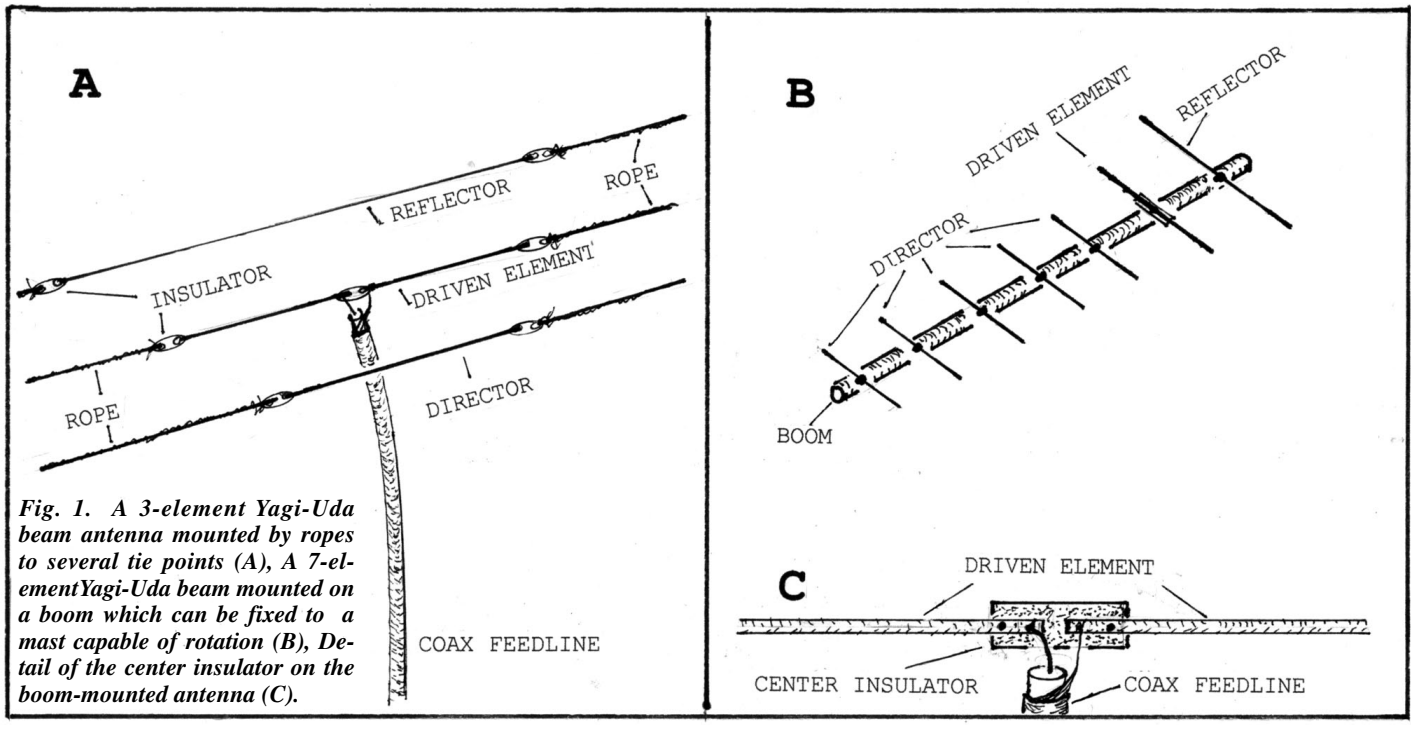


Fig. 1. A 3-element Yagi-Uda beam antenna mounted by ropes to several tie points (A), A 7-elementYagi-Uda beam mounted on a boom which can be fixed to a mast capable of rotation (B), Detail of the center insulator on the boom-mounted antenna (C).

This Month's Interesting Antenna-Related Web site:

This site gives a description of Yagi-Uda beams: **www.accessscience.com/Encyclopedia/7/75/Est_752600_frameset.html?doi**

Here you'll find info on building Yagi-Uda antennas: **www.repairfaq.org/filipg/LINK/yagi.html**

ments are short enough to allow construction of beams small enough to be rotated atop a tower. Above about 300 MHz it is practical and relatively easy to construct the beam on a boom so that the beam can be aimed by rotating the boom (fig. 1B). At these frequencies, self-supporting elements can be made of heavy wire such as aluminum grounding wire.

The boom can be wood and should be given two coats of varnish if it is used outdoors. If you use a metal boom, then the driven element must be insulated from the boom as shown (Fig. 1C). The other elements may just be attached to the metal boom at their center point.

Although 50-ohm coax doesn't match the antenna's feed point, it works well as a feed line if you use good-quality line of 50 ft or less (VHF-UHF) or 100 ft or less (HF-MF). Connect the coax center conductor to one side of the driven element, and the outer conductor (shield) to the other as shown. Seal the coax end at the antenna against weather with some type of coax sealant. Wrapping the coax tightly with black plastic tape will usually seal it sufficiently for short-term service.

Dimensions for a three-element beam (F = frequency in MHz; L=length) are as follows:

Reflector L(ft) =491/F, L(m)=150/F
Driven element: L(ft)=468/F, L(m)=143/F
Director: L(ft)=445/F, L(m)=136/F
Spacing: S(ft)=98.4/F, S(m)=30/F

Dimensions for the seven-element beam:

Reflector: L(ft) = 445/F, (m) L = 136/F
Driven element: L (ft)= 426/F, (m) 130/F
Director: L (ft) = 411/F, (m) L = 125/F
Spacing: L (ft) = 295/F; (m) L = 90/F

For example, a driven element at 14 MHz would have a length of: 468/14 = 33.4 ft.

Mount the beam as high as is practical. The lower the frequency the higher the beam should be mounted. I've used a 20-meter wire Yagi-Uda mounted something like 15 or 20 feet above the ground and had good DX performance with it. However, for the HF band something like 40 feet is sometimes called the minimum for good results.

At VHF and higher, it's good to have the beam high enough so that there is almost a line of sight from your receiving antenna to the desired transmitting site's antenna. HF and MF beams are usually mounted with elements horizontal, but vertical polarization is so common above the HF band that antennas for VHF and UHF often have their elements oriented vertically.

RADIO RIDDLES

Last Month:

The riddle said: "Waveguides are used in microwave work to route radio waves from transmitter to antenna, or antenna to receiver. They are designed to guide the waves without leaking any out along their route. Yet a leaky waveguide can be of value in certain antenna applications. How is this true?"

Well, waveguides and coaxial cables are sometimes designed to be antennas by deliberately causing them to leak RF energy. Waveguides can have slot openings, or other openings to leak RF energy in a desired radiation pattern. For instance, leaky coax or wave-guide antennas can be used to distribute low-power signals within large buildings or along a length of railroad track to communicate with moving trains. One quite novel application is using a leaky waveguide as a sensor to detect bacteria!

This Month:

The length of the driven element of a Yagi-Uda beam is such that the element resonates at the frequency on which it is designed to operate. The driven elements discussed above are shorter than the reflectors, and longer than the directors. But all the elements are intended to respond to the same frequency, so why are they different lengths?

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.

Marc Ellis
marcellis@monitoringtimes.com

The "Little Fellow" Finds its Voice

For starters this month, I owe a thank-you to reader Mike Ostrowski. Mike has a Sears Roebuck service manual containing schematics and parts lists for all Silvertone radios built from 1928 through 1936. He was kind enough to send me scans of the pages for the Model 1728A – which enabled me to confirm that my Silvertone "Little Fellow" is indeed that model, even though it is installed in a cabinet normally found on the earlier Model 1703 "Little Fello." Maybe Sears had a stock of the old cabinets to be used up before switching to the new design.

Mike also included a copy of Sears' radio source list. Using it, I found that the initials "C.R.C." on the decal at the back of the set must mean that the set was manufactured by the Corona Radio and Television Co. of Chicago.

❖ Line Cord Resistor Replacement

At the conclusion of last month's column we discussed one strategy for replacing the line cord dropping resistor in the "Little Fellow." It involved rectifying the line voltage with a small diode, thereby reducing it from 120 to 85. Subtracting the 62.6 volts accounted for by the tubes, this left only 22.4 volts to account for by adding a resistor.

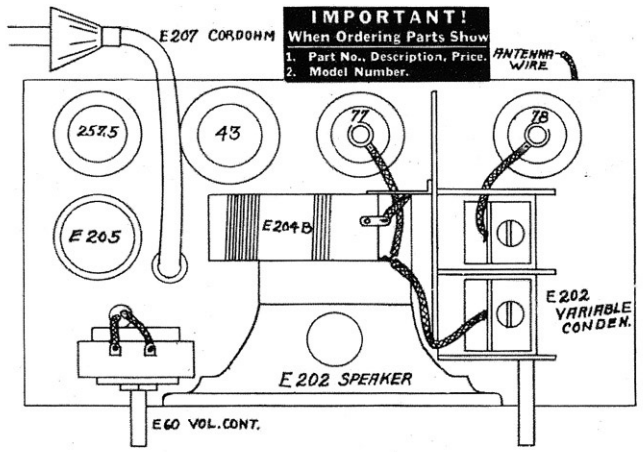
Using Ohm's law, keeping in mind that the tubes draw .3 amperes, the value of the resistor would be E/I=22.4/.3 which equals a little under 75 ohms. The power dissipated in the resistor would be I^2R=(.09)(75)=6.75 watts. That seems small enough so that the resistor can be mounted under the chassis without worrying about overheating. It's the method I decided to use for our restoration project.

We also mentioned that another way of dropping voltage is to use a series capacitor. It behaves as a resistor, but with insignificant heat dissipation, when passing a.c. The problem is that the non-polarized capacitors required are not readily available in the necessary large capacities. They are also physically large, which makes them hard to hide under a chassis.

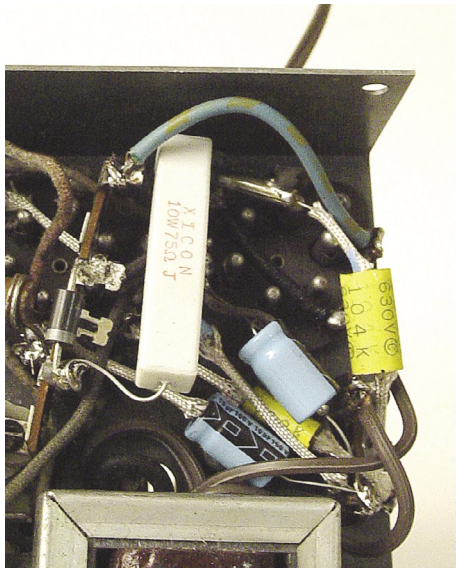
A capacitor of approximately 8 mfd is required to drop the 120-volt line to the 62.6 volts needed by the tubes on the "Little Fellow." The calculations needed to come up with this value are a little tedious but, luckily, all the work has been done for us by Paul Stenning, a very helpful gentleman from the UK. Take a peek at **www.vintage-radio.com/repair-restore-information/valve_dropper-calcs.html** (I know that's a lot of URL to copy, but it's worth it!). Here Paul goes through all of the calculations required for the various methods of replacing line cord dropping resistors.

However, you don't have to worry about the calculations if you don't want to. Just scroll all the way down to "Droper (sic) Calculations Spreadsheet (ZIP file - file size 6k)" and click on that. It will open a little Excel window which will calculate component values for a series resistor, series diode and resistor or series capacitor. Just put in your parameters and the calculations are automatic. Everything is self explanatory, but don't forget to change the supply voltage and frequency from the 240 volts and 50 cycles prevalent in the UK to our own 120 volts and 60 cycles. Thanks, Paul!

Just in case something happens to Paul's site, I made a copy of the Excel file and will be happy to e-mail it to anyone who has trouble getting it from the site.



Chassis drawing from Mike Ostrowski's Silvertone manual verifies that our chassis is indeed a model 1728A.



Added terminal strip (at left) holds diode and its series resistor. Two of the three new electrolytic caps can be seen just to the right of the lower end of the resistor.

❖ Cleaning and Recapping

This month's work session began with an examination of the parts removed last month for cleaning. The tuning capacitor received a spraying of NAPA brake and electric motor cleaner, a fluid that does an excellent job in this application. I couldn't do much with the rusty speaker except to dust it a little. But I was going to have to find a replacement for the volume control. Suspicious of it because it didn't look original and a jumper wire had been attached to the wrong terminals, I checked it with an ohmmeter. It was a 20,000-ohm unit and the schematic called for 300,000 ohms.

Before reinstalling the parts, I pondered what to do about the top of the chassis. Besides being dusty and grimy, its finish was pock-marked and pitted, with the paint eaten through in many spots. I considered a repaint, but decided against it. This set was far too timeworn to ever be the subject of a "grand prix" restoration.

Instead I brushed out the dust, went over all the pitted surfaces with fine steel wool, and then cleaned up with a damp rag. Quite a bit of the paint was still intact, and this way, at least, its original grey color remained visible.

Just by luck, one of my few junk box controls with the necessary a.c. switch turned out

to have the correct resistance and I installed it in place of the old one. Slipping the speaker back onto its original mounting, I then turned my attention to the tuning capacitor. I hadn't noticed when removing it, but as I replaced the hardware I realized that there were fiber bushings insulating the frame from ground. That had me scratching my head for awhile because the schematic (see May, 2006 column) showed it to be grounded.

After awhile, I realized that none of the grounds shown on the schematic were actually made to the chassis. Instead, each connection was made to a "ground bus" wire that ran through the set. This was an unusual safety precaution for the era (see the discussion of "International Kadette Universal TRF Receiver" in the April, 2006 issue) – avoiding the possibility of the "hot" side of the line being connected to the chassis, control shafts, etc. It must have been a last-minute design change that was never reflected in the schematic.

With the above-chassis parts reinstalled, I began to replace all of the paper and electrolytic capacitors. Prior to removing each part, I located it on schematic – primarily because I wanted to double-check its value. The print on the actual capacitors tended to be faded and obscured by dirt.

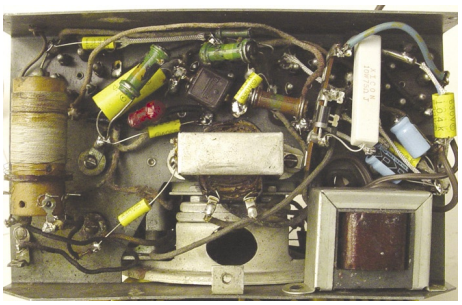
When I first got a look at the crowded conditions under the chassis, I wondered if I would have room to add the three individual capacitors that would replace the top-mounted multi-section electrolytic. I was envisioning being forced to clean out its guts so that I could mount the three new caps inside. However, I needn't have worried. The new capacitors are so much smaller than the old ones that I had plenty of space to slip everything in – including the diode-and-power resistor dropping device. The old multi-section unit was simply disconnected and left in place for an authentic appearance.

❖ A Suspicious Antenna Coil

While working on the capacitors, I noticed that the antenna coil looked suspicious. It showed signs of having been replaced, because its solder connections didn't look factory made and no part of the coil matched up with the mounting bracket provided on the chassis. The unit was simply held in place by its leads (which actually were stiff enough to do an adequate job). On top of that, one of the two wires from the primary of the coil had been left unfastened and taped up.

The antenna coil was an obvious replacement, but my concern that it might be an incorrect type proved groundless.

It wasn't unusual for the antenna coil of a radio that could be hooked up to an outside antenna to be damaged by a lightning strike. The fine wire in these coils is easily burned out – even by the voltages induced by strikes that were not direct hits. Though this set was supposed to operate from a hank of antenna wire laid under a rug or thrown out a window, the hank had been cut off a few feet from the set and the end was stripped back – no doubt to connect to an outside antenna.



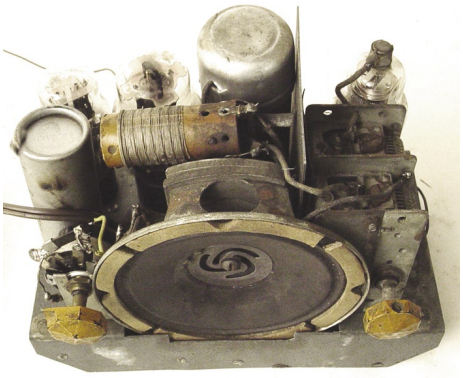
Underside of chassis after all work was completed. Looks quite a lot more roomy when compared to the original photo (see last month's column).

After verifying that the primary of this coil was not burned out, I re-connected the wire that had been left unfastened to the proper circuit point and crossed my fingers. If the "Little Fellow" failed to come back to life, I'd have to suspect that the antenna coil was either not a proper replacement or incorrectly hooked up. I also replaced the antenna wire stub with a hank of wire several feet long.

Shoehorning the new diode and power resistor under the chassis took a little bit of care. I fastened a terminal strip to hold these parts under one of the speaker mounting screws and managed to position it so that it seemed clear of any other connections in the set. Running a new two-wire line cord through the grommet provided for the original resistor line cord, I made the final hookup to the new parts and the rest of the circuit. Finally, I deployed the antenna wire and the "Little Fellow" was now ready for testing.

❖ The "Smoke Test"

Even though this set had a ground bus that avoided the issue of direct connections from the a.c. line to the chassis, I felt it would be prudent to use a line isolation transformer for my initial tests. Also, just to make sure that my calculations for the diode-and-power resistor line dropping device were correct, I decided to use a Variac (variable transformer) to power up the set gradually while keeping an eye on the tube heaters.



Top of chassis after reassembly. I told you this wouldn't be a grand prix restoration! But in spite of the rusty, grimy appearance, the set is a lot cleaner and is in good working order.

The heaters began to glow noticeably at about 60 percent of full voltage, and the glow increased to what looked like a normal red color when I reached 100 percent. But at the same time, the speaker began to emit a louder-than-normal hum not affected by the volume control setting – a sure sign that something was amiss.

My concern was short-lived, though. The hum was caused by one of the unused lugs on the new terminal strip coming into contact with one of the connections on a nearby tube socket. It was quickly silenced by moving the strip just a tiny bit. However, the set was now **too** silent! There was no sign of a signal at any position of the tuning capacitor.

That problem, too, was easily solved. I had been testing with the volume control advanced about half-way. When I turned it up all the way, the set came to life – with too-loud signals being pulled in all over the dial. Experimenting a bit, I found that the complete range of volume control, from too loud to inaudible, was occurring in about the last one-quarter of the volume control's rotation. This is a problem caused by my replacement control having an incorrect *taper*, an issue that we'll discuss next time – when restoration of the set and cabinet will be completed. See you then!

This is your equipment page. Monitoring Times pays for projects, reviews, radio theory and hardware topics. Contact Rachel Baughn, 7540 Hwy 64 West, Brasstown, NC 28902; email editor@monitoringtimes.com.

Modifying the Uniden BC796D Scanner For Discriminator Audio Output

By John Wilson W4UVV (*w4uvv@amsat.org*)

First Things First

Why modify a scanner's audio output when it already detects analog and digital CTCSS sub-audible tones when scanning analog signals in the conventional or digital modes? The reason is that this additional feature affords several monitoring advantages. First, the receiver's CTCSS search cycle is slow: When a new analog transmission is detected, analog CTCSS tones are checked beginning with the lowest tone and progressing to the highest. If no match is found, digital tones next are checked in the same sequence. Sometimes the CTCSS tone is not identified on short duration transmissions as they terminate before the correct CTCSS tone, if present, is identified.

Secondly, with a direct discriminator audio output connection to an external CTCSS tone decoder, the tone, if present, is displayed immediately.

Thirdly, this connection to a computer via a Level 2 or Level 4 dataslicer and RS232 computer comm port interface offers a monitoring advantage. It eliminates the need for a second receiver/scanner tuned to a 400 or 800 MHz data control channel in order to execute Trunktracker 3.8.3, DEMO88 and TRUNK88 MS DOS software for Motorola Type I/II and Etrunk 3.8.1 (EDACS) 400/800 MHz trunked radio systems(TRS).

WARNING!

This modification will void any BC796D warranty! Attempt this modification at your own risk! The modification is neither complicated nor expensive, but it does require the person to have a steady hand and good concentration.

Components

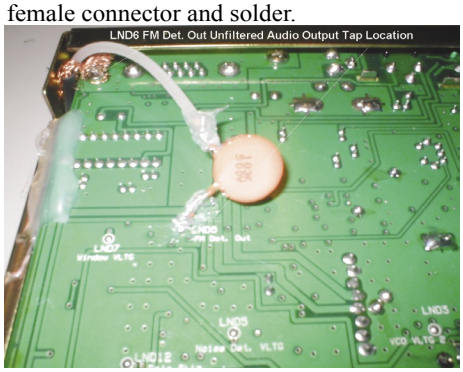
Modification recommended components: Purchased components cost is estimated at approximately $15.00.

Philips screwdriver
Shielded insulated audio/visual cable (Approximately 18 inches)
5 watt soldering iron
60/40 solder
One female RCA chassis connector. (I prefer using RCA male/female connectors but comparable male/female RF connectors may be substituted)
3/8 inch power drill with various size drill bits
7/32 inch to 1/4 inch
Pliers
Boxcutter or trimming knife
One .01 mF disc ceramic capacitor
Electrical tape
Silicone sealant dispenser
Wire cutters

Let's Do It.

The following modification steps are provided as recommendations and guidance only. There are other ways to do this modification as you may choose, but the below method has proven to work without adversely impacting the scanner's performance.

The main objective is to locate the pc board's desired solder/tap point; solder one end of a .01 mF disc ceramic capacitor there, solder the other end to the center conductor of an appropriate cut length of A/V cable; connect the A/V braid to ground; route the other end of the A/V to a rear chassis mounted RCA female connector and solder.



The target soldering pc board location is labeled "LND6 FM Det. Out." See Photo 1. Tone decoding attempts at the more obvious pc board location labeled "LND8 CTCSS Det." were unsuccessful.

STEP ACTION(S)

1 Unplug the AC/DC power supply; remove the power plug connector from the receiver; unplug the antenna connector and remove the TOP receiver cover.

2 Cut the male connector from each end of the insulated shielded A/V cable and remove approximately 1-3/4 inches of outside insulation from one end and separate the shielded ground braid from the insulated center conductor.

3 Cut excess wire from the .01 mF disc ceramic capacitor leaving two approximately 1/2 inch wire "legs".

4 WARNING! DO NOT USE A SOLDERING IRON RATED HIGHER THAN 5 WATTS. USING A HIGHER WATTAGE IRON MAY DAMAGE PC BOARD TRACES OR OTHER CONNECTIONS AND/OR POSSIBLY DAMAGE MOUNTED COMPONENTS. Heat one end of the capacitor wire "leg" and apply a very small amount of solder. CAREFULLY using only the minimum amount of solder and heat necessary to effect a good soldered connection at the "LND6 FM Det. Out" point, solder that wire "leg" to it. Remove any solder debris and place a small piece of electrical tape on the pc board beneath where the capacitor will lie close and parallel to it.

5 Viewing the receiver front to rear carefully route the other end of the A/V cable through the open area at the rear left corner.

6 At this location a Philips screw secures the left rear pc board to the chassis. Loosen it and wrap an appropriate length of shielded ground braid for a friction fit. Ensure enough length of shielded braid and center conductor cable remain to solder it non-stressed to the .01 mF disc ceramic capacitor. Tighten the screw. Remove any excess braided ground shield.

7 Remove approximately 1/4 inch insulation from the center conductor A/V cable and wrap around the remaining capacitor wire "leg." Solder the connection. Insure when both lay parallel to the pc board bottom neither touches any trace or connection. Apply a small amount of silicone sealant to each exposed wire "leg" of the .01 mF disc ceramic capacitor. See Photo 1 for what the modification looks like at this point.

8 Replace the receiver's TOP case cover; remove the receiver's BOTTOM case cover and disconnect the speaker wire connector from the pc board.

9 Viewed from the outside rear to front prepare to drill a small "pilot" hole using a 7/32 inch bit or one of similar small diameter. I chose to drill the RCA connector mount hole approximately 3/4 inch down from the top and approximately 2 inches inward from the outside rear chas-

sis. This locates the RCA female chassis connector in an open area away from an inside rear chassis metal flange and DC power connector.

10 CAREFULLY and SLOWLY drill the target pilot hole. Increase the hole size using slightly larger bits until 1/4 inch size maximum.

11 Mount the RCA female chassis connector securing it with the threaded nut and tighten using pliers. Ensure the ground solder connector flange is bent slightly outward.

12 Cut any excess A/V cable beyond the place after removing approximately 1-3/4 inches of outer insulation that allows non-stressed solder connections to the RCA female chassis connector.

13 Remove approximately 1-3/4 inches of outside insulation from the A/V cable. Separate the braided ground shield from the center conductor cable and remove approximately 1/4 inch of insulation. By trial and error measurements, configure the A/V cable to allow non-stressed solder connections of the center conductor and braided shield ground to the connector. Remove any solder debris. See Photo 2 for what the modification looks like at this point.

14 Reconnect the receiver's speaker wire connector to the pc board and replace the BOTTOM case cover. See Photo 3 of the rear chassis mounted connector.

15 Reconnect the power supply and antenna connector to the receiver. Turn on the receiver. If receiver performance is not within specification, check the capacitor/cable routing/connections. Inspect to ensure the capacitor is not shorting out. If it is, provide additional insulation around it. Replace the case cover and reconnect the power supply and antenna.

16 Calm down and stop shaking. The modification is finished.

❖ Let the Tests Begin.

Scenario 1.

BC796D and standalone CTCSS tone decoder. Using a standalone analog/digital tone decoder, connect the male RCA cable connector to the BC796D RCA female unfiltered audio connector. On the BC796D select any frequency search or scan range of low or high VHF or UHF. Watch the tone decoder display. The analog or digital CTCSS tone for analog radio transmissions using CTCSS display, if present, displays within a second. See Photo 4.

Scenario 2.

BC796D/Dataslicer RS232/Trunktracker 3.8.3. interfaces. Trunktracker 3.8.3 is a freeware MS DOS software program used in conjunction with unfiltered audio input to a Level 2 or 4 dataslicer. The dataslicer output inputs to the computer via an RS232 comm port interface.

Trunktracker 3.8.3 is designed to operate in a boot up MS DOS mode. However, on some computer models it will work in the MS DOS shell mode from Windows. Don't throw away those older computers as they have value for this type of application.

Trunktracker 3.8.3 allows the radio monitor to view in real time various talkgroups of 400 and 800 MHz Motorola Type I and II trunked radio transmissions that also display on the BC796D. By radio monitor keyboard entries, talkgroups can be color coded to provide more meaningful informational talkgroup displays. For example, police talk groups can be color coded blue and blink for a few seconds when initially active; fire talk groups may be coded red; rescue talk groups magenta, utilities talk groups yellow, etc.

Photo 5 shows the BC796D interfaced with a dataslicer Level 2 and Trunktracker 3.8.3 on a local area 800 MHz Motorola Type II TRS. The BC796D unfiltered audio output removes the requirement of having to use another modified receiver/scanner tuned to the desired TRS control channel frequency to provide the same unfiltered audio input to a Level 2 dataslicer and Trunktracker 3.8.3.

One negative performance tradeoff was noticed as a result of the BC796D scanning in the trunked mode. Occasionally the control channel audio output was momentarily interrupted, which resulted in an occasional missed talkgroup monitor display. No talkgroup display was missed on the BC796D. An occasional missed talkgroup condition using Trunktracker 3.8.3 also can occur with a dedicated standalone receiver/scanner tuned to the control channel due to heavy TRS communication traffic volume.

Etrunk 3.8.1 for a local area EDACS TRS was tested and performed similar to Trunktracker 3.8.3. Other than as noted, both software packages and the BC796D performed as designed.

❖ Closing Comments

I have not yet installed DEMO88 and TRUNK88 software on my test computer and they were not tested. As they are basically enhanced versions of Trunktracker 3.8.3, they should perform similar to all the discussed software packages which require unfiltered audio input to a dataslicer and an RS232 computer comm port interface.

PARTS/COMPONENT SOURCES:

.01 mF Ceramic disc capacitor
Radio Shack Catalog Number 272-131
www.radioshack.com
Shield Phono Jacks Panel Mount
Radio Shack Catalog Number 272-346
www.radioshack.com
Audio Visual Insulated Cable
Radio Shack Catalog Number 15-1591
www.radioshack.com

RELATED LINKS:

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(trunked radio information)
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(dataslicer diagnostic software)
www.trunkedradio.net/digital/download.htm
(Trunktracker 3.83 and Etrunk 3.8.1 software)
www.dataslicers.com
(Level 2 dataslicer purchase)
www.huttononline.com/HuttonOnline/radioaccess/aspx.?cat=11
(Connect Systems standalone analog/digital CTCSS Decoder CD-2 purchase)

MT REVIEW

ICOM IC-PCR1500 & R1500

By John F. Catalano

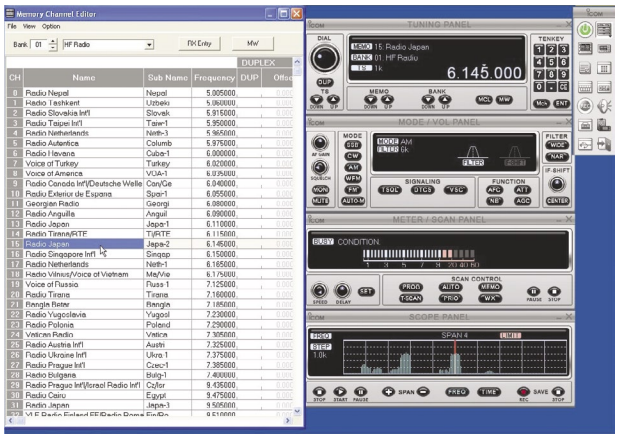


Figure 2 - 1500 shown in the component format in the center. The "Tool" Bar is at right and the memory channel editor (log) at left

Anyone who has read my *Computers & Radio* column over the past years knows I rate the ICOM IC-PCR1000 right up there at the top of wide spectrum, computer controlled receivers. It was one of the first with full capabilities and is easy to use. I still think it's great. So, when the rumor mill began churning concerning a replacement for the venerable 1000, I was all ears. But oddly, at the time of this writing, the 1500 is still not even mentioned on the ICOM America website.

The 1500 family is based around a computer-controlled receiver "black brick" similar to the PCR1000, but larger. Other than a power switch, all other functions on the IC-PCR1500 are controlled via a PC. It comes with its own suite of ICOM software, which we will put through its paces. Its list price is $695, but is discounted by many dealers.

On the back of this "brick" is a jack labeled "Controller." ICOM has developed a separate "Controller" which plugs into this jack, thereby removing the need for a computer. The Controller, which is visible in the foreground of Figure 1, is roughly the same size as the removable front panel on the ICOM IC-208H 2 m/440 MHz mobile. If the unit is purchased with the Controller, its designation changes to IC-R1500 to reflect the fact that it is a standalone receiver. List price is $845 with discounts common.

Well, thanks to the people at Grove, which has 1500s in stock, we have had a 1500 for our use for the past few weeks. So here goes with our first impressions.

❖ Operational Specs

The receiver circuit is a triple-conversion superheterodyne with intermediate frequencies (IF) at 266.7, 10.7 and 0.45 MHz. The most dramatic specification is its frequency range. The 1500 almost covers the fabled "DC to Light," going from 0.01 to a 3299.999999 MHz (0.495 to 3000 MHz guaranteed). The US consumer version omits the cellular phone frequencies in the 800 MHz range. It tunes this wide range in steps from 1 Hz to 10 MHz selectable by the user. In addition, the user can define a customized tuning step. Modes of operation include FM, AM, WFM, USB, LSB and CW.

Figure 1 - The ICOM IC-PCR1500 and the controller that turns it into the IC-R1500

Sensitivities are quite respectable in the 1.8 to 1300 MHz frequency range, equal to or better than SSB/CW at 0.5 uV and AM at 2.5 uV. FM sensitivity is spec from 28 to 13000 MHz at equal to or better than 0.63 uV and FMW at 1.8uv. In typical ICOM fashion, to "tame" the strong AM (MW) commercial radio station signals, sensitivities are purposely reduced below 1.8 MHz by a factor of 10.

❖ Physical Specs

Although compact at 5-3/4 (W) X 1-5/8 (H) X 8-1/8 (D), the 1500 is thicker and larger than the PCR1000. However, the 1500's internal speaker has been increased to 2.5 inches, which provides "listenable" quality sound. A rather large 12-volt DC, wall-mounted power pack supplies juice to the 1500.

The back panel of the 1500 has six connectors and a grounding screw. DC power and external speaker connections account for two. The antenna is connected via a BNC. The aforementioned Controller connects via a telephone style RJ jack. A "Packet" jack can be used, with a TNC (terminal node controller), to decode 9600bps packet ham signals. This is not very different from the back panel of a PCR1000.

A major difference is the computer interface. Gone is the 9 pin serial port jack, replaced by a USB jack. In theory, this is a higher speed connection than the serial port. In addition, the 1500 can use the USB port to send demodulated audio to the computer for storage or playing through the soundcard/speakers. However, as ICOM warns in the manual, this slows down the CPU and should only be used with fast PCs.

❖ PC Requirements

Clearly, a PC with a USB port is required. The minimum PC configuration suggested by ICOM is a Pentium III, 450 MHz, 128 MB RAM, 50MB hard disk space, 1024 x 768 high color screen capability and CD ROM drive. A Pentium 4 with 256 MB of RAM is recommended.

The receiver control and memory (logging) program come on a CD and work with Windows XP/2000/ME/98SE operating systems.

Against ICOM advice, I first tried to use a Pentium I 233 PC running Win98SE. This is the PC I first ran the PCR1000 on many, many years ago. The installation proved to be surprisingly tedious, requiring three different drivers to be loaded from the ICOM CD. Not following ICOM's installation instruction *exactly* caused me unnecessary grief. However, after I corrected my mistakes, the 1500 did run on the Pentium I, although the screen update was slow, very sloooow.

Going to a faster Pentium III, 1 GHz running Windows XP, installation is still not plug and play. The XP system still required the same three driver installations, with just as much care required. My suggestion? Be real careful and follow the ICOM driver installation instructions exactly. Once properly installed, a shortcut is placed on the Desktop.

❖ Tooling Around

Starting the program via the Desktop icon brings up the Tool Bar.

Here, in Figure 2, we are displaying the critically important Tool Bar, shown as a long vertical box at the upper right side of Figure 2 along side the Component receiver screen.

The Tool Bar is one method of controlling all major functions, including starting the program, selecting the receiver type screen, saving files, memory management, USB management, digital audio recorder, cloning memory files, DTMF unit, setting options, exiting the program and much more.

In what we have now come to know as ICOM-style, the software allows you to control the receiver with three different receiver display types: Simple, Multi-Function and Components. This is very similar to the PCR1000 ICOM Software Rev 2.2.

The Simple radio screen looks like a desktop scanner, with its few, but capable, controls. The Multi-Function Receiver screen is reminiscent of a high-end communications receiver with the front panel crammed with buttons and knobs. See Figure 3. The Component screen displays different functions on different panels, four main panels, in all. We'll concentrate on this screen, seen in Figure 2, which contains all the functions available to the 1500 user.

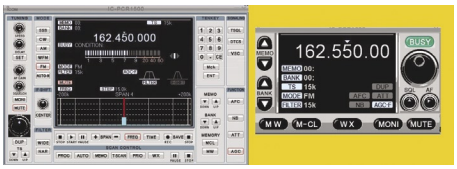


Figure 3 – The other faces of the 1500 - multi function communications receiver (left) and simple radio (right)

The Component screen, also shown in Figure 2, looks like a bench or a rack full of separate units. At the top is the Tuning Panel, which offers a number of tuning methods, which utilize PC keyboard/mouse-screen interactions. Let's look at a few.

The "ten key" pad on the right side of the Tuning Panel can be used to input frequency directly, followed by the "Ent" button. Another method employs the dial, shown on the left side. Placing the cursor on the dial, the frequency can be tuned up (right mouse button) and down (left). This approach is used by all "knob" controls. The little arrowhead above a digit indicates which digit the dial will control. The TS switches below the dial determine the arrowhead's position.

All graphical mouse click commands can also be performed via keystrokes. One very nice feature that ICOM has included in the software is user customization of keyboard commands. This is simply and easily performed via a dropdown table accessed from the Tool Bar's "Setting" icon. This is a great control method which should be incorporated into all radio control software. You now have a general feeling for the control methods of the 1500 software.

❖ Kicking the Tires

Let's point out some of the unique/interesting features and functions of the 1500. The "Signaling" section of this panel allows the user to choose different squelch methods including tone and voice. For example, right clicking on TSQL button brings up a menu of tone frequencies that the user can select. The 1500 can decode and utilize pocket beep, DTCS and tones to open its squelch. Additionally, it can determine and display an unknown access tone frequency or DTCS code that it receives.

The IF shift control, seen on the "Mode/Vol" Panel, has a re-centering feature that is very handy. No matter where you have set the IF bandpass, one click and it's back in the middle of one of the six user-set filters. Not a new feature, but very useful.

Meter/Scan Panel

The next panel down controls some important scanning features of the program. The buttons in the Scan Control area enable tone scanning (which stops a scan when a selected tone is present), priority channel scanning, and weather tone alert monitoring. Each one worked perfectly.

Band Scope

The last panel is deceptively simple in its appearance, but it is one of my favorite features. This panel is incredibly versatile and performs many different functions. In one mode, signals on either side of the tuned frequency are displayed. Clicking on a "peak" will retune the 1500 to that frequency. This is an indispensable tool when searching for new frequencies. The spectrum can be saved as a file for later viewing and analysis. In another mode, the band scope displays the signal strength of the tuned signal, over a given time period. This is very useful for propagation and signal analysis.

However, as in the PCR1000, while the Band scope is operating in the SSB or CW mode, the audio is shut off with no possibility of listening to the signal.

The 1500 Band scope software includes a "Wide Band Scope" feature that allows 1, 2 and 5 MHz wide scans. It means you can determine the signal activity in an entire ham or shortwave band with one scan, just like a spectrum analyzer.

Other Band Scope capabilities include band scanning in the WFM mode and 1/2 sweep, doubling the sweep resolution – features found only on $10,000 communications equipment not too long ago!

Multichannel Scanning

The Multi Channel Monitor (MCM) provides a quick graphical method of "watching" up to 25 active channels. See Figure 4. Each box represents a frequency entered via a table accessed from the Tool Bar.

Once MCM scanning begins, the channel number, a user-defined name, frequency, and S-meter reading are displayed almost simultaneously for all channels. The color of a square also indicates activity and signal strength. Black shows no activity and red indicates a signal level greater than S9. In order to hear a channel, scanning must be stopped by clicking on the channel-box to be monitored. In Figure 4 we can see from their S-meters that channels 2, 9 and 11 are active.

Figure 4 – Monitoring 25 channels – the multi-channel monitor screen

More on Memory

The 1500 can utilize its memory in many useful ways. Basically, each PCR1500 file can have 2600 user defined memory channels. These are arranged as 100 channels in 26 Banks. Look back at the left side of Figure 2. Here you can see the Memory Channel Editor table display filled with entries. We are looking at Bank 01, labeled "HF Radio." Due to display limitations, only the first six of thirteen columns are visible. All thirteen parameters are user-selectable.

I consider this a station log of sorts, since clicking on a line causes the 1500 to automatically tune to that channel's thirteen parameters (yet another tuning method). In Figure 2 we have tuned the 1500 to Radio Japan on 6.145 MHz by clicking on Channel 15 in Bank 01.

The Tuning Panel allows control of the memory banks via the buttons located below the frequency display. Alternatively, the Tool Bar Memory Edit icon can be used to display and modify the memory channels in table form. Another method of modifying the memory is via the "Auto-Write" feature. When the 1500 is scanning and stops on a frequency, it can automatically be written to a memory bank and channel.

More on Scanning

There are so many potential combinations of scan modes that we cannot cover them all here in detail. Briefly, they include programmed, select memory, mode select memory, mode scan, memory skip and auto memory write. I tried them all and they work as advertised.

The different squelch types really are helpful for optimizing different scanning environments. We found that the 1500 squelch operated very reliably and was sensitive enough to allow for even very weak signals to break it.

How fast does the 1500 really scan? The spec says it should run at 60 channels per second. On the Pentium III 1GHz PC we measured 27 channels per second when scanning memory frequencies. In the Multi Channel Monitor mode it was 14 channels per second. Perhaps the discrepancies are due to the older PIII computer.

❖ Personal Impressions

We have just touched on the capabilities of the 1500. In fact, we have missed important features such as the UT-106 DSP unit, an added accessory which adds noise reduction and an auto notch filter. But we're almost out of space.

The Controller works very well, is easy to use, and unchains the 1500 from a PC. Although fun to use, I'm not convinced that the Controller is worth the extra cost. Remember that a very inexpensive Palm Pilot can control the PCR1000! In any case, connecting the 1500 to a PC allows it to perform to its full potential.

According to the sensitivity specs, in the 1300 to 2300 MHz range sensitivity falls off by a factor of 8 to 10. Then from 2300 to 3000 sensitivity falls by another factor of 3, bringing the total reduction in sensitivity close to a factor of thirty (30) times. (This dramatic drop-off in sensitivity could be the result of shortcuts in construction techniques, but one would have to look inside to know.) However, the more pertinent question may be: unless you're on the space shuttle, what is there to hear above 2300 MHz?!

I was really excited about the Multi Channel Monitor feature. But after using it for a while, I decided it really wasn't useful. Since a "hit" counter is not included as a box-displayed parameter, it's difficult to keep track of the active channels without constantly looking at the display. And if you don't manually click on a single channel "box," you don't hear *anything*. Not very multi channel!

Overall, the PCR1500 is a very capable receiver – wide ranging, sensitive, with lots of functions and easy to operate. Once *all* the drivers were properly installed, the software worked smoothly and without any problems, no matter how I abused it.

I really like the IC-PCR1500. In fact, it reminds me a lot of my old favorite the IC-PCR1000! So, next time we'll do an A-B comparison of the PCR1500 and the PCR1000 on the same antenna and computer. Stay tuned!

The Icom 1500 series is available from Grove Enterprises (1-800-438-8155; order@grove-ent.com) – $579.95 for the PCR-1500 and $699.95 for the R-1500 (base/mobile receiver can be used without computer).

The Uniden BCD996T
A Marvel of 21st Scanning Technology

By Larry Van Horn, N5FPW
Assistant Editor *Monitoring Times*

The new Uniden BCD996T base/mobile is truly a marvel of modern scanning technology. Released hot on the heels of the popular Uniden BCD396T handheld scanner, many of the innovative features included in that scanner can be found in this new Uniden release. Some of the features have been expanded and updated, and a host of new features have been added to this new base/mobile unit.

❖ Case, Controls and Antenna

The BCD996T is the first new tool up of a base/mobile unit by Uniden in over four years. Not only has the case changed compared to earlier models, but changes have been made in the RF sections as well. However, the lineage of this unit's firmware comes from the BCD396T. The 996 case is much smaller than its 796 predecessor, measuring 7.2 (W) x 5.9 (D) x 2.2 (H) inches and weighs in at 3.46 lbs without mounting bracket.

There is an orange or green backlight system (user selectable) for the 1-1/8 by 2-1/8-inch (64 x 128 full dot matrix) liquid crystal display and the keyboard. You can turn off backlighting or set three levels for each color without going into the scanner menu system by pressing the volume control on the front of the unit.

Controls/Switches on the 996 include a knurled rotary encoder knob (with push switch for function operations), volume control with power on/off switch (with push switch for back light control), and squelch control (with push switch for Close Call™ mode).

❖ Checking under the hood

Looking inside the radio, we found a world of scanning capability. Here are some features that will be familiar to BC246T/BCD396T owners:

- Close Call RF capture technology can set the scanner so it detects and provides information about nearby radio transmissions. In a head to head test between the 246, 396 and the 996, the 996 was superior.
- Dynamically allocated channel memory was first introduced in the BC246T. See the December 2004 issue or go to **www.monitoringtimes.com/htm/mtuniden246t.pdf** for a detailed description of how this works. This type of scanner memory can be organized so that the scanner operation more closely matches how radio systems actually work, making it easier to program and use the scanner. Through the menu system you can determine how much scanner memory is being used and how much is left. Like its 396 sibling, the 996 has a whopping 6,000 memory locations for programming frequencies, talkgroups, and alpha tags.
- There are over 500 agencies (133 systems) preprogrammed in the scanner covering police, fire, and ambulance operations in 30 metro areas and 12 states in the U.S., plus some of the more popular digital trunk systems, and a selection of nationwide allocations.
- One hundred Quick keys let you quickly select systems and groups by using the keypad. This makes it easy to listen to or quickly lock out systems or groups. There are 13 Service search frequency ranges preprogrammed for public safety, news, amateur radio, marine, railroad, military and civilian air, CB radio, FRS/GMRS, racing, TV broadcast, FM broadcast, and special searches.
- Personal Computer (PC) Control allows you to transfer programming data to and from the 996 and a PC, or actually control the scanner's operation using your computer. Uniden will make available for download their UASD PC control/programming software and a free registration key via their company website at **www.uniden.com.**
- Cloning over-the-air lets you clone all programmed data, the contents of the scanner's memory, menu settings, and other parameters over a user-selectable frequency from a PC to one or more 996 scanners. Cloning is also possible from one 996 to another using a serial computer cable, null modem adapter and gender changer (not included), and the computer interface cable included with each unit.
- Adaptive Digital Threshold automatically sets the digital decode threshold for APCO digital systems. You can also manually adjust or reset to default digital reception levels. Analog and digital audio automatic gain control (AGC) helps automatically balance the volume level between different radio systems both digital and analog.
- Fire Tone-out Standby lets you set the scanner to sound an alert if a two-tone sequential page commonly used on fire dispatch frequencies is transmitted. You can set up to 10 settings (transmit frequency, tone frequencies, tone duration and tone gap), then select one of the programmed positions for standby monitoring and alerting.
- Broadcast Screen sets the scanner so it ignores Close Call or search hits on FM/TV broadcast frequencies, including known pager frequencies. The custom screen lets you input up to 10 frequency ranges that the scanner will ignore during Close Call or search operation.

Some of the other features found in the BCD996T include: Scan/Search delay, a 20 dB attenuator, repeater reverse, channel alert, search with scan operation, enhanced custom alerts, better automatic channel step selection (frequency steps of 5, 6.25, 7.5, 8.33, 10, 12.5,15, 20, 25, 50 or 100 kHz for manual mode and search modes), text tagging, data skip, duplicate frequency entry alert, memory backup, frequency and talkgroup auto store, and priority scan/priority channel scan.

Like many of the recently released Uniden scanner models, the 996 can perform a NOAA weather band search, SAME weather alert, and weather priority scan. There is also a nearly instant CTCSS/DCS tone search capability that can identify up to 50 CTCSS tones and 104 DCS codes in the scan, search and Close Call modes.

There are a lot of other BC996T features that BCD396T owners will recognize, far too many to include in this review. You can get more information on all of the BCD996T features by viewing a copy of the owner's manual on the Grove Enterprises website at: **www.grove-ent.com/BCD996Tman.pdf**

❖ Trunk Tracking Capability

The BCD996T is a Trunk Tracker IV™

Photo courtesy of www.rigpix.com

MT Rating: 4-3/4 Stars

model scanner. This lets you follow unencrypted conversations on analog Motorola, Motorola mixed mode (analog and digital/3600 baud) systems, Motorola Astro 25 (APCO 25 9600 baud) digital systems, EDACS (wide and narrow), EDACS SCAT, and LTR trunked radio systems.

Trunk systems in VHF, UHF, the new 700 MHz public safety band, 800 and 900 MHz bands can be tracked. This includes some of the trunk systems now being installed by the Department of Defense in the new 380-399.9 MHz LMR subband. This makes the 996 only the second scanner capable of following trunk systems in all the bands where trunk systems are currently operational. The scanner can also scan both conventional and trunked systems at the same time.

The BCD996T also follows Motorola control channel trunking. If the scanner is set in this mode, the user can set it up so that it tracks a Motorola trunk system using only control channel data. You do not have to program all of the system's voice channel frequencies into memory in this mode, as long as all possible control channels have been programmed.

❖ What's New

There are several new features and innovations in the 996 that are unique to this radio. They include:

- The new multi-site trunking feature lets you share system channels across multiple trunk system sites to more efficiently use the scanner's memory. **This upgrade alone, in the author's opinion, elevates this scanner above any other trunk scanner in the marketplace.** If you have a statewide system, and you want to program in multiple sites/frequencies for that system, you only have to program in one set of talkgroups using the multi-site feature.
  Another example of how you could use multi-site trunking is in conjunction with a GPS unit in an urban public safety environment. You could program one transmit site (say, the west side of the city) with talkgroups associated only with that portion of the city. As you travel around the city, the GPS would hand your BCD996T off to the appropriate programmed site and talkgroups as you travel. This would let you monitor only those talkgroups that are pertinent to the area you are transiting and cut out talkgroups for other areas of the city.
- Close Call do-not-disturb is a new feature that, when set, lets the unit make periodic Close Call checks whenever the scanner is not receiving audio in another mode. This eliminates annoying breaks in conversation while still allowing for Close Call functionality. Another new innovation is Close Call temporary store that temporarily saves the last 10 Close Call hits and includes them when scanning.
- "Soft" search keys let you quickly search specified ranges and quick search lets you search from the currently-tuned frequency if you are searching a conventional system.
- A new frequency lockout function lets you lock out up to 500 frequencies (250 permanently locked out and/or 250 temporarily). The scanner skips locked out frequencies while using Close Call, scanning memories or while searching a frequency range. Temporary lockout is cleared when you turn power off, then back on, so you don't have to remember to unlock those channels later.
- Another new feature is startup configuration, which lets you easily manage multiple configurations you program into your scanner.
- The single-handed function control operation lets you tap the function/scroll control to enable the function mode. It reverts to normal mode in about three seconds from your last press if no other action occurs. This is a neat feature when you are mobile.
- A record out jack, when used with the appropriate user supplied cable and audio recording device with signal control, lets you record live audio of designated channels.
- A new vehicle power connector (orange wire) lets you connect the BCD996T to your vehicle's dimmer circuit to also dim the scanner's display with the vehicle's dimmer control.
- Another innovative feature in the 996 is the upside down display. You can flip the display upside down if you need to mount the unit upside down in your mobile for better audio quality.
- Dual display mode: Mode 1 (default) displays extended channel information under the channel name. Mode 2 (selectable by front panel control) indicates frequencies under the channel name or the talkgroup ID number for trunk systems.
- Finally, there are the new GPS functions. This is location based scanning that can automatically enable and disable systems based on the location information (longitude, latitude, and range) that you provide if you connect a GPS unit to the scanner.
  Some non-radio GPS-based features let the scanner alert you to dangerous intersections, speed alerts, and points of interest (POI) that you program into the scanner. The GPS display mode lets you display extended GPS information such as distance to a POI, direction to a POI, time to a POI, speed, position, and more.

MT RATING (0-10 SCALE)

Audio Quality	9
Audio Levels	10
Backlight/Display	10
Ease of Use	7
Feature Set	10
Keyboard/Control Layout	9
Overall Construction	10
Overall Reception	10
Owners Manual	9
Sensitivity	9
Selectivity	9
Spectrum Usability	9

❖ What's in the box?

In addition to the BCD996T scanner, accessories in the box include an AC adapter, cigarette lighter adapter power cord, three wire DC power cord, ISO mounting bracket and hardware, and a DIN-E sleeve and removal keys for vehicle installation, a push-on type (BNC) telescopic antenna, remote PC or scanner cable (scanner plug to front of PC connector), owners manual, and other printed material.

The manual is well written and should be studied to get the most out of the BCD996T and understand all of its operations.

❖ Overall Rating

This is the first base/mobile of its kind from Uniden. The author worked with this radio for over five months and tested it on over 115 radio systems here in the southern United States. This included single/multi-site Motorola Analog/Digital P16/P25, EDACS Analog/Digital, and LTR trunk systems in the VHF/VHF Gov/UHF/UHF Gov/700/800 MHz bands, as well as a variety of conventional analog and P25 frequencies, including civilian and mil-air band frequencies. The radio handled all the monitoring chores well and was a pleasure to use in the mobile environment.

I was particularly impressed with the BCD996T performance when I conducted a side by side test with my Uniden BC796D. In most cases the BCD996T was the better performer in sensitivity, and especially so in selectivity.

Those of you who have read this column in the past know that I maintain no scanner is perfect. Almost my only complaint with the 996 is the steep learning curve. Honestly, given this feature-rich scanner and the systems it can monitor, I do not know how Uniden could simplify this learning curve or the overall complexity of the scanner's operation. So let me offer three pieces of advice to those who purchase this radio: read the manual several times, use the free UASD software to program the radio, and read the manual again.

A strange quirk I noted is the radio default to 5 kHz spacing in the 150.8-162.0 MHz public safety band. The majority of this band now uses 7.5 kHz spacing. Other than that, Uniden has come a long way in getting their search steps in line with current spectrum practices.

Finally, while the GPS capability is a neat feature, it is very labor and research intensive to get it up and operating. I am sure that with time, like other aspects of the scanner hobby, information will be shared through the internet to aid hobbyists in programming location information for a variety of radio systems nationwide. But that will be at some point down the road and probably only a few will fully utilize the GPS features in

continued on page 73

Table One: BCD996T Frequency Coverage

Frequency Range (MHz)	Default Modulation	Default Step (kHz)
25.0000-27.9950	AM	5.0
28.0000-29.6800	NFM	20.0
29.7000-49.9900	NFM	10.0
50.0000-53.9800	NFM	20.0
54.0000-71.9500	WFM	50.0
72.0000-75.9950	FM	5.0
76.0000-87.9500	WFM	50.0
88.0000-107.9000	FMB	100.0
108.0000-136.9750	AM	25.0
137.0000-143.9875	NFM	12.5
144.0000-147.9950	NFM	5.0
148.0000-150.7875	NFM	12.5
150.8000-161.9950	NFM	5.0
162.0000-173.9875	NFM	12.5
174.0000-215.9500	WFM	50.0
216.0000-224.9800	NFM	20.0
225.0000-379.9750	AM	25.0
380.0000-399.9875	NFM	12.5
400.0000-512.0000	NFM	12.5
764.0000-775.9875	NFM	12.5
794.0000-805.9875	NFM	12.5
806.0000-823.9875	NFM	12.5
849.0125-868.9875	NFM	12.5
894.0125-956.0000	NFM	12.5
1240.000-1300.000	NFM	25.0

Note: The scanner's frequency coverage is not continuous and does not include the cellular telephone, most of the UHF TV bands, or the 956-1240 MHz frequency range.

John Catalano, PhD
johncatalano@monitoringtimes.com

The ICOM_OKA Free Controller

I use the Internet in the same manner that most people use a library or magazines. In my free moments, or when my brain is on auto-pilot watching TV, I'm searching the Internet for radio programs. Most times the search results in programs that we have already shared in this column. But sometimes, just sometimes, I discover a radio application that I've not seen before. These occurrences certainly add excitement to the formulaic TV programming.

In some cases I'm surprised that the newly "discovered" program has been around for a few years. How did I miss it? Written in 2002, ICOM_OKA fits into all these categories. To be honest, I'm not quite sure where I discovered ICOM_OKA. I know it was not from its Honey Soft website **www.honeysw.com**. In any case, I'm glad I found it.

If you are a ham using an ICOM transceiver or a monitor with an ICOM receiver, you will be happy with ICOM_OKA. This ***free*** program provides rig control and logging functions for most ICOM radios. Let's give it a try.

❖ Getting Started

Originally designed for the ICOM IC-706 transceiver, the program works with most late model receivers and transceivers, which use an ICOM CT-17 interface. We are going to give it a try with an older VHF/UHF receiver, the ICOM R7000, and a newer ham transceiver, the IC-703.

ICOM_OKA downloads and installs quickly and easily. You can download the 1.3 MEG files from the above address without payment or registration. When you run the downloaded file "setup_oka.exe," it guides you through the very quick setup procedure.

The result is a newly created folder with all required files and a shortcut icon placed on your desktop. One of the files in the folder is a very comprehensive manual in MS Word format. Any question you may have on setup and operation is answered here. It can easily be accessed via the Windows' "Start" menu and, from there, to the ICOM_OKA program submenu.

❖ Set Up Carefully

Once installed, clicking on the desktop icon will display a radio front panel, which is the main (in fact, only) control screen. See Figure 1. Before you do anything, I strongly recommend that you set the serial port and radio parameters. Why? I'll tell you in a minute.

The serial port and radio parameters are set via the dropdown "Options" menu seen at the top left of Figure 1. Under this menu are three sub menus. First choose the serial port where the CT-17 is connected. Make sure that no other application is using the port.

The next submenu, Set Comm Ports, is where the speed of the serial port and the data format is set. Check your radio's manual for this information or copy it from any other program you use to control the radio.

Finally, we get to the Properties submenu, where we will set the address of the radio and the controller. Each ICOM radio has a unique address that is set to a default value at the factory. Check your manual or the Internet for the correct value. For the radios I used, the R7000 address is 08 and the IC-703 is 68. I repeated the values for the controller address.

Make ***doubly*** sure that you set these correctly. Even the manual stresses the critical importance of a correct setting. Here is where I ran into problems of my own making which caused me 24 hours of PC frustration which I'll tell you about later. Just follow the manual's directions.

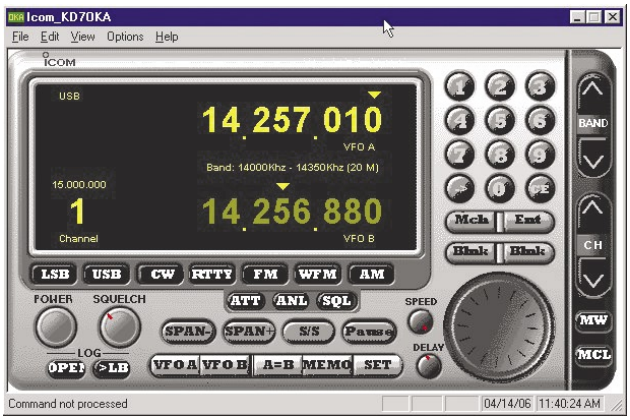


Figure 1 ICOM_OKA's one and only control screen!

❖ There It Is!

OKA's display is fashioned to look similar to the IC-703/706 line of transceivers, since the author's first goal was to control a 706. However, it also works well with the radios I tried. First up was the IC-703. This ham transceiver has a general coverage receiver and is contained in a tiny package about the size of a CB radio. Spinning the tuning knob on the IC-703 and seeing the display follow it was my first indication that we were successful.

I personally enjoy control programs that have two way communications and allow the radio to control the PC as well as the other way around. OKA does this very well.

❖ Display Layout

Looking at Figure 1, the two VFO frequency displays dominate the screen. The function buttons are arranged around the right and bottom of these displays. From the frequencies logged you can see that we have been tuning the 20-meter ham band. The button labels are pretty self-explanatory.

The mode buttons are immediately below the VFOs. Some buttons are not operational for any radio. These are the two "Blnk" buttons,"Volume", "Squelch", "Set", "Memo", "Speed" and "Dly."

❖ Tuning - Your Choice

Eight different tuning methods are possible in OKA. These fall into four operating categories: graphical, PC keyboard, direct radio, and logbook. The manual has detailed instructions for each. Starting with the graphical methods, I didn't find using the large knob at the lower right of Figure 1 particularly easy to use, except for small frequency changes. I used the mouse and the screen's keypad at the top right to grossly tune the radio. Once in range, the large knob was useful for zeroing in on the signal.

Another tuning approach is to use the left/right arrow keys on the PC's keyboard to position the inverted "V" above a digit. Then the up/down arrows on the PC's keyboard are used to tune or scan. This is a very quick and intuitive tuning method that I preferred to most others.

❖ Scanning

The OKA user can easily scan between two frequencies using the "Span -" and "Span +" button seen in the lower section of Figure 1. Enter the lower frequency using any method, then click on the "Span -" button. Repeat the procedure for the upper frequency using the "Span +" button. Then press the "S/S" to start the radio scanning and the Pause button.

Scanning worked great with the newer IC-703. However, it didn't work with the older R7000. This is due to the memory arrangement and control functions, which differ between the newer and older ICOM radios. However, using

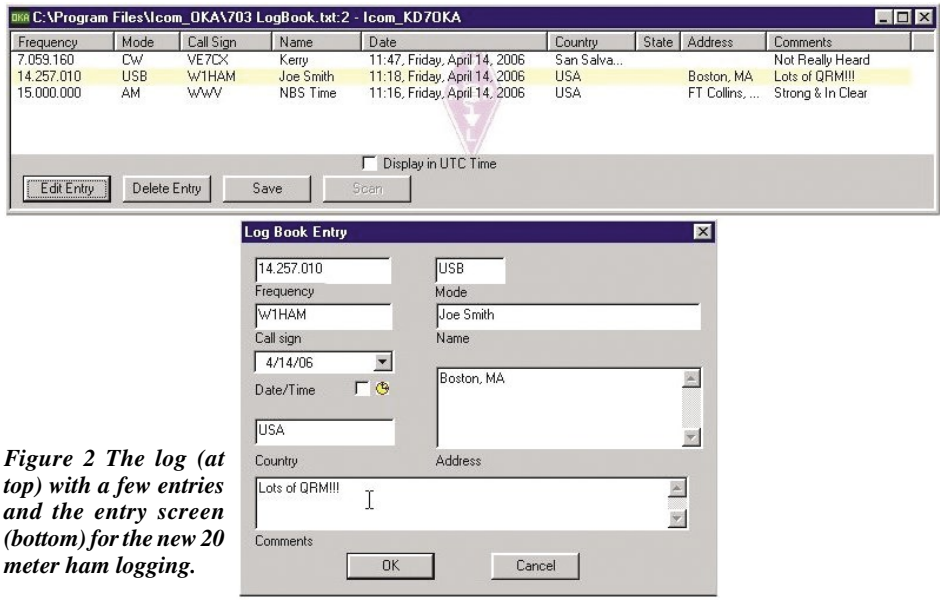


Figure 2 The log (at top) with a few entries and the entry screen (bottom) for the new 20 meter ham logging.

the logging function, the R7000 can perform a form of scanning.

❖ Logging

Other tuning methods include the use of stored memory channels and band buttons. The logging part of OKA provides more tuning and scanning methods in addition to log functions. The log is accessed using the buttons at the bottom left of the main screen, Figure 1.

Once you have tuned to a frequency that you want to log, click on the ">LB" key at the bottom left of Figure 1. This will enter the mode and frequency into the log and display the entire log, as seen in the log at the top of Figure 2. You can see from the log that we have previously stored two other entries.

Highlighting our 20-meter entry and clicking the "Edit Entry" key brings up the "Log Book Entry" screen, also seen in Figure 2. This screen allows the user to add details to the log entry. Closing the log or the main program saves the log.

❖ Log Tuning & Scanning

When the log is displayed, the radio can be tuned by simply left clicking on a log entry. Scanning a group of log entries is very easy. With the PC's "Ctrl" key depressed, left click on each of the entries that you want to scan. Then click the "Scan" button on the log screen. This scanning method works with the R7000; however, there is no way of controlling the R7000's squelch. Therefore the scan will not stop automatically. In Figure 2 the Scan button is not "lit" since we have not as yet selected any entries for scanning.

❖ Pushing TOO Hard

Remember that we discussed the critical nature of the serial port parameters? Here is the story. Never satisfied, and trying to push the envelope, I attempted to control a PCR-1000 with ICOM_OKA. The difference between the 1000 and other radios is the serial interface. The 1000 uses a direct serial connection to the PC. The other radios connect via the CT-17 level converter and then to the PC's serial port.

After trying a few port addresses, I decided to use "00," thinking that it might default to the serial port directly. Bad move. It was late at night and I ignored the manual: I thought it shouldn't cause any major problem. All I would just have to do is to reset to the correct addresses. Right? WRONG! The program locked up.

So, I restarted the program. It began to start normally and then immediately crashed with an error message. Then began hours of deleting and re-installing, registry fixing, virus checks, hard drive cleaning and just about everything I could imagine to cure the problem. I even download the program again and installed yet again. It crashed exactly in the same manner each and every time!

After a night of little sleep I ran another receiver control program to see if it would work. It worked fine and I shut it down. But when I started ICOM_OKA, it still gave the error message and stopped.

Then, *while again running the other receiver control program*, I started ICOM_OKA. Why? On a hunch. OKA started and then immediately went to a "Com Port In Use" screen. It then continued loading without error and asked me to pick a com port and properties. Rejoice!

Needless to say, I picked a valid radio and controller address (08), shut down the other control program and then let OKA continue. It has worked great ever since. Moral: **Do not mess with the serial port parameters!**

❖ Sweet!

I think the R75 receiver has a similar control and memory operating system to the IC-703. Although I have not yet tried mine, it should have full computer functionality with ICOM_OKA.

For anyone with an ICOM, you will find ICOM_OKA a useful and valuable radio tool. It works great …and the price is right. Get it at **www.honeysw.com**

And the name Honey Soft? The author of ICOM_OKA is KD70KA, Howard Honig. His last name is German for honey.

continued from page 71

this scanner in the near term.

Bottom line, this is one heck of a scanner. This unit is the most advanced and feature rich radio scanner ever released by any radio company. No scanner in the marketplace even gets close to the BCD996T in features, listening capability, and overall performance, especially in its price range. There is a lot of scanning capability loaded into this small package. So if you are looking for one unit that does a lot, with the features you could only dream about three years ago, this is it – the first, truly high tech base/mobile scanner of the 21st century.

The Uniden BCD996T (SCN 49) is available from Grove Enterprises (1-800-438-8155 or /www.grove-enterprises.com) For $539.95 plus shipping.

Table Two: Miscellaneous Specifications

Receiver type – Triple Conversion

Dynamic allocation capacity –
Systems: 500 maximum; Groups: 20 per system; Sites: 1000 maximum (all)/256 per system; Channels: up to 6000 (3000 typical); Channels per trunk system: up to 250.
Operating temperature –
Normal –20°C to +60°C; Close Call –10°C to +60°C; Storage -30°C-+70°C
Scan rate –
100 channels per second (conventional mode)
Search rate –
300 steps per second (5 kHz step only) maximum
Audio output –
2.6W nominal into 8-ohn speaker; 30mW nominal into 32-ohm stereo headphone
Power Requirements –
DC 11.0V to 16.6V via Cigarette Lighter Cord or DC Cord with Orange Wire, AC Adapter (AD-1009) all included.

External Jacks:
Antenna Jack – BNC Type 50-ohm nominal impedance
Phone Jack – 3.5-mm (1/8-inch) Stereo Type
External Speaker Jack – 3.5-mm (1/8-inch) Monaural Type
Record Out Jack – 3.5-mm (1/8-inch) Stereo Type
DC Power Jack – 5.5-mm center pin positive and Orange Wire Jack : Three pin (Center Orange Wire)
Remote Interface Jack – Four pin mini type
GPS Interface Jack – D-sub nine pin (male type)

Note: Features, specifications, and availability of optional accessories are all subject to change without notice by the manufacturer. Information presented above was based on the test unit provided by the manufacturer. Specifications certificated accordance with FCC Rules and Regulations Part 15 Subpart C as of date of manufacture.

What's NEW

Tell them you saw it in Monitoring Times

Icom 2500

As noted in this month's review of the Icom IC-R1500, Icom America has announced another new receiver, due out in July. The 2500 series consists of a PC controlled wideband receiver, PCR2500, and a mobile/base station, the IC-R2500, at a street cost of around $850.

The new Icom IC-PCR2500/ IC-R2500 receivers offer all the advanced features of the recently-released PCR1500 and R1500 receivers, plus dual-diversity reception, allowing you to monitor two frequencies simultaneously, and automatic receiver selection between two antennas for best signal. Offering continuous 495 kHz to 3299.9999 MHz (excluding cellular bands on consumer models) and all modes (AM/FM/WFM/USB/LSB/CW), the low-profile PCR2500 is controlled by your computer. If you select the R2500, you can choose between computer control or stand-alone, mobile or base operation with the full-featured front panel

In addition to the two separate receivers, the 2500 series introduces two new internal modules: The UT-122 P25 digital voice decoder, UT-106 AF DSP unit, and UT-108 DTMF decoder or UT-118 D-Star digital voice decoder. For more information, price, and availability, visit **www.grove-ent.com** or watch *Monitoring Times* for a product review.

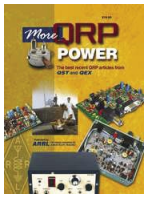
Icom has also re-released its wideband IC-R8500 professional receiver, but only in the unblocked version which is limited to qualified government or overseas sales.

ARRL Book Reviews

By Larry Van Horn, N5FPW

More QRP Power

Operating QRP (low power) is a lot of fun. Ask any ham who has done much QRP operating: All will tell you that there is no greater challenge in hamdom than operating QRP. In fact, the two November Sweepstakes first place QRP contest plaques on my shack wall mean more than almost any of the others.



QRP means radio operating with low power – five watts or less. If you are used to operating with a 100 watt transceiver, you may wonder, why anyone would do this?

Hams enjoy the magic of communicating over the air with their own equipment, without the benefit of the billions of dollars worth of infrastructure working behind the scenes to power the telephone and the Internet. QRP operators take that one step further, communicating over the air with simple equipment and antennas and only a few watts of power. They savor the satisfaction that comes with finishing a challenging radio contact, either within their own country or with a DX (distant) station. They enjoy assembling a QRP station that they can take anywhere, getting on the air with a homebrew radio the size of a paperback book, and using an antenna that they can fold up into a briefcase or knapsack.

In the spirit of the popular ARRL *QRP Classics* and *QRP Power* published in the 1990s, *More QRP Power* is an anthology of articles from recent issues of *QST* and *QEX* magazines covering construction practices, transceivers, transmitters, receivers, accessories, and antennas. This new book from the ARRL has dozens of projects and articles to help you assemble or improve a QRP station for home or travel.

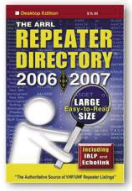
Whether you are a newcomer to QRP operating or you are already addicted, this new anthology is just the ticket for the QRP operator. This 176 page, first edition book is published by The American Radio Relay League, Inc. ISBN number 0-87259-965-5, ARRL book number 9655. *More QRP Power* retails for $19.95.

The ARRL Repeater Directory

The League has released their *ARRL Repeater Directory* in two new formats for 2006-2007 – pocket-sized book, or the new easy-to-read desktop edition. This new edition includes 20,389 listings for VHF/UHF repeaters across the US and Canada.

Some of the new features in this release include: IRLP, WIRES-II, and Echolink (Internet linked) amateur nodes, emergency message handling procedures, and a transceiver memory log.

There are the regular features that we have come to expect in this guide each year, including: Repeater operating practices, repeater lingo and hints for newly licensed hams; frequency coordinator contact information; using CTSS tones and Digital Coded Squelch (DCS); VHF/UHF band plans and 2-meter channel-spacing map; and tips for handling interference.

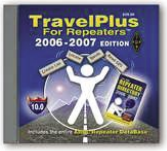


If you are into amateur repeater operation, then *The ARRL Repeater Directory* is your standard reference. The pocket-sized book (3.25 x 5.25 inches), 35th edition, is ISBN 0-87259-958-2 or ARRL book number 9582 for $10.95. Desktop edition (6 x 9 inches), ISBN 0-87259-959-0 or ARRL book number 9590. It retails for$15.95.

TravelPlus CD-ROM

If you want a high tech solution to working with repeater frequency information, you should get the *ARRL TravelPlus for Repeaters™ CD-ROM with BONUS Repeater Directory*. Now you can have the power of *The ARRL Repeater Directory*® on your computer.

Using this new CD-ROM version, you can locate ham radio repeaters along US and Canadian travel routes using this map-based software. Map your travel route and tune into the action on amateur radio repeaters along your route. This new version supports GPS operation (with separate external hardware*). You can view and print maps and repeater lists. In addition to the mapping function, you can also access *The ARRL Repeater DataBase*, global Internet linked nodes, AM/FM radio, broadcast television, and NOAA weather stations, which are included on this CD.



Not only can you access the data on the CD, but you can also export the data on this CD and transfer it to your Palm™ or Pocket PC if they meet the requirements.

The *TravelPlus* CD-ROM Version 10.0 with bonus *ARRL Repeater Directory* is ISBN 0-87259-960-4/ ARRL book number 9604. It sells for $39.95.

*Cable and adapter purchased separately (not supplied with *TravelPlus*). Palm is a trademark of Palm, Inc.

The ARRL DXCC List

This April 2006 Edition of the *ARRL DXCC List* is the official source of amateur radio DXCC information. Use the log pages to record the DX Century Club entities you've worked and QSLed. The *DXCC List* includes a complete listing of DXCC rules, including the latest changes and clarifications. It includes the current entity list, deleted entities, and recent DXCC entity additions. Also included is a prefix cross-reference, the list of international call sign series, and much more. Descriptions of all DXCC awards are covered, and information about how to get numerous DXCC items, such as pins and plaques.

This is a "must have" for every DXer. This new April 2006 edition carries an ISBN number of 0-87259-961-2 and ARRL book number of 9612. It sells for $5.95.

You can order any of the above new ARRL publications or any other League publication online at **www.arrl.org**, or via their toll free order line at 1-800-277-5289. The snail mail address is ARRL, 225 Main Street, Newington, CT 06111-1494. Be sure to include shipping and handling.

Books and Equipment for announcement or review should be sent to What's New, c/o Monitoring Times, 7540 Highway 64 West, Brasstown, NC, 28902. Press releases may be faxed to 828-837-2216 or emailed to Rachel Baughn, editor@monitoringtimes.com.

AOR SR2000 Frequency Monitor

Seeing is Believing!

High Speed FFT Search – Scans 10 MHz in as little as 0.2 seconds! Instantly detects, captures and displays transmitted signals.

- **FFT (Fast Fourier Transform) high speed display**
- **Displays up to 10MHz of spectrum bandwidth**
- **5 inch TFT color LCD display**
- **Waterfall (time) display function**
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