

Scanning -- Shortwave -- Satellites -- Ham Radio -- Computers -- Internet

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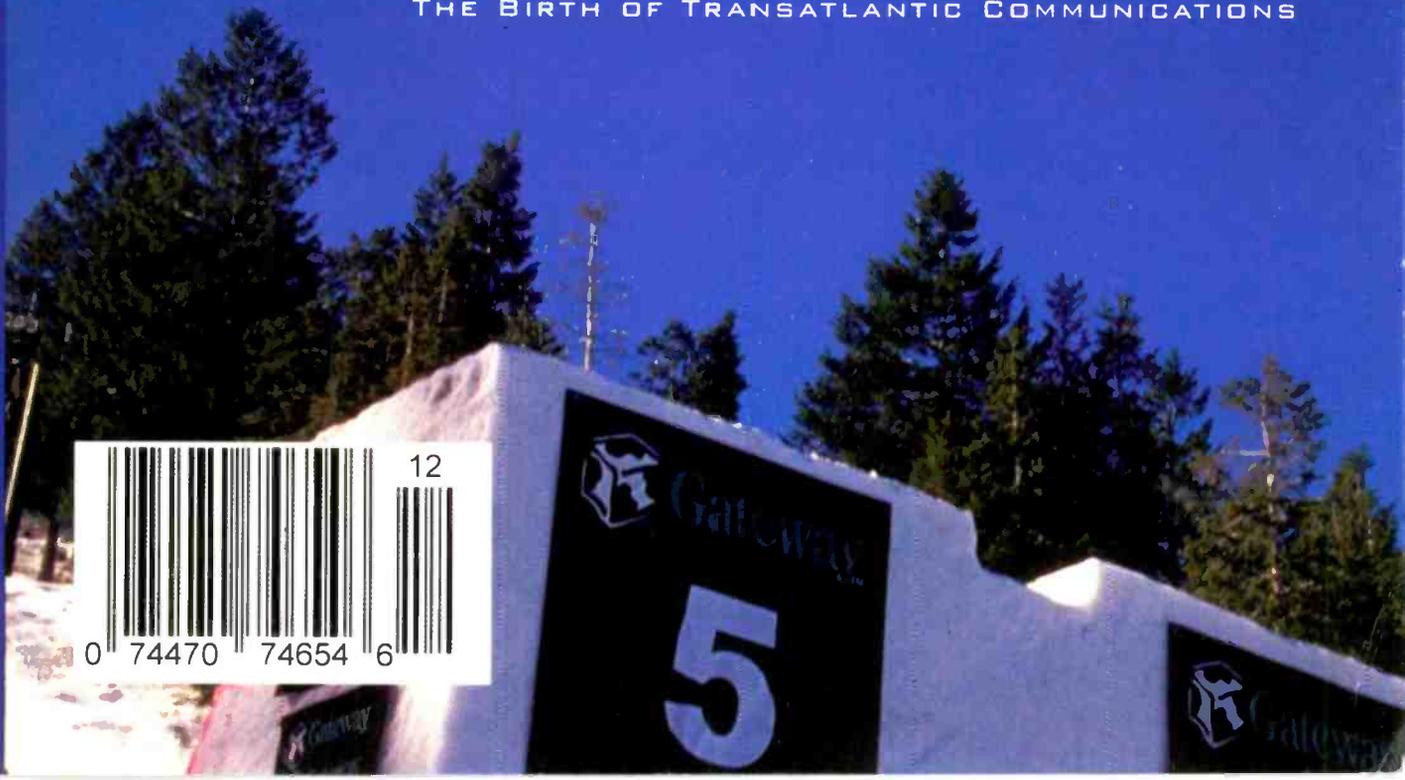
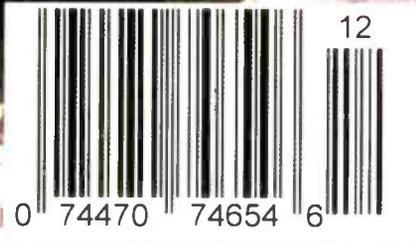
Monitoring Times



2002 OLYMPICS HIGH-FLYING FREQUENCIES

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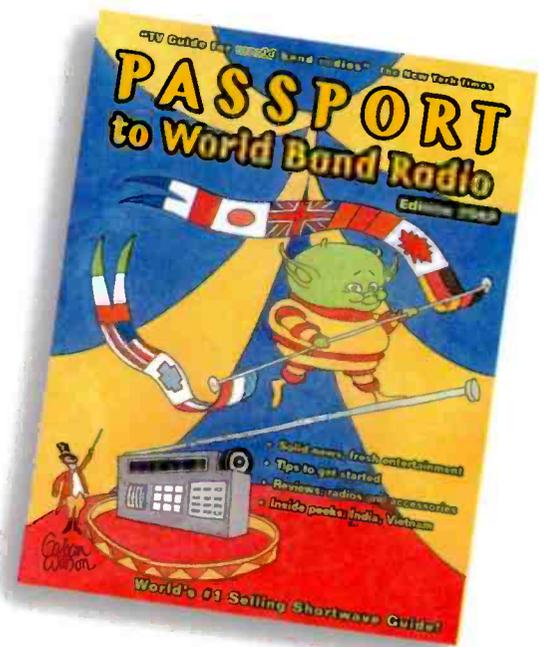
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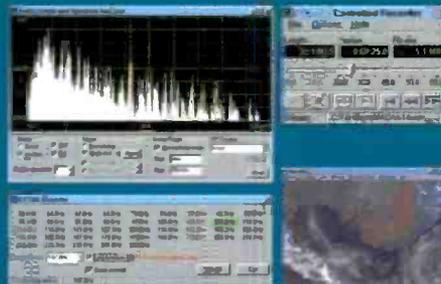
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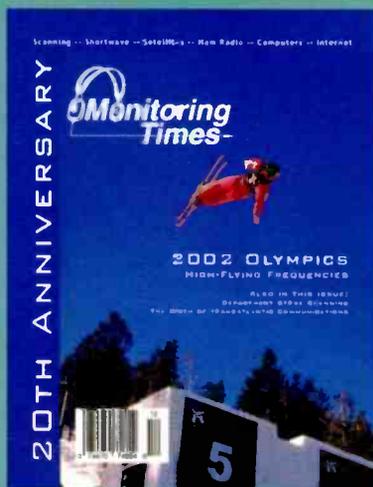
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Vol. 20, No. 12 December 2001



On our Cover

The 2002 Winter Olympics

By Jon Van Allen

The Olympic Games always present a huge challenge to any hobby monitor. It includes multiple venues, civilian, federal and military agencies, foreign countries, and media from around the world. All of them will rely on radio for communications and all the frequencies must all be coordinated.

The good news is, radio activity can likely be found on every available channel. The bad news is, it's extremely difficult to know in advance who can be found where. Jon Van Allen and the Rocky Mt. Radio Association Scanner Listeners Group have been working for two years to follow Salt Lake City's preparations for this world class event, and this article is their best guess on where to tune your scanner to find the action. The story starts on page 10.

Olympic photos by Lori Adamski-Peek courtesy of the Park City Visitors Bureau.

Marconi's Atlantic Adventure 14

By Ian Poole

December 12th marks one hundred years since Marconi first received the radio transmission of the letter "S" from across the Atlantic. The odds were really stacked against Marconi: his lack of schooling, the "best" scientific thinking of the time, the destruction of his antennas, and even the weather. In fact, some initial skeptics questioned the reception, though they were silenced when he later repeated the accomplishment.

Now that we know more about propagation, even some modern-day experts have questioned whether Marconi really received the primary signal. In a sidebar story, Bart Lee demonstrates why we have every reason to believe he did.

SWLing from the West Coast 18

By Stewart McKenzie

If you are traveling to California or if you're a brand-new shortwave listener who lives there, this article by the General Manager of the American Shortwave Listener's Club will help you select a radio and get started tuning in the most promising stations and frequencies for easy reception. Listening really is different on the "left coast."

Department Store Scanning 20

By Bob Eisner

Just in time for Christmas comes this update to Bob Eisner's list of chain store frequencies. Macy's, Bloomingdale's, Banana Republic, Wal-Mart - they're all here. Enjoy yourself while the family goes shopping (you're all finished, right?)!

MT Celebrates 20 Years 22

By Rachel Baughn

Monitoring Times has just completed 20 years of publication with this issue. Here's a nostalgic look at columns and columnists no longer with us but who helped us get where we are today. How many can you recall?



Lori Adamski-Peek

Life isn't just a game,
it's "THE" game.

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VR-500 Carry the world with you. (left) Providing continuous coverage from 100kHz–1299.99MHz (cell blocked), the 500 includes reception of narrow and wideband FM, SSB, CW and AM. Featuring auto mode and frequency step selection, it aligns the user with standard configurations in use worldwide. It also sweeps a band, noting activity, quickly moving to active channels. 2.3" w x 3.7" h x 0.9" d, 7 oz. © **\$199.99**

VR-120 Professional-grade monitoring in the field. (right) The 120 provides continuous coverage of 0.1–1299.99MHz (cell blocked). This receiver features straightforward 4-button operation, a BNC antenna connector, preset mode for quick tuning, four one-touch memories, 640-channel memory system, and a wide selection of scanning functions. The 120 can operate up to 20 hours on two AA batteries and the battery saver feature cuts battery consumption when no signal is there. 2.3" w x 3.3" h x 1" d, 6.9 oz. © **\$129.99**



FRG-100B High performance receiver for high priority listening. (top) The FRG-100B covers 50kHz–30MHz (CW, SSB, AM and optional FM). It also features 50 tunable memories, multi-function scanning, all mode squelch, noise blanker, CAT system for PC control, and backlit LCD. 9.38" w x 3.5" h x 9.5" d, 6.6 lbs. © **\$479.99**



VR-5000 Multi-mode scanning for world events coverage. (bottom) The 5000, with 2000 alphanumeric memory channels and direct keypad frequency entry, provides continuous coverage from 100kHz–2.6GHz (cell blocked). Along with a wide variety of scanning capabilities, it features dual receive, auto memory loading, bandscope activity monitor, world clock and time zone map. 7.1" w x 2.75" h x 8" d, 4.2 lbs. © **\$699.99**

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Reviews:

John Catalano tests two more pro-
 grams to control the do-everything BC-
 780XLT trunk Tracker – the veteran
 ScanCat Gold 8, and the newcomer
 ScanPro BC780XLT (page 82). Jock
 Elliott gets psyched when he finds the
 Tech Link Hands-Free Walkie Talkies
 at WalMart for less than half what you'd
 pay for FRS radios; he should have
 taken the clue when he found them in
 the toy department (page 86). The AOR
 TDF370 Multimedia Digital Terminal
 has a daunting name, but it is a very
 handy accessory which not only de-



Uncle Skip's Shopping Tips on Page 74

codes digital transmissions, but it also
 does an excellent job of digital audio
 processing; see the review on page 87
 and the recommendation on page 74.

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LISTEN TO THE WORLD

Frequency schedules and broadcaster information as updated by

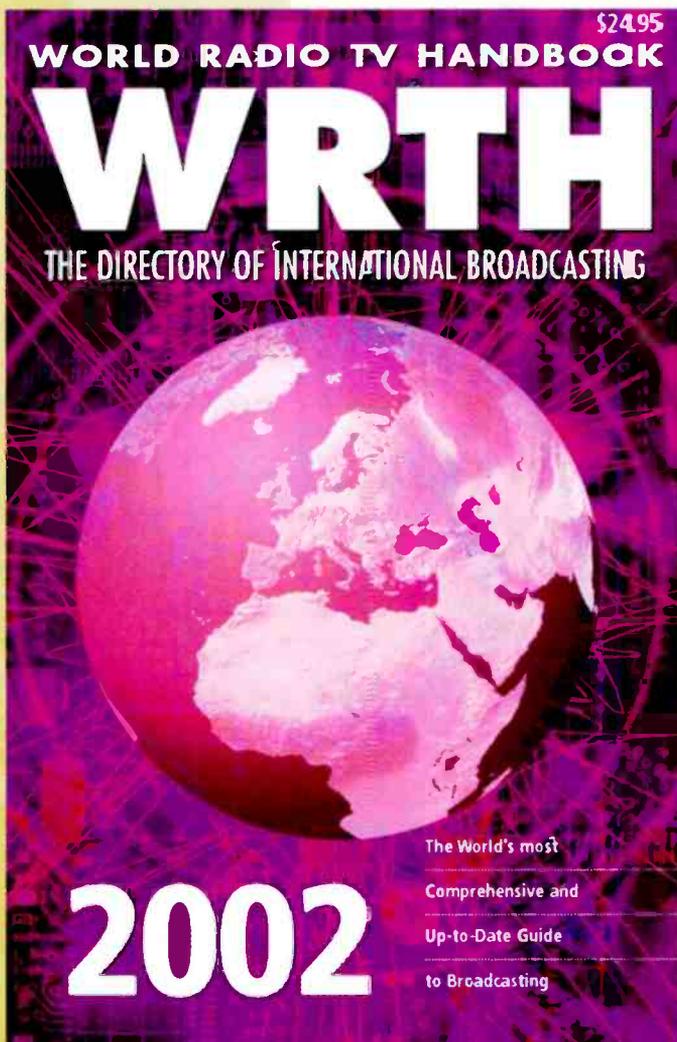
Teresa Beatrice Albreu, Olle Alm, Jorge Aloy, Rogildo Fontenele Aragão, Herman Boel, Héctor García Bojorge, Ruud Brand, Jordi Brunet, Bryan Clark, Marcelo A. Cornachioni, Svetomir Cuckovic, Alok Dasgupta, Alan Davies, Edward Dunne, Roberto Elizondo, Nicolás Eramo, Bernt Erfjord, Bengt Ericson, David Foster, Yimber Gaviria, Aivars Ginters, Victor Goonetilleke, Keith Gough, Rudolf Walter Grimm, Henrik Hargatai, Wolf Harranth, Stig Hartvig-Nielsen, Karel Honzik, Jose Jacob, Richard Jary, Dave Kenny, Anatoly Klepov, Thorir Knutsson, Hans-Joachim Koch, Erik Koie, Tetsuya Kondo, Váshék Korinek, Miroslav Krupieka, Ancejs Kuznecovs, Tore Larsson, Zacharias Liangas, Kai Ludwig, Carlos Malcondado, Bjorn Malm, Ruben Guillermo Margenet, Humberto Molina, Dario Monferini, Winter Monges, Cláudio Rótolo de Moraes, National Radio Club, Inc., Horacio A. Nigro, L. Oberto, Paul Ormandy, Alexey Osipov, Rumen Pankov, Anker Petersen, Andy Reid, Mauno Ritcla, James Robinson, Rafael Rodríguez, Ibrohim Rustamov, Roberto Scaglione, Djaci Franklin Silva, Arnaldo Slaen, Juan Francisco de la Torre Perez, Bernd Trutenau, Mahendra Vaghjee, Thierry Vignaud, Torgeir Woxen, John Wright, and the WRTH team

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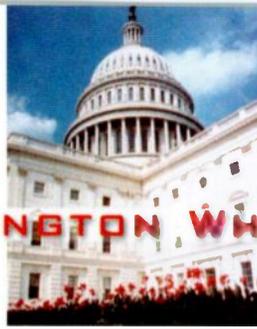
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PUBLISHED DECEMBER 2001



FCC Adopts Software-Defined-Radio Rules

The SDR is viewed as a critical technology to satisfy requirements for interoperability among the various services and with foreign allies, as well as a means to achieve information superiority, operational flexibility, and cost benefits. SDR has tremendous potential in the near-term to accommodate multiple bands/standards in the United States and internationally to integrate third generation (3G) wireless applications. SDR technology has the potential to unite a world of diverse standards and technologies, and frequency bands. Federal law enforcement agencies have also considered SDR as a possible solution to satisfy interoperability communication and multi-band radio requirements. NTIA recommends that the Commission work with industry representatives to ensure that SDRs comply with the table of frequency allocations, including having the ability to lockout or prevent access to certain frequency ranges, waveforms, and combinations thereof. (NPRM comments: NTIA)

At its open meeting September 13th, the FCC adopted rule changes to authorize and deploy a new generation of radio equipment known as software defined radios (SDRs). The SDR *First Report and Order* removes barriers to entry of SDR-enabled products into the marketplace. The new rules will allow manufacturers and operators to reconfigure devices after they have been deployed in the field and will speed the introduction of advanced technology and new services.

The new rules say software modifications in a SDR can be made through a "permissive change," which has a streamlined filing process; the FCC ID number will not have to be changed, and equipment won't have to be relabeled. The FCC also will permit an optional "electronic label" for SDRs, in which the FCC ID number could be displayed on a LCD or similar screen. It will allow another party to obtain an equipment approval in its name, becoming responsible for compliance instead of the original grantee. The commission also adopted requirements saying a grantee must take "adequate steps" to prevent unauthorized software modifications to radios, but it declined to set specific security requirements.

What are Software-Defined-Radios (SDR)?

In a sentence, they are radios that can change their frequency, bandwidth, and modulation scheme through software programming. SDR provides an efficient and comparatively inexpensive mechanism for the design and implementation of multi-band, multi-mode, multi-function radios that are able to adapt to all existing and future communication systems without the need to purchase new hardware.

The term software-defined-radios (SDRs) is used to describe radio transceivers that provide software control of a variety of modulation techniques, wide-band or narrow-band operation, communications security functions (such as hopping), and waveform requirements of current and evolving standards over a broad frequency range. Nearly every radio frequency (RF) attribute of an SDR subject to regulation is potentially controllable via software.

The frequency bands covered may still be constrained at the front-end requiring a switch in the antenna system. Digital signal processing (DSP) techniques are key to the implementation of SDR. However, all RF communications eventually requires an analog interface with the antenna for transmission and reception. This requires all SDRs to contain some analog components that clearly are not software defined but may be software controlled.

Advantages

Software defined radios can be quickly reprogrammed to transmit and receive on multiple frequencies in different transmission formats. This could promote more efficient use of radio spectrum.

SDR technology can allow one radio to interface with multiple telecommunications services and could be incorporated into other products such as laptop computers, personnel digital assistants, and automobiles.

Current frequency allocations for public safety land mobile channels are scattered over five disparate segments of the frequency spectrum between 25 MHz and 1 GHz. There are public safety frequency allocations in 30-50 MHz (VHF Low Band), 162-174 MHz (VHF High Band), 406-420 & 450-512 MHz (UHF), 764-776 & 794-806 MHz (700 MHz), and 806-940 MHz (800 MHz). Radios in one band cannot currently interoperate with radios in another band, and police and Federal law enforce-

ment agents are often forced to carry multiple radios in vehicles and on their person. SDRs capable of operating in multiple frequency bands are considered a solution to the public safety interoperability problem.

Regulatory Procedures

Under the new rules released September 13, 2001, software modifications in a software defined radio can be made through a "permissive change," which has a streamlined filing process. The FCC identification number will not have to be changed, so equipment in the field will not have to be relabeled. These permissive changes can be obtained only by the original grantee of the equipment authorization.

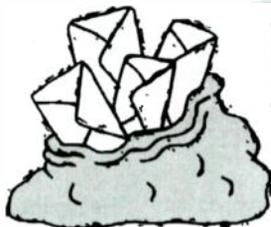
To allow for changes to equipment by other parties such as software developers, the Commission will permit an optional "electronic label" for software defined radios, in which the FCC identification number could be displayed on an LCD or similar screen. It will allow another party to obtain an equipment approval in its name and become the party responsible for compliance instead of the original grantee.

The Commission also adopted the proposal in NPRM to require that a grantee must take adequate steps to prevent unauthorized software modifications to radios, but it declined to set specific security requirements at this time.

The SDR Forum particularly welcomed the new rules. This is an international industry association which numbers more than 125 commercial, defense, and civil government organizations, and includes wireless service providers, network operators, component and equipment manufacturers, hardware and software developers, regulatory agencies, and academia.

The cellular phone industry said using SDR technology, a consumer traveling to a foreign country with an incompatible cellular network could connect to the Internet and download the needed software. SDR technology also permits radio manufacturers to make lower-cost, generic, "open architecture" radio transceivers which can be concluded, enhanced or customized with software at the point of sale depending upon the needs or preferences of the customer.

Software upgrading also permits operators to update their equipment without having to purchase a completely new radio. For example, a customer could purchase a Smart Card containing the new application software from the manufacturer and insert it into his radio.



LETTERS TO THE EDITOR



Dear sir, I am VU2COT, Bangalore suresh (BOB) A Ham Radio Operator Who was with u at red cross NYC, It was very nice working with u ,u are great happy looking man with a clear smile.

Amateur Radio in Disaster Relief

– a private citizen's eyewitness report

By Bart Lee, KV6LEE (blee@slksf.com)

(The demands placed on Amateur Radio on September 11 were a clear illustration of the maxim: "One does not 'rise to the occasion,' one sinks to one's level of training.")

Within minutes of the terrorists' attack on the World Trade Center, amateur radio went on the air in disaster relief. A month later, I am left with a powerful sense of pride in how amateur radio volunteers stepped into the breach, took real personal risks, and put radio to work when all else failed.

We learned all too much from this terrorism, but one of the good things was how much difference amateur radio can make for the good. The New York Radio Amateur Civil Emergency Service (RACES) net, Guy Richman, KC2AYG, net control, went up on the air within minutes of the disaster. (RACES NYC had been located in WTC7 – the most secure building in New York.)

On two meters, 147.000 MHz served as the net's main frequency for many days and nights, 24/7. Mark, KC2ENI, took the net at night. D-day VHF ham traffic that I monitored related to hospital utilization and out-of-state DMAT (disaster response) teams. The New York City Fire Department was coordinating on 154.37 MHz.

The next day I volunteered at the Red Cross. The communications chief, Jay Ferron, N4GAA, put me to work with Charles Hargrove, N2NOV, the ARRL Section Emergency Coordinator, and John Kiernan, KE2UN, for the Red Cross. Jay did a magnificent job getting amateur radio communications into each of a dozen Red Cross Shelters and three Office of Emergency Management sites for 24 hours a day for nearly two straight weeks. All hams volunteered from all over the metropolitan area, and several states. (I happened to be visiting from California, as

was Don, K6QDT, who cured our transmitter problem the second night.) Westchester RACES supplied many trained and capable radio operators day in and day out, as did New Jersey.

As many as 100 or more hams each day involved themselves on either the day shift or the night shift. I was night-shift trick-chief for the first week and had the privilege of working with almost all of the volunteers, as did John, KE2UN, on the day shift for the first week. We knew many of our best radio ops simply by name and callsign, such as Kevin, KC2CPF.

We never had too few volunteers, each of whom had trained himself (and herself) to do whatever it takes. We had hams from several countries helping as well, such as Russia, India, Canada, and the Leeward Islands.

Amateur radio operators worked in "the hot zone" at unknown but real personal risk, and at many shelters, and all put in long days and long nights insuring that traffic got through. In the first several days, cell phones and landlines either simply did not work, or were spotty at best. Vaunted high technology fell to earth, but hams with their own radios and equipment stepped in for effective emergency communications. Some of the earliest traffic I personally handled at Red Cross headquarters was an emergency evacuation order, sent out on a handheld transceiver into a jury-rigged Yagi antenna.

For the hot zone we issued dust masks and special credentials, and everybody got a disaster-worker orientation and later a de-brief. The Red Cross transported the radio ops into and out of Manhattan from Brooklyn after transferring New York operations there on the fourth day. The Red Cross coordinated its transportation on its own 800 MHz repeater system, but the hams stayed in communication especially to insure that a radio operator whose shift had ended got back to base. National Headquarters sent up a new communications van with John Perry, N1EOD, which was very useful during the move to Brooklyn.

The shelters kept track of their clients, staff, security, etc. and Red Cross polled them regularly by radio for these numbers, in a subnet to RACES. Once telephones worked, that traffic came off the RACES net. Red Cross sent Multi-disciplinary Outreach Teams into lower Manhattan around Day Eight. They tried to communicate via email over cell phones, but only amateur radio worked reliably, at least at first.

The work was exhausting. After nine days, I turned my job over to my replacement, Brian Fernandez, K1BRF. I came home to California stunned by the terrorism, but proud of all the Americans I saw and worked with in New York, especially the hams. 73. (See Lee's story on p. 16 - ed.)

Noise Annoys

"I am a long time subscriber to *MT*. I wanted to make a few clarifications for your answer to the question of "phase noise" and "synthesizer noise" (from the October *Ask Bob* column).

"As the name implies, **phase noise** is the variations in the phase of any oscillation. This could manifest frequency of oscillation. In general, the phase noise is a measure of spectral purity (or density) of frequency components certain amount offset from the oscillation frequency, such as -80dBc/Hz at 10kHz from the center. Here dBc denotes dB from the carrier magnitude and the noise is normalized to a bandwidth of 1Hz to make a better sense in comparing different oscillators.

Reader Ozguc goes on to compare the different types of noises:

Thermal noise generally arises from the heating effects of resistive components; this is wideband noise.

Flicker noise (1/f) is usually derived from traps, dislocations and impurities in the crystal lattice. It decreases as frequency increases.

Shot noise develops in the higher energy required to overcome the junction barrier in diodes and transistors to allow current flow.

Although pure capacitance and inductance do not generate noise, they do "color" it through their filtering effects, the intensity of the noise then being a function of its frequency and current through them.

Phase noise is an up-conversion (or modulation) of these noise types into the band of interest.

Synthesizer noise, on the other hand, refers to phase-locked loops (PLLs) used to convert one frequency of oscillation to another, as in the local oscillator which starts with a single crystal frequency reference.

PLLs obtain a phase and/or frequency lock by means of a phase loop, and the dynamics of that loop (VCO, filter, etc.) determine the phase noise.

– KE6TLN Ismail H. Ozguc, Ph.D, San Jose, CA

We welcome your ideas, opinions, corrections, and additions in this column. Please mail to **Letters to the Editor**, PO Box 98, Brasstown, NC 28902, or email mteditor@grove-ent.com. Letters may be edited for length and clarity. Happy monitoring!

–Rachel Baughn, KE4OPD, editor

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Radio Maneuvers

In a country where politics, drought, and decades of war have reduced its ancient cultures to an almost primitive battle for existence, knowledge of the outside world is possible only through radio. In the battle for the hearts and minds of the people of Afghanistan, radio is one of the critical fronts in the "new kind of war" against terrorism.

As was the case in the Balkans, early targets for U.S. attacks were transmitting sites – both broadcasting and communications. According to overseas monitors, the Taliban-backed Voice of Shari'ah was knocked off the air October 8th. The Voice of Shariah was the sole broadcaster in Taliban-controlled areas of Afghanistan, and described itself as the only broadcaster in the world where music of any kind is banned.

Several countries are actively filling the information void. The BBC, Voice of America, and Radio France International quickly increased local language shortwave transmissions to Afghanistan. Other broadcasts in Pashto/Dari to Afghanistan include Radio Pakistan, China Radio International, All India Radio, Deutsche Welle, Radio Cairo, Voice of the Islamic Republic of Iran, Voice of Russia, Tajik Radio and Radio Tashkent.

The U.S. has also been broadcasting via medium and shortwave from its Commando Solo aircraft, operated by the 193rd Special Operations Wing of the Pennsylvania Air National Guard. (See *MT* feature article by Hans Johnson, June 1999.) To publicize the broadcasts, the U.S. dropped leaflets for "Information Radio," listing the frequencies – sideband shortwave channel (8700 kHz), and two frequencies formerly used by the Voice of Shari'ah, 1107 kHz and 864 kHz.

BBC Monitoring Service reported hearing Information Radio announcements in Dari and Pashto languages. "Announcements monitored on 15 October 2001 told the 'noble people of Afghanistan' that 'the forces of the United States are passing through your area'. 'We have not come here to harm you', the broadcast continued, 'We have come to arrest Usamah Bin-Laden, Al-Qa'idah and those who support him'. The announcer then advised people to stay at home for their own safety. 'When you see US forces and aircraft you should seek protection in some places and remain there until we leave your area completely'."

DXers in the US have occasionally heard portions of the 8700 kHz broadcast. Propagation characteristics have led some to speculate the transmissions may originate in Diego Garcia. However, the modified EC-130 is also capable of transmitting on shortwave with a trailing wire from the rear of the aircraft. The BBC lists the broadcasts as occurring at 0030-0530 and 1230-1730 UTC daily.

Since radios are scarce and fresh batteries are hard to find, the U.S. military as well as aid organizations have put in orders for tens of thousands

of wind-up radios. The U.S. has air-dropped hundreds of wind-up radios custom-tuned to one channel. However, those ordered from Freeplay by humanitarian organizations will be capable of variable tuning.

Kristine Pearson, of the Freeplay Foundation says, "Information is absolutely vital in a humanitarian crisis ... "In this situation it is even more crucial because of the disinformation and misinformation that's rife. These people need to be able to rely on balanced and reliable broadcasts."



English translation of Arabic leaflet



Echelon's Information Glut

After a year-long study, an appointed committee made its report to the European parliament on the US-run Echelon global spying network, confirming that virtually no communication traveling via satellite is immune to being sucked up "much like a vacuum cleaner." While the international community was expressing its dismay at a spy system whose existence the U.S. hasn't even acknowledged, civil libertarians have been resisting a domestic version, dubbed Carnivore, which would search internet-based communications.

The events of September 11th produced a significant change in attitude toward both these information-gathering activities. While criticism has not been entirely swept away, such systems are being acknowledged for their usefulness in countering illegal activities.

German MEP Gerhard Schmid, who presented the EU enquiry report, said "Let's be honest. The intelligence services in most of the EU member states use strategic telecommunications control...The purpose is usually relevant: fighting organized crime, terrorism, trafficking in drugs, human beings. That's fair enough." And he said Echelon, except for some commercial spying, appears to be doing essentially the same.

The report recommended EU institutions and public bodies of member states "systematically encrypt" sensitive communications "so that encryption becomes the norm."

Echelon has its limitations, however. First of all, it gathers *so much* data that the National Security Agency (NSA) is drowning in information it hasn't had time to sort or decode. Secondly, Osama bin Laden seems to have caught on to Echelon: His satellite telephone conversations, which the NSA used to record, dried up last year. And, members of his terrorist group have learned to hide their real messages in email or graphics that do not trigger Echelon's alarm filters.

Big Ears for Broadcasts

A more benign form of eavesdropping is conducted by the BBC Monitoring Centre in Caversham Park. A 400-member team works around the clock to listen, summarize, and analyze what is being broadcast by the world media. For example, Jamil Asefi, a Caversham listener for 12 years, has been monitoring Afghan broadcasts.

He reported hearing the Radio Voice of Shari'ah telling the people that the food parcels dropped by the Americans were poisonous and any Afghans who ate the contents would be betraying their Islamic faith if they still took advantage of the US food aid. He also offered the opinion that US propaganda efforts to win over civilians in Taleban territory is striking the wrong note. "The Americans are playing dance music during these broadcasts. This is not what the population want to hear when they feel they are being bombed by all sides. It could be offensive to them."

"We are not eavesdropping," says Andrew Hills, the director of BBC Monitoring. "But the battle for hearts and minds is vital. The media has a great influence on public opinion and we can pick up the discrepancies that occur between what a country tells its own people and what it says outwardly."

Cold War Relics

It may be a sign of increased cooperation between Russia and the US following September 11th's terrorist attacks, or it may be a purely financial consideration. President Vladimir Putin announced Russia will be closing its radar base in Cuba – long a sore point between the US and Russia. The Lourdes station, which houses around 1,500 Russians to operate the radar and electronic equipment, was too expensive to maintain, he said. The US has long regarded it as a "spy base" for listening in on America. The US Congress voted last year to restrict financial aid to Russia unless it closed the base.

Followers of "spy numbers" stations will be very interested to see if the closing will mark a change in the "English Woman" (Enigma E17) and Spanish 5-digit (Enigma V2/V2a) broadcasts. Will it finally confirm if Lourdes or the Radio Havana transmitters are the source of the V2/V2A transmissions? The timing is certainly interesting, coming on the heels of the arrests of a high-level Cuban spy in Washington DC, and two others in Florida (see p. 32).

One thing's for certain: numbers stations in general won't be disappearing anytime soon. In fact, the United Kingdom has apparently invoked its "D" notice (which silences discussion of a subject that might jeopardize national defense) with reference to discussion of "shortwave espionage," i.e., numbers stations. The notice was received by

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the Conet Project, an encyclopedic compilation of information and recorded numbers stations on four CDs.

Akin Fernandez, director of the company, commented on the use of numbers stations in this day of modern technology. "It is astounding when you hear that shortwave is still being used in this way, but when you think about it, the way it works is so perfect there is no reason to change the system at all."

FRS for the Military

New technology usually flows from the government/military use into the public sector, but once in a while consumer electronics gets the jump on what works. Somewhat surprisingly, the military has taken a real interest in the short-distance, compact Family Radio Service radios. But, when *Mobile Radio Technology* magazine ran a story about Family Radio Service radios being used by an Army Explosive Ordnance Disposal (EOD) unit in Alaska, the frequency managers promptly confiscated the radios. The military is prohibited from using civilian frequencies.

Federal frequency managers have now cleared 14 channels on DoD frequencies for an FRS-like communications service called Intra Squad Radio (ISR). Channels of operation are as follows:

- 01) 396.875 MHz 08) 397.950 MHz
- 02) 397.125 MHz 09) 398.050 MHz
- 03) 397.175 MHz 10) 399.425 MHz
- 04) 397.375 MHz 11) 399.475 MHz
- 05) 397.425 MHz 12) 399.725 MHz
- 06) 397.475 MHz 13) 399.925 MHz
- 07) 397.550 MHz 14) 399.975 MHz

Last year the US Marines contracted with Icom America, Inc. to produce a special version of their rugged, water-resistant IC-4008A, dubbed the IC-4008M. The IC-4008M has now been opened for purchase by any Department of Defense agency. Some restrictions apply: only equipment specifically manufactured for ISR may be used; no modified equipment; no range-enhancing modifications, antennas or amplifiers are allowed; and ISR may not be used while airborne.

The Civil Air Patrol, which is eligible to use DoD frequencies, expects to use ISR for activities such as intra-team safety communications for ground teams; coordination communications for mission base, flight line, and convoys; and support for special activities such as airshows, fundraisers or encampments. U.S. Marine Corps is using their 13,000 radios at the infantry squad level to supplement hand and arm signals.

"Communications" is compiled by editor Rachel Baughn KE4OPD (meditor@grove-ent.com) from newscippings contributed by our readers. Thanks to this month's MT reporters: Anonymous, Albany, NY; Jenks Garrett, Weatherford, TX; Doug Robertson, Oxnard, CA; Brian Rogers, Melvindale, MI; Robert Thomas, Bridgeport, CT. Via e-mail: Mark Ansel, Roger Cravens, Robert Felton, John Figliozzi, Robert Foxworth, Alan Henney, Maryanne Kehoe, Bob Kozlarek, Ed Muro, Chris Pancheri, Ken Reitz, Doug Smith, Hugh Siegman, Larry Van Horn, Peter Vieth, Robert Wyman, George Zeller

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The 2002 Winter Olympics

By Jon Van Allen

Editor RMRA Scanner Listeners Group

The 2002 Winter Olympics will soon be upon us. Salt Lake City Utah will be host to the Games beginning on February 8th and you can be sure there will be plenty of scanning excitement even before the opening ceremonies.

Salt Lake City has been preparing for over five years for this world class event, modernizing the infrastructure, highways, sports arenas, ski areas and communications to meet the gargantuan task required to host the Olympics. Now that the dust from the Olympic scandal has settled, it is time for the Games to begin. If you plan to be in the area during the games, make sure your winter survival gear includes a scanner or two to keep up with the non-stop action!

Communications Networks

To accommodate the huge task of providing communications, the State of Utah built a huge Motorola Type-II Astro Smartzone trunked system. Known as UCAN (Utah Communications Agency Network), the state owns the equipment and leases radios and service contracts to participating police, fire, rescue, medical and hospitals in nine counties along the Wasatch Front. UCAN also provides much of the radio equipment for the Olympic venues, security, transportation, drug testing and scoring, etc.

UCAN operates at least 32 trunked repeater sites in nine

counties, all of which are linked together via microwave and landline. For the first time ever, all participating UCAN agencies are (supposedly) able to communicate via common talk-groups. However, while UCAN is the heart of the Olympic communications system, it is by no means able to provide all required communications.

For the duration of the Olympics (and at least a few weeks prior) portions of the radio spectrum are temporarily set aside for exclusive use by the countries participating in the Olympics. A good-sized chunk of business, government and amateur radio frequencies were "commandeered" by the FCC for the duration of the Olympics. There are so many different countries represented, they must have access to the frequency bands their radio and video equipment operate in. This means the US must provide those frequen-

cies and ensure they are not compromised. There is no need for further hints on where to monitor: every scannable frequency is fair game at the Games!

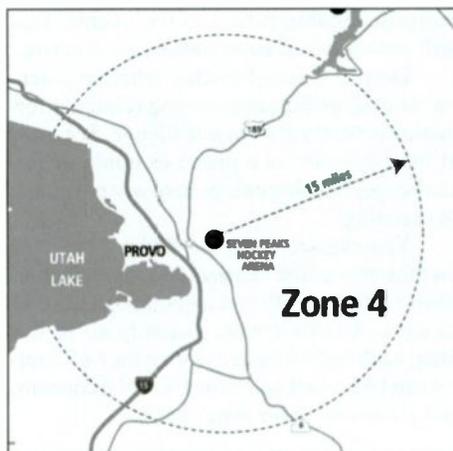
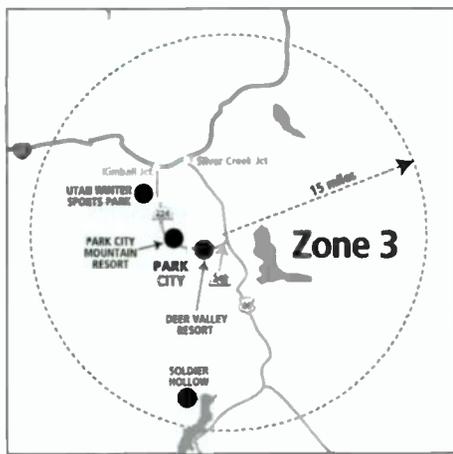
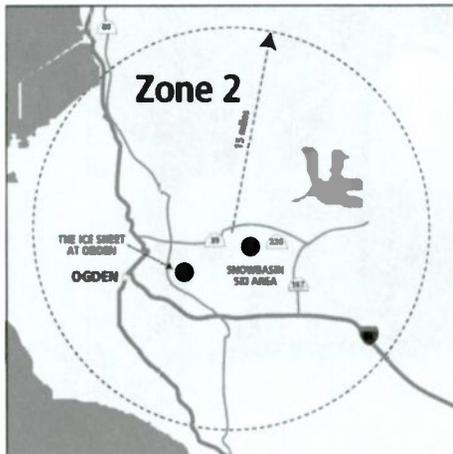
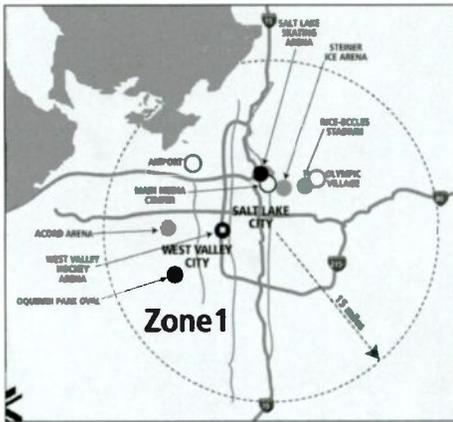
A Frequency Coordination Nightmare

As with any other major radio spectrum management situation, there must be frequency coordination. The Salt Lake Organizing Committee (SLOC) will act as frequency coordinator for the 2002 Olympic Winter Games. According to Olympic/Paralympic Radio Users Committee, which is a part of SLOC (<http://www.slocfrequency.com>), the FCC will assign Special Temporary Authorization (STA) for the radio spectrum used in conjunction with the Winter Games. SLOC will hold all STAs issued by the FCC and will assign frequencies to the registered users.

Users will be assessed a fee of \$250 per assigned frequency per zone at the time of assignment. Users will be assessed a sticker fee of \$10 per radio. As you can see from the Radio Frequency Operation Zone Map, there are four zones. In the case of the assessed "\$250 per assigned frequency per zone," I believe this could more accurately be described in many cases as "per assigned talkgroup per zone," since a trunked system will be handling the bulk of this radio traffic.

The FCC has been charged





with enforcing the availability of that spectrum, and has installed over a dozen receiving "pods" which can monitor virtually the entire spectrum from DC to daylight. These pods are interconnected and controlled by a central computer system which can pinpoint a signal's position to a few meters' accuracy in less than one second. The FCC has been up front in warning that unauthorized communications anywhere in the radio spectrum will not be tolerated.

During the emergency preparedness meetings I attended prior to the Olympics, the FCC convincingly demonstrated their resolve to swat flies with a sledgehammer.

As I write this article several months in advance of the Olympics, SLOC continues to hold regular radio users group frequency coordination meetings. According to Dave Hudson (<http://www.broadcast.net>), discussions included how to work with local license holders in the 800 MHz band to share spectrum for the UCAN trunked radio system. Local 2-way companies are working to identify frequencies that can be made available to SLOC for the duration of the competition. Additional 800 MHz frequencies may be available for use in terrain-shielded venues such as Park City and Snow Basin. SLOC is requesting endorsement letters from the licensees loaning the frequencies.

STAs have been requested for operation of radios outside of normal frequency allocations. SLOC has hired a consultant to deal with this issue. NBC is also taking an active part in coordination, and one of the largest areas of concern for NBC and the rights holder broadcasters is coordination of wireless microphones. It was reported that 40 channels of wireless mic were requested for the opening ceremony's stage production alone.

The proliferation of production and news crews in the venues will make coordination and strict enforcement a challenging task. We expect rules to be developed for radio users in two groups: frequencies below 1 GHz and frequencies above 1 GHz. SLOC reports that many requests for frequency coordination have been received and the overwhelming majority have been from broadcasters, both domestic and foreign.

The Challenge for the Scannist

The SLOC frequency website does not list frequencies, but rather how the system will work. Our job here is to figure out where in the radio spectrum your scanning event will be, which is not an easy task because of so many factors. Among the unknowns are what frequencies the multitude of different countries will be using for specific purposes.



Alta Marshall vehicle (Jon Van Allen)

We can't answer that with any degree of accuracy here. For example, some countries use the 420 - 450 MHz band for police, military, etc. In the US, this band is shared between amateur radio and other users. We can find many instances of this sort throughout the spectrum.

With so many different languages that will be spoken on so many unknown frequencies, our job is made somewhat easier by focusing on what we do know, or can reasonably expect to hear in a language we understand. Even so, the task of presenting a useful list of users, frequencies and talkgroups is

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Zone 1

Salt Lake Co Sheriff
859.7375 data
856.2375
856.9875
857.4625
854.5875
857.9375
859.4625
855.4625

SLC Police & Fire
857.2375 data
860.2625
866.0750
866.3500
866.8500
867.2500
858.2375
859.2625
855.2375
866.6000

UCAN Salt Lake Co Simo
(simulcast sites)
868.1125 data
868.5125
868.4125
868.0875
867.7250
867.6875
867.4250
867.4000
867.1750
867.1500
866.8750

UCAN Nelson Peak (SL Co)
868.5500 data
868.5750
867.9875
867.7500
867.1125
866.9000
866.7000
866.6500
866.1250
866.1000
866.0375

Zone 2

UCAN Weber Co Simo
868.9875 data
868.9625
868.2875
868.2375
867.9250
867.9000
867.6125
867.5875
867.3000
867.2750
866.9500

UCAN Mt. Ogden
868.9000 data
868.8750
868.6500
868.6250
866.8000
866.7625
866.5500
866.4375
866.1875
866.1500

Zone 3

UCAN Park City / Summit County
867.9375 data
867.6250
866.7750
866.4125
866.1375

UCAN Lewis Peak
868.9750
868.2250 data
868.2000
868.1375
868.0625
867.9125
867.6000
867.5375
867.3125
866.9625

UCAN Quarry Peak (not active yet)
868.6125
868.1625
867.8250
866.9375
866.0625

UCAN Wasatch County
868.9125 data
866.0375
868.4125
868.1750
868.5750
868.6500
868.8750

UCAN Clayton Peak
868.4750 data
868.7375
867.4875
866.9125
866.5875
866.2625

UCAN Strawberry Reservoir
867.2500 data
866.8500
866.6000
866.3500
866.0750

Zone 4

UCAN Utah Co Simo
867.6625 data
866.7250
866.9750
867.0875
867.3250
867.3750
867.6375
867.9500
868.0625

UCAN Sundance
867.4625 data
867.2125
866.8000
866.5500
866.1875

well beyond one person's ability. Even with 40 members of our local scanner club working on this project for the last two years, the task is still unimaginably difficult, because so much Olympic information is shrouded in secrecy out of security concerns. I will cover the known information and discuss tips for finding the unknown.

Where to start looking: I would expect some users to simply enter into a contract with existing SMR operators for the duration of the Olympics. It's anybody's guess what equipment or frequencies will be installed on a temporary basis near the venue areas, but it's a safe bet the majority of the venues themselves will be on the UCAN trunked system.

Perhaps some of this info will be available from the FCC's website in the months preceding the games. I would also expect Nextel to increase their capacity in Salt Lake City and Park City to accommodate increased demands by both commercial and non-commercial users, especially since many federal agencies use Nextel. But of course Nextel is all-digital, so we can't monitor it.

Salt Lake City Police, Salt Lake County Sheriffs Office and the Utah Highway Patrol will be providing a lot of the security at the venues in Salt Lake County. Other cities and counties will provide similar security for their venues. See the Rocky Mountain Radio Association (RMRA) website URL below for more specific information on frequencies and talkgroups.

I am certain there will be a federal trunked system or two operating in the 406-420 MHz band in addition to State Department Security, Secret Service and other federal users in this band. I would also be willing to bet there will be trunked systems pop up in the 900 MHz and possibly the 450-470 MHz band as well. Those of you with BC-780 scanners or running the popular Trunker program will want to make use of control channel scanning for 800 or 900 MHz systems.

The September 11th attacks in New York and Wash DC has prompted SLOC to increase security considerably. How this will affect monitoring remains to be seen, but you can count on a large National Guard presence as well as increased FBI, Secret Service and other federal agencies. Even though the feds will be using digital and encrypted radios, you should be able to hear at least some direct and plenty of indirect fed comms on UCAN. Sometimes



Lori Adamski-Peek

Photo Credit: Park City Visitors Bureau

the feds will have one side of a link encrypted and the other is in the clear.

It has been suggested that you may not be able to take a scanner into an indoor event (as was the case during the Atlanta Olympics), so you may have to monitor outside or enjoy the event without your scanner. The only way to find out for sure is to ask and hope they let you through. Regulations at outdoor events may depend on how close to the venue you are. There are various stages of security, so you will be able to scan from a distance. What that distance is remains to be seen.

We were told that no unauthorized radio gear will be allowed into the venues and FCC volunteers will check out all radios. As mentioned earlier, all authorized radios will have the special sticker with a bar code. So don't bring your ham gear, FRS, MURS or any other transmit-capable radios to the events; they will probably not be allowed past security.

Despite these obstacles, whether potential or real, gathering scanning related information is nearly always a challenge. Scanning at the Olympics is a prime example of this challenge. Nothing comes easy when it comes to scanning!

You can see from the Radio Zone map that the area of the venues is nearly 100 miles from north to south and a good 50 miles east to west. UCAN covers virtually all of this area; each individual city or agency of interest can be looked up on the UCAN frequency, talkgroup and radio zone charts.

Talkgroups

While I originally intended to list specific Olympic talkgroups, it appears they have undergone a shuffle for some reason. As SLOC obtained trunked radios for the various venues, they were assigned the block from 56000 though 58000. These have not been heard for several months, so their status is not known at this time. There have been rumors some users will be using digital and/or encrypted radios on UCAN, or they are currently using VHF high band radios until the Olympics. I cannot verify either scenario but it would be a safe bet that there will be Olympic related talkgroups active on UCAN. I would search for talkgroups between 56000 and 60000.

For other established talkgroups that are relevant to support of the Olympics, space limitations preclude publishing them here. A list of talkgroups for various police, fire, rescue/med and hospitals can be found on the RMRA website: <http://www.rmra.org/scan/index.html> and then click on the UCAN icon. Also check the RMRA website for other UCAN frequencies not shown as well as for Utah Highway Patrol and other agencies involved with the Olympics. You may also consult the May 2000 *Monitoring Times* cover feature on UCAN, but it will not be as up-to-date as these online sources.

Sporting Event Venue – Location (Radio Zone, see map)

Aerial - Deer Valley Ski Area (Zone 3)	University of Utah (Zone 1)
Alpine Super-G - Snowbasin Ski Area (Zone 2)	Mogul Freestyle - Deer Valley Ski Area (Zone 3)
Alpine Slalom - Snowbasin Ski Area (Zone 2)	Nordic Combined Skiing - Soldier Hollow (Zone 3)
Biathlon - Soldier Hollow (Zone 3)	Nordic Ski Jump - Utah Olympic Park, University of Utah (Zone 1)
Bobsled - Utah Olympic Park, University of Utah (Zone 1)	Olympic Stadium - Rice-Eccles Stadium, University of Utah (Zone 1)
Cross Country Skiing - Soldier Hollow (Zone 3)	Olympic Village - University of Utah (Zone 1)
Curling - The Ice Sheet at Ogden (Zone 2)	Slaloms - Deer Valley Ski Area (Zone 3)
Downhill Skiing - Snowbasin Ski Area (Zone 2)	Snowboarding Giant Slalom - Park City Mountain Resort (Zone 3)
Figure Skating - Olympic Skating Arena - SLC (Zone 1)	Snowboarding Halfpipe - Park City Mountain Resort (Zone 3)
Giant Slalom - Park City Mountain Resort (Zone 3)	Speed Skating - Olympic Skating Arena, Delta Center - SLC (Zone 1)
Ice Hockey - The Peaks Ice Arena at Provo (Zone 4)	Speed Skating - Oquirrh (pronounced O-kur) Park Oval - Kearns (Zone 1)
Ice Hockey - 'E' Center - West Valley City (Zone 1)	
Luge Track - Utah Olympic Park,	

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Marconi's Atlantic Adventure

By Ian Poole G3YWX



On 12th December 1901, amidst the noise of the wind howling outside the building overlooking St Johns, Newfoundland, and the crashes of the static being received, Marconi just managed to distinguish the sound of three short dots. They were the letter "s" in Morse code, and they were being transmitted from Poldhu in Cornwall, the other side of the Atlantic.

This was a tremendous achievement for the 27-year-old who had just refuted much of the scientific thinking of one hundred years ago by proving it possible to transmit wireless signals across the Atlantic.

Upbringing

Guglielmo Marconi was born in Bologna in 1874, the son of a wealthy businessman named Guiseppe. In his early years he travelled widely, accompanying his mother on her trips abroad. During his periods at home, he was given private tuition. Unfortunately, when he started to attend a college it was found that his previous schooling had been inadequate and he did not show any signs of his future brilliance. Eventually he left his formal education without any qualifications.

Despite this, his last years in education had left him with a keen interest in physics. Seeing this, his mother arranged some tutoring with a family friend named Professor Righi who was a lecturer at Bologna University. It was because of reading an article by his new tutor that Marconi became very interested in the newly discovered Hertzian Waves. Soon he started repeating and improving the experiments that Hertz had made just a few years before.

The Challenge of the Atlantic

From his very earliest experiments with wireless, Marconi had been interested in extending the distances over which he could send signals. Many scientists believed that wireless signals only travelled in straight lines and therefore would not propagate beyond the horizon. However, in 1898 Marconi was able to communicate between the Royal Yacht and Osborne House, Queen Victoria's residence on the Isle of Wight. These transmissions could still be heard even when there were hills between them, proving that wireless signals did not need a line of sight path.

Later in 1899 Marconi sent signals across the English Channel between South Foreland in England and Wimereaux near Boulogne in France. This received a great deal of publicity because it was the first international wireless link. But more importantly, the signals from Wimereux were received in Chelmsford, a distance of over 80 miles.

The realization that wireless signals could travel over such distances was of great significance. Although the way in which signals travelled over these distances was not known, Marconi began to wonder how far they could actually travel.

By mid-1900 Marconi was convinced that it would be possible to send signals across the Atlantic. He knew this would be an enormous undertaking as he would have to build a transmitter larger than any yet constructed and the antennas would also have to be very large. This would be an exceedingly expensive undertaking and his company was living on its capital and not returning any profit. If he were to succeed then he would need to use all his powers of persuasion to gain

agreement from the other directors of the company.

On the other hand, if it were possible to demonstrate that wireless signals could be sent from England to America, it would enable the large number of ships crossing the Atlantic to keep in contact with the shore during their passage. This would put Marconi's company in a far stronger position for new business. As a result, the Board agreed to the demonstration.

Preparations

Major Flood-Page, the Managing Director (President) of the company and R.N Vyvyan were assigned to select a suitable site in England for the test. They chose a site at Poldhu Point, about four miles from Helston in Cornwall (SW England). Plans for the buildings that would be required were put in place and construction started in October 1900. This included an enormous antenna system consisting of a cone of wires to be supported by twenty 200 feet tall masts that were to be erected in a circle 200 feet in diameter.

Up until now the transmitting and receiving equipment that Marconi had used was little more than laboratory equipment. For the Atlantic to be crossed, far higher power equipment was needed. To assist in its design and development Professor Ambrose Fleming, professor at University College London, was enlisted. (Professor Fleming was later to invent the diode tube).

Once the work at Poldhu was well under way Marconi and Vyvyan left for America to select the other site for the test. They chose to install their station at South Wellfleet, Cape Cod,

Massachusetts. With the site selected, Marconi left Vyvyan to construct the station whilst he returned to England.

Back in England significant progress was being made in many areas. Even without the Poldhu antenna complete, signals from the transmitter were regularly received at Niton on the Isle of Wight, a distance of about 185 miles, and also at another Marconi station in Crookhaven in Ireland, a distance of 225 miles. However, the construction of the antenna was proving to be more difficult. The weather was windy and it was not easy to construct or erect. Although the structure was known to have a weakness, the antenna design was retained for its technical advantages. Unfortunately, the gamble did not pay off: Even before all the masts were erected, a sudden change in wind caused a stay to come loose and all the masts came crashing to the ground.

This was a particularly serious setback. Costs for the project were rising and the company could ill afford a redesigned antenna. There were also doubts about the one in America with the same design, but as construction was well advanced it was decided to complete it.

They decided to replace the Poldhu antenna with one supported by four 200-foot tall wooden masts. Construction of these started at the beginning of November, and progress was rapid.

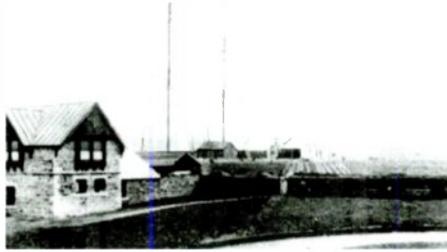
In view of the fact that very strong signals had already been received at Crookhaven and project costs continued to rise, it was felt that transatlantic tests should be carried out as soon as possible. As there was some uncertainty whether transmissions would be able to reach as far as Cape Cod, it was decided to send a message instead to the nearest point across the Atlantic, namely, Newfoundland. In late November, Marconi and assistants Paget and Kemp set off for Newfoundland with equipment for large inflatable balloons to raise a single wire antenna.

It was just as well that the new plan had been put in place: Just before they set sail they were informed that the masts at Cape Cod had suffered the same fate as those at Poldhu.

On their arrival, they commenced setting up a receiving station at Signal Hill, a rocky outcrop overlooking St Johns. An earth connection was made by burying large zinc plates. The receiving equipment was set out and the antenna wire was passed out of the window to a telegraph pole a short distance from the window that was used to anchor the balloon. A cable was sent to England to start sending transmissions from the 11th of December. All was ready and Marconi and his assistants waited in great expectation.

The transmitter at Poldhu was to send the letter "s" consisting of three dots. This was chosen for several reasons. The first was that the switching gear in the transmitter at Poldhu was unable to withstand the sending of longer dashes. The second was that a Morse inker or recorder would not be able to distinguish dashes as easily with the presence of atmospheric noise. This inker would be needed to provide proof that the transmissions were received. This would have been activated from the received signals using a coherer.

The day before the first transmissions were



The temporary fan antenna at Poldhu

to start, one of the kites used to support the antenna was successfully given a test flight. However, on the day of the first transmissions the wind started to strengthen. Even so, a balloon was raised rather than a kite to give a more stable antenna system. Signals were heard at intervals on a telephone receiver, but they were not strong enough to activate the inker. Finally, the rising wind caused a mooring line to break and the balloon was carried away.

The following day a kite was raised, carrying two 500-foot wires. This was used for about an hour before it too was blown away. A second kite was raised and this appeared to give better results. It was kept aloft for three hours and gave good signals. Marconi himself was listening to the signals which he later described as "unmistakably three sharp little clicks." Kemp also heard them, providing a second opinion, although it was not possible to use the inker.

Marconi had hoped to carry out further tests as the weather improved, because they still had no tangible evidence that the signals were received. Instead, the weather worsened. Accordingly, Marconi sent a cable to the managing Director, Major Flood-Page, detailing the success of the operation.

Reaction

While many agreed that the tests were a major achievement, there was considerable scepticism. Reports that appeared in the national daily papers in Britain shortly afterwards indicated that they thought Marconi had been mistaken when he received the three dots and that they were in fact either interference from another transmitter, or as a result of earth currents. The technical press were no less complimentary, saying that even if it were possible to transmit across the Atlantic, what use was it? Enormous antennas would be required, and transmitting speeds would be slow. Cables would be far more successful.

Despite the reaction in the press, commer-



Kemp, Marconi, and Paget in Newfoundland

cial interests were obviously concerned. On 16th December, the Anglo-American Telegraph Company sent Marconi a letter informing him of the monopoly they had been granted for telegraphic communication and threatening legal proceedings. Under this threat, Marconi had to discontinue his transmissions.

This was obviously a great blow to Marconi. He cancelled all further tests and took the advice, sending a cable to London. However, he obviously had plans to continue his tests either from the US or Canada. (Newfoundland was not part of Canada at this time.)

Marconi had to inform the press about these events, and this time opinion swung in his favor. The US and Canadian Governments were also very favorably disposed towards him. This bore real fruit when the Canadian Government offered Marconi a site free of charge at Glace Bay on Cape Breton Island. They also offered to contribute \$80,000 towards the station if Marconi's company kept the charges to within agreed limits.

Improvements

Marconi had to return to Ottawa to finalize the agreement. Along the way he decided to undertake some range tests as he steamed westwards away from Britain and Poldhu. By now, the transmitting equipment at Poldhu had been improved and both dots and dashes could be sent. By undertaking these tests Marconi could silence all doubts about the original tests.

Using a variety of different methods of signal detection Marconi was able to record signals up to distances of 700 miles by day and 1500 miles by night. Using self-restoring filings, signals could be detected at distances up to 2100 miles. As the antenna on the ship was only 150 feet high, whereas the one at Signal Hill for the first tests had been 500 feet high, this completely silenced Marconi's critics.

By the end of 1902, Marconi had installed his station at Glace Bay in Canada, and tests were started with the stations at Cape Cod and Poldhu. Soon messages began to be sent, both across the Atlantic and to ships in passage. In fact, this new development meant that for the first time, ships at sea could maintain contact with land even when they were over the horizon and many miles from the shore.

Final Days

Marconi went on to undertake many more projects and to develop wireless technology even further, but this was undoubtedly his major achievement. In later years, he became a senator for his native Italy and often represented his country abroad. Gradually, his health started to decline and on 20th July 1936, he died in Rome. On the day after his death all transmissions ceased for two minutes as a mark of respect: A fitting tribute to the man who is often called "The Father of Radio."

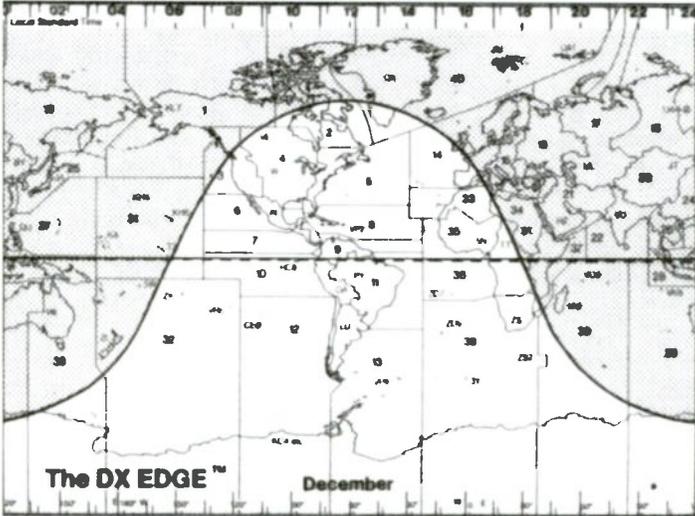
All historical photos have been reproduced by the kind permission of Marconi plc.

Marconi - Fortune's Favored Hand

By Bart Lee, KV6LEE, xWPE2DLT (blee@slksf.com)

Did He Really Do It?

By modern understandings of propagation, "... the transmission times and frequencies were, as later learned, the worst possible in view of propagation conditions on the North Atlantic path." - Professor G.H. Aitken in *Syntony and Spark - The Origins of Radio*.
Well, not necessarily. Here's a new look at why Marconi was able to get across the Atlantic on 820 kHz by spark...



The DX EDGE(tm) propagation mapping system for December.

Exactly Zero was the sunspot number for December 1901, according to NASA. During this year's 2000 solar season it has been as high as 310. But, Guglielmo Marconi knew nothing about sunspots and their effect on radio propagation in 1901, and at that time neither did anyone else.

We know now that a high sunspot number, with lots of ionizing radiation coming to the ionosphere, favors propagation of high frequency signals as high as 30 MHz and even higher. To the contrary, a low sunspot number means much less ionizing radiation, and lower frequency signals can skip around the Earth. This is so, because the ionosphere's absorption frequency is much lower. (So is the maximum usable frequency). Sunspots and the ionosphere were only beginning to be understood in the late 1920s,

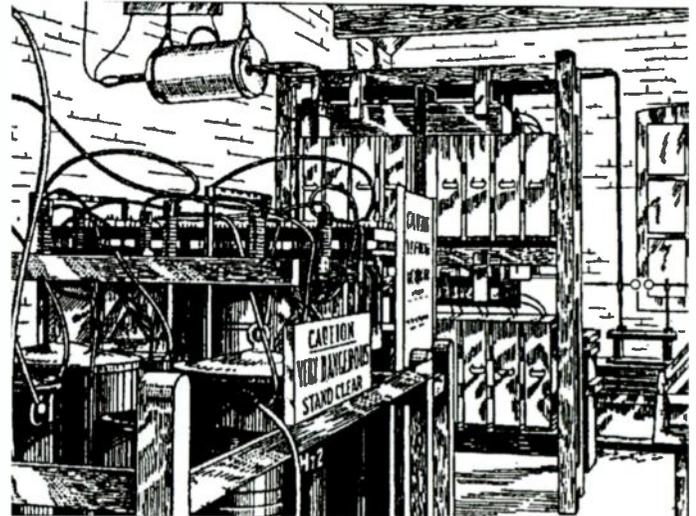
twenty years after Marconi's transatlantic triumph in Newfoundland. He was a lucky man, but surely there is an old Italian saying that "Fortune favors the prepared hand."

Marconi transmitted a spark signal on about 820 kHz at 13,000 to 25,000 watts, into a vertical fan antenna at Poldhu, Cornwall, UK. People talk about the harmonics of spark transmitters and speculate that perhaps Marconi heard a high frequency harmonic skipping across the Atlantic on his vertical kite antenna. The zero sunspot number makes this unlikely, because high frequencies would not be so propagating.

Moreover, there is no evidence that a spark transmitter produces harmonics the way an oscillating tube or transistor in a tank circuit does. The inductance and capacitance associated with a primitive spark transmitter act more like a slot-filter, albeit a broad one. Sometimes tight coupling of the antenna and transmitter inductances could produce a second, higher frequency. Marconi might thus have been sending out the famous "S" (three dots) on 820 kHz and also maybe 2 MHz (more or less).

In any event, the solar propagation conditions strongly favored skip propagation at lower, not higher, frequencies in December 1901. Moreover, December 12th is close to the winter solstice, so Marconi risked little thunderstorm noise at his high North latitude. The afternoon transmission times favored "grey-line" propagation as well, because Poldhu was already at the sunset terminator at the transmission times and Newfoundland was not far from it.

Marconi also used a sensitive mercury oxide detector and an earphone. Hearing a spark signal several thousand miles away on a galena detector was a later radioman's triumph, but well



Marconi's spark-transmitting room at Poldhu in Cornwall, from which wireless signals were first sent across the Atlantic. The spark gap is in front of the window on the right.

known to have happened in the years after Marconi's transatlantic success.

There is thus, on modern scientific understandings, as well as historical evidence, every reason to believe Marconi's three dots did indeed skip the Atlantic, and open the world to wireless, radio, TV and all of modern telecommunications.

See "Marconi's Transatlantic Triumph, a Skip into History," *Antique Wireless Association Review*

Sun Spot Archive

http://science.msfc.nasa.gov/ssl/pad/solar/greenwch/spot_num.txt

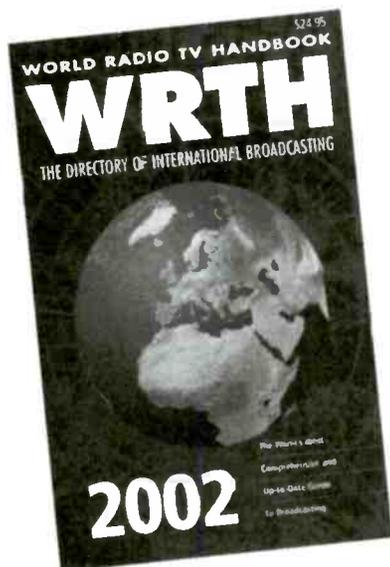
YEAR	MON	SSN	DEV
1749	1	58.0	24.1
1749	2	62.6	25.1
1749	3	70.0	26.6
1901	9	0.6	2.2
1901	10	3.7	5.9
1901	11	3.8	4.3
1901	12	0.0	1.0
1902	1	5.5	8.1
1902	2	0.0	1.0
1957	9	235.8	44.2
1957	10	253.8	31.3
1957	11	210.9	27.6
1957	12	239.4	63.0
2000	5	120.8	43.3
2000	6	124.9	25.0
2000	7	169.1	43.1



The antenna supported by the kite at Signal Hill, Newfoundland, used on December 12, 1901.

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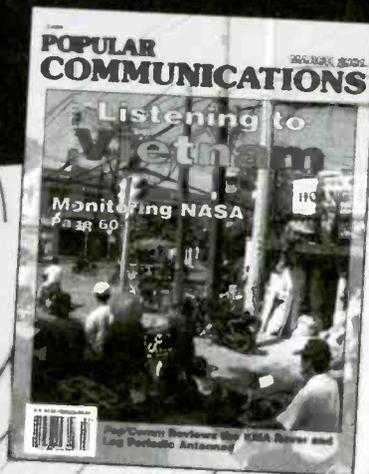
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SWLing from the West Coast

By Stewart McKenzie

Are you a shortwave listener (SWL) considering a trip to California? Maybe an East Coast DXer wondering what we hear out here on the left coast? Or maybe you're a local who recently acquired your first shortwave radio. For beginners and travelers, this article will cover some of what would be considered basics for listening and sample some of the powerhouse signals that can be heard fairly easily with the most modest of equipment – typically, what a traveler might bring with him or her on a trip or vacation.

Have Radio Will Travel

For traveling, I would recommend something that you can throw in a suitcase and still have room for the other essentials for the trip. In other words, a lightweight portable radio. Nothing fancy here, mind you. You don't need single side band (SSB) capability for the recommendations I plan to give. All stations will be in amplitude modulation (AM) mode and will be received with the humblest of receivers. You could of course bring a radio with all the bells and whistles with you, but do you want to stay cooped up in a motel room copying Morse code or SSB when the kids are antsy and Disneyland awaits? (I know some of you would.)

I do recommend that your radio have one option, and that is an external antenna jack, which will lead me to my next equipment recommendation. Can you guess? That's right – an external antenna of some sort. Nothing fancy here, either. We want it to fit in a suitcase, remember, so leave the Yagi at home. A length of insulated wire will make a random wire antenna, and its length is not that critical. Any length from 10-30 feet will do nicely and the wire should be easily coiled: It's got to fit in that suitcase.

Solder a connector that fits into your radio's antenna jack on one end and attach some type of clamp device such as an alligator clip or small battery jumper clamp to the other end. Make sure that your antenna clamp device is strong enough to hold up the length of your antenna. If the radio that you bring doesn't have the external antenna jack, bring the random wire antenna with you anyway. You can wrap the end of the insulated wire around the radio's telescopic antenna and it will work just fine. You don't need a metal-to-metal contact for it to work: the induction principle also works very nicely. If you ever want the metal-on-metal contact, turn the antenna around and attach the clamping device to the radio's antenna.

The next suggestion is for the consideration of manmade radio noise. If you have the choice, try to select a listening environment that is away from the inner city. If you book into a big city

downtown hotel, you probably will be surrounded with other downtown buildings that are higher than your present location. You'll also be surrounded with the corresponding computers, TVs, power transformers and other city stuff that makes radio listening so (un)enjoyable. I'm not suggesting that you need to book a room out in the rural countryside, although that wouldn't hurt. I'm suggesting that you find a room on the outskirts of a big city or in the suburbs. You will find lower radio noise and lower motel rates to boot.

The next suggestion is antenna height: The higher you get that external antenna the better. Although you could clip the antenna to the metal window frame and it would work very nicely, if you attach it to that tree outside your motel room or let it hang down from your outside balcony, your reception will be even more dramatic. Just make sure nobody will trip over your antenna. Watching your

radio fly off the nightstand while somebody is collapsing to the ground wrapped in your antenna will surely cure you of leaving the antenna in an unsafe area.

Be especially careful with your antenna near power lines both above and below if you happen to be staying in a multistory dwelling. Look down below before you throw that antenna over the balcony to avoid being fried.

When to Listen

This tip is universal, no matter what part of the world you come from. Night time is the right time for listening. You can use the daylight hours for hitting the vacation attractions or conducting your business day, and come back in the evening to listen in when the bands really open up. I am not saying that you cannot hear stations in the daytime, because you certainly can. Generally, stations above 13 MHz make it through in daylight if they are beamed to the western United States. But at night or at least a couple of hours before sunset, the stations below 15 MHz start coming in, getting progressively stronger as the night wears on.

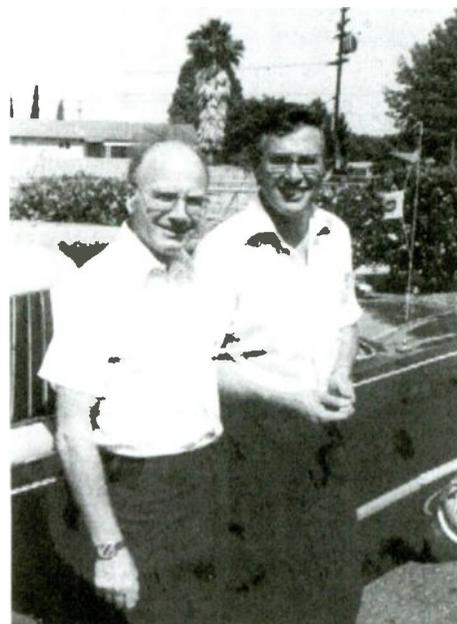
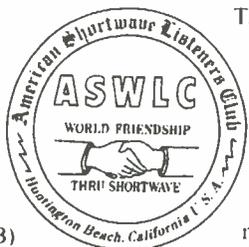
Where to Listen

Listening from the West Coast is quite a different experience from East Coast SWLing. Folks on the East Coast hear Europe okay but they have difficulty in hearing Asia. 'Tis just the reverse situation out here. Europe is difficult to hear directly, though it's heard okay via the various relay sites such as Ascension Island, Antigua, Netherlands Antilles, French Guiana, and the VOA Delano site. Africa is heard okay late at night and early in the morning. Rwanda is heard often throughout the day relaying the Voice of Germany.

Asian stations like NHK-Radio Japan can be heard directly from Japan. They use relays to get to the East Coast areas. Both Radio Korea and Radio Japan use Canada as a relay site, for example. When signals come across the Pacific Ocean, we can hear them pretty well out here whether they are shortwave stations or local broadcast stations. Likewise, our broadcast band Clear Channel stations boom into Australia, New Zealand and Japan.

Now, on to the listings. All stations listed here will be broadcasting predominantly in English and have good signals, so reception will not be a problem. This listing is what one can expect to hear about local sunset, 7pm PST (0300 UTC) and into the early evening ending about 11pm PST (0700 UTC). Because of changing atmospheric conditions, reception may be best on one frequency one day and on another and another the next day. You may also be able to hear some English broadcasts not specifically directed to the West Coast. You can check the *MT Shortwave Guide* for the latest broadcasts beamed to other target areas.

Starting with the North and coming over the Artic Polar Cap are the very strong signals from the **Voice of Russia** world services. This is what remains of the communist era Radio Moscow services, and even though Russia has moved toward democracy in the last decade, their newscasts are still slanted towards their likings. They do have some colorful programs, though, and can be heard starting at 5pm PST (0200 UTC) on 17595 via Petropavlovsk in the North Pacific region of Rus-



The author with Radio Nederland's Tom Meyer at a SCADS meeting in 1979.

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Stewart McKenzie's amateur radio QSL card.

sia. Also try 11825, 9725, and 7180 kHz.

Continuing along the Great Circle route is Japan's entry into international broadcasting, Nippon Hoso Kyokai (NHK), commonly known as **Radio Japan**, starting at 7pm (0300 UTC) on 17825 and 9pm (0500 UTC) on 6110 via the Canadian relay site and 13630 kHz. Radio Japan features news focusing on Japan and the East Pacific, Japanese music and cultural programs. **China Radio International (CRI)** starts at 7pm (0300 UTC) on 9690 kHz via a relay site in Spain, with news and cultural programs about, you guessed it, China. It is interesting to get their views on the world through their eyes. And not to be outdone is the Republic of China's **Radio Taipei International (RTI)** which starts at 7pm (0300 UTC) on 5950 kHz and 9680 kHz via the WYFR relay site in Florida. Now you can hear two different views from two different Chinas.

Traveling southward we come to Australia and its outlet known as **Radio Australia** operating on 17795 kHz at 2pm PST (2200 UTC). The frequency is good up to 6pm PST (0200 UTC). Another good frequency is 9660 kHz from 10pm to 12 midnight PST (0800 UTC). Our next stop is a place that we would all like to visit in person, the **Solomon Islands** which can be heard on the frequency of 5020 kHz at 1130am (1930 UTC) to around 0330am PST (1100 UTC) in Pidgin and English with some excellent Pacific island music.

Next we swing over to South America and to the country of Ecuador and its station, **HCJB**. Located high up in the Andes near Quito, you can hear beautiful Andes music through out the day on 9745 kHz; also try 5115 and 11755 kHz. Our last stop is Mexico and its station, **Radio Mexico International** on 9705 and 11770 at 8pm (0400 UTC) and 2pm (2200 UTC) in English and Spanish.

As you can see, there is much to be heard on the international broadcast bands throughout the Pacific Rim. Turn to the Shortwave Guide on p.42 and look for frequencies targeted to "pa," "na" or "am" for the best reception. Tune in often and get the latest news, sports games, popular music and language learning programs. Good Listening from the West Coast of the US!

Reporting – A Mutual Responsibility

Reception Reports and QSLs

Accurate reports on reception conditions are invaluable to the radio stations concerned, helping staff to gain a complete picture of station coverage and reception quality of various transmissions. To encourage reporting, most stations provide verification cards (QSLs) in grateful acknowledgement of accurate and useful reports

from their listeners. Thus the radio hobbyist – the principal collector of QSL cards – fulfills his/her desire by providing, at the same time, some real assistance to the broadcaster. Both the stations and the DX fraternity should be equally interested in cooperating to develop the best possible reporting methods.

One should recognize that there are two general categories of those who listen to radio broadcasts. One of them makes up more than 99.9% of a station's audience yet has no knowledge of nor interest in the DXing hobby. This large group listens avidly to the program content for pleasure and entertainment, to better comprehend world affairs, to learn foreign languages, or for like reasons. This group numbers over 800+ million. A few of them who have heard the term may call themselves *SWLs* – shortwave listeners.

However, the true *SWL* hobbyist is generally one who has developed a more specialized or technical interest. He or she may have joined a radio club or two and/or subscribed to this magazine in pursuit of further knowledge. The *DXer* may be defined as a listener who is chiefly concerned with the challenges involved in hearing and verifying the distant and rare (i.e., infrequently heard) stations. The *SWL* who has sent his/her first reception reports and received his/her first few QSLs might be considered a novice *DXer* – if we're not too strict. With that clarification, then, when we speak of a *DXer*, we include the *SWL* who enjoys collecting QSLs.

Together they comprise the very small second group of those who listen to radio broadcasts. (The medium wave *DXer* is also included). Thus we note a process of evolution, from a *casual listener*, through the *hobby listener*, to the *DXer*, and one key to this full development must be the reception report.

The Broadcaster's View

Broadcasting stations all have an avowed purpose: to reach a certain particular audience. The smallest of stations may transmit with low power, yet it may be sufficient to reach an entire audience within the confines of one region, one small island, or even one community. At the opposite extreme are the powerhouse, international behemoths with many separate transmissions, each intended for a separate audience, even if the audience includes full world coverage.

Transmissions are selectively beamed, or projected, to what is termed the "target area" – the intended audience. As might be expected, reception is generally best within the target area, and stations are particularly interested in obtaining reception reports from their intended audience. While smaller stations may respond *only* to reports from their target region, many others will usually acknowledge accurate and useful reports, even though the listener may not reside therein. Remember, when they do this, they are doing so in the interest of good-will and as a distinct favor to you – not because it is of much value to their technical staff.

In the eyes of those to whom you send your reports, only reports which provide useful and timely data for the planning and judgment of the transmissions are of any real significance. Whether the reception quality is good or bad and whether you like the program content or not, what they



The author's shack, circa 1960. Equipment includes three Hallicrafters receivers and other 1940s and '50s era equipment. He says the Kenwood R500 and the Grundig Satellit 650 have replaced everything except for the antenna tuning unit!

want are clear, accurate reports of reception conditions. Objective technical reception reports are always appreciated.

Your success at obtaining verifications (QSLs) depends to a great extent on your proficiency in submitting intelligent, informative, properly prepared reports. This may well be your only contact with the station, so make it worth both their time and yours. And, above all, bear in mind that your reception and that of the entire DX fraternity depends on how well we all maintain our good relationship with station personnel.

About the author:

Stewart McKenzie WDX6AA is General Manger of the American Shortwave Listeners Club. For more information on West Coast SWLing and for loggings of reception, check the American Shortwave Listeners Club – ASWLC at <http://www.ocnow.com/community/groups/shortwaveradio>, and the Southern California Area DxeRS – SCADS at: <http://www.ocnow.com/community/groups/radiocommunications>. When on the websites, please sign the Guest Books and leave your comments for a better hobby of shortwave radio listening. Or, you may write the ASWLC at 16182 Ballad Lane, Huntington Beach, CA 92649-2272.

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Kiwa offers performance upgrades to improve the performance of the following receivers:

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Sony ICF2010
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www.kiwa.com (full catalog)

Department Store Scanning

By Bob Eisner

The following is a list of common frequencies and tones which can be found at various Shopping Malls across the country. It was compiled from frequency reports on both coasts of the country and also Hawaii.

This list can be very handy in identifying the various businesses at shopping malls across the country. Some of these businesses such as Hechts (east coast) and Mervyns (west coast) are regional.

Please note that several businesses such as Express, Structure and Limited all use the Motorola Spirit GT Two-Way Radios. These look just like FRS radios and even have the same call button feature as the Motorola FRS radios.

The common frequencies for the Motorola Spirit GT are as follows:

1	464.5000	Brown
2	464.5500	Yellow
3	467.7625	J
4	467.8125	K
5	467.8500	Silver Star
6	467.8750	Gold Star
7	467.9000	Red Star
8	467.9250	Blue Star



Banana Republic

Common frequency and tone 151.8350 PL 74.4

Confirmed frequencies and tones:		
151.8350	PL 74.4	Operations
151.9550	DPL 172	Operations
154.6000	DPL 532	Operations
154.6000	DPL 624	Operations

Bloomingdales

Common frequencies and tones 467.8250 DPL 606 and 467.9250 DPL 606

Confirmed frequencies and tones:		
467.8250	DPL 606	Security
467.9250	DPL 606	Security

Costco

Common frequency and tone 154.6000 PL 82.5

Confirmed frequencies and tones:		
151.6250	NONE	Operations
154.5700	PL 67.0	Operations
154.5700	PL 156.7	Operations
154.6000	NONE	Operations
154.6000	PL 67.0	Operations
154.6000	PL 82.5	Operations
154.6000	PL 179.9	Operations
464.5000	PL 179.9	Operations

Crate & Barrel

Common frequencies and tones 467.7625 PL 77.0 and 467.8750 PL 77.0

Confirmed frequencies and tones:		
467.7625	PL 77.0	Operations
467.8750	PL 77.0	Operations

Dave and Busters

Common frequencies and tones 469.1125 DPL 413 and 469.5000 DPL 506

Confirmed frequencies and tones:		
469.1125	DPL 413	Operations
469.5000	DPL 506	Security

Express

Frequencies to search

http://commerce.motorola.com/consumer/QWhtml/spirit_frequency.html

Confirmed frequencies and tones:

154.5400	PL 118.8	Operations
464.5500	PL 67.0	Operations
464.5500	PL 71.9	Operations
464.5500	PL 74.4	Operations
467.7625	PL 67.0	Operations
467.8750	PL 82.5	Operations
467.9000	PL 67.0	Operations

Foot Locker

Common frequency and tone 154.5700 PL 67.0

Confirmed frequencies and tones:		
154.5700	PL 67.0	Operations

GAP

Common frequencies 151.8050, 154.5150, 151.5400, 154.5700 and 154.6000

Common PL tone 74.4

Common DPL tones 172, 311 and 624

Confirmed frequencies and tones:		
151.6250	PL 74.4	Operations
151.8050	PL 74.4	Operations
151.8050	DPL 172	Operations
151.8050	DPL 311	Operations
151.9550	PL 74.4	Operations
154.5150	PL 74.4	Operations
154.5150	DPL 172	Operations
154.5400	PL 74.4	Operations
154.5400	DPL 172	Operations
154.5400	DPL 311	Operations
154.5700	PL 74.4	Operations
154.6000	DPL 624	Operations

Hechts

Common frequency and tone 464.5000 DPL 612 and 464.5500 DPL 612

Confirmed frequencies and tones:		
464.5000	DPL 612	Security
464.5500	DPL 612	Security

JC Penneys

Common frequencies 154.6000, 466.2625, 466.9625 & 467.8125

Common PL tone 85.4		
Confirmed frequencies and tones:		
154.6000	PL 85.4	Security
463.6375/468.6375	PL 179.9	Security (San Bruno, CA only)
463.7250/468.7250	PL 85.4	Security
464.7375	PL 179.9	Security (San Bruno, CA only)
466.2625	PL 85.4	Security
466.9625	PL 85.4	Security
467.8125	PL 85.4	Security

Limited

Frequencies to search

http://commerce.motorola.com/consumer/QWhtml/spirit_frequency.html

Confirmed frequencies and tones:		
464.5500	PL 67.0	Operations
462.6250	PL 233.6	Operations (this is actually GMRS Ch. 4)

Lord and Taylor

Confirmed frequencies and tones:		
467.1375	DPL 026	Security

Macy's East

Common frequencies 464.1000, 464.1750 and 464.2750

Common PL tone 203.5		
Confirmed frequencies and tones:		
464.1000/469.1000	PL 203.5	Security
464.1750/469.1750	PL 203.5	Security
464.2750/469.2750	PL 203.5	Security

Macy's West

Common frequencies 461.2875, 461.7625, 463.2625, 464.2125 and 464.7125

Common DPL tones 251, 261 and 265		
Confirmed frequencies and tones:		
461.0375/466.0375	DPL 265	Security

461.0875/466.0875	DPL 251	Security
461.1125/466.1125	DPL 223	Operations
461.2375/466.2375	DPL 251	Security
461.2625/466.2625	DPL 251	Security
461.2875/466.2875	DPL 251	Security
461.2875/466.2875	DPL 261	Security
461.2875/466.2875	DPL 265	Security
461.7625/466.7625	DPL 251	Security
463.2625	DPL 251	Security
463.2625/468.2625	DPL 251	Security
463.2625/468.2625	DPL 265	Security
463.2875	DPL 143	Security
463.4875/468.4875	DPL 251	Security
463.4875/468.4875	DPL 265	Security
463.6375/468.6375	DPL 251	Security
463.7625/468.7625	DPL 251	Security
463.9875/468.9875	DPL 251	Security
464.1375/469.1375	DPL 251	Security
464.2125/469.2125	DPL 143	Security
464.2125/469.2125	DPL 251	Security
464.5500	PL 74.4	Operations
464.7125/469.7125	DPL 251	Security
464.7125/469.7125	DPL 261	Security
464.7375/469.7375	DPL 251	Security
464.8625/469.8625	DPL 251	Security
464.8250/469.8250	PL 203.5	Security
467.9250	PL 77.0	Operations

Mervyns

Common frequencies and tones 464.5000 DPL 043 and 464.5500 DPL 051

Confirmed frequencies and tones:		
464.5000	DPL 043	Operations
464.5500	DPL 051	Operations

Neiman Marcus

Common frequency and tone 464.5750 PL 127.3

Confirmed frequencies and tones:		
464.5750	PL 127.3	Security

Niketown

Common frequency and tone 461.1375 DPL 065

Confirmed frequencies and tones:		
461.1375	DPL 065	Operations & Security

Nordstrom

Common frequencies 460.9125, 463.8375, 464.0875 and 464.6125

Common PL tone 146.2		
Confirmed frequencies and tones:		
452.0000/457.0000	DPL 606	Security (San Francisco, CA only)
460.9125	PL 146.2	Security
460.9125/465.9125	PL 146.2	Security
460.9125	PL 173.8	Maintenance
461.8500/466.8500	PL 151.4	Security (Glendale, CA only)
463.3750/468.3750	PL 110.9	Security (San Francisco, CA only)
463.5625/468.5625	DPL 131	Security
463.8375	PL 136.5	Security
463.8375/468.8375	DPL 146.2	Security
463.8375	PL 146.2	Maintenance
463.8375	PL 173.8	Security
464.0875	PL 146.2	Security
464.0875/469.0875	PL 146.2	Security
464.0875/469.0875	PL 156.7	Security
464.2625	PL 146.2	Volet Parking
464.2625/469.2625	PL 146.2	Security
464.5000	DPL 346	Engineering
464.6125/469.6125	PL 146.2	Security
464.6125	PL 146.2	Maintenance
468.4375	PL 146.2	Maintenance
469.0875	PL 146.2	Security

Old Navy Store

Common frequency and tone 151.9550 PL 74.4

Confirmed frequencies and tones:		
151.6250	PL 74.4	Operations
151.7750	PL 77.0	Operations

continued on page 81



GROVE



ICOM

PCR100	RCV 44	\$249.95
PCR1000	RCV 45	\$349.95
R75	RCV 32	\$574.95
R8500	RCV 14	\$1469.95*

AOR

AR-5000 Plus 3	RCV 42P	\$2139.95*
AR-7030 Plus	RCV 17	\$1499.95*

SANGEAN

ATS-505P	RCV 7	\$129.95
ATS-909	RCV8	\$239.95

WINRADIO

WR-1550 (External)	RCV 47-E	\$549.95
WR-1550 (Internal)	RCV 47-I	\$499.95
WR-3150 (External)	RCV 48-E	\$1849.95
WR-3150 (Internal)	RCV 48-I	\$1849.95
WR-3500 (External)	RCV 49-E	\$2395.95
WR-3500 (Internal)	RCV 49-I	\$2395.95
WR-3700 (External)	RCV 50-E	\$2895.95
WR-3700 (Internal)	RCV 50-I	\$2895.95

GRUNDIG

Satellit 800	RCV 33	\$499.95
Yacht Boy 400 PE	RCV 22	\$149.95

DRAKE

R8-B	RCV 3	\$1349.00
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JAPAN RADIO COMPANY

NRD-545	RCV 21	\$1799.95
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GE

SUPERADIO III	RCV 5	\$59.95
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YAESU

VR5000	RCV5I	\$689.95
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Shipping/Handling Charges

Total Order	Shipping Charges
\$1-\$99	\$5.95
\$100-\$399	\$7.95
\$400-\$899	\$11.95
\$900-\$1499	\$15.95
\$1500-\$1999	\$19.95
\$2000-\$2499	\$23.95
\$2500+	\$27.95

*price includes shipping within the US
Prices subject to change without notice.

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Active Duck	ANT 36	\$39.95
AOR SA7000 Super-wide receiving	ANT 39	\$199.95
AOR DA3000 Wideband Discone	ANT 11	\$129.00
AOR MA5000 Wideband Mobile Whip	ANT 12	\$99.00
Austin Condor Flex Antenna	ANT 14	\$29.95
Create CLP51302N Log-Periodic Antenna	ANT 17	\$299.95
Grove Omni II VHF/UHF	ANT 5	\$29.95*
Grove Scanner Beam VHF/UHF	ANT 1	\$74.95*
Grove Skywire	ANT 2	\$29.95
Grove Universal Telescoping Whip Antenna 6"-16"	ANT 6	\$19.95
H800 Skymatch Active	ANT 15	\$129.95*
Max System 800MHz Antenna	ANT 22	\$29.95
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Optoelectronics Racing "Stub", 2.5"	ANT 18	\$15.95
Range Extending Mobile Mag Mount	ANT 3	\$24.95
Select-A-Tenna	ANT 21	\$59.95
Scantenna VHF/UHF	ANT 7	\$54.95*
Stealth Mobile Antenna	ANT 30	\$34.95
Super Select-A-Tenna	ANT 40	\$189.95
Wideband Discone	ANT 9	\$99.95*
WINRADIO AX-31B	ANT 4	\$119.95

ACCESSORIES

ICOM RECEIVERS

UT-106 DSP upgrade kit	ACC 16	\$139.95
Remote control software for R75	SFT 24	\$79.95
OPC-131 DC Power Cord	DCC 4	\$11.95

AOR RECEIVERS

CTCSS for AR5000 & AR5000+3	ACC 96	\$99.00
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WINRADIO RECEIVERS

FSK decoder	DEC 1	\$349.95
Portable power supply	PWR 5	\$189.95
Digital Suite software	SFT 15	\$85.00
Database Manager software	SFT 16	\$44.95
Trunking Software	SFT 23	\$89.95
USB Adaptor for External Models	ACC 2	\$49.95
Telephone Interface for External Models	ACC 6	\$1995.00
PCMCIA PC Card	ACC 28	\$89.95
Audio Cable	CBL 3	\$10.00

DRAKE RECEIVERS

VHF converter	ACC 43	\$249.00
		+ \$65 installation
External Speaker	SPK 2	\$48.95

JRC RECEIVERS

Wide-band converter (less cellular)	ACC 11	\$349.95
High stability crystal	ACC 12	\$99.95
NVA-319 External Speaker	SPK 6	\$210.00

YAESU RECEIVERS

DSP1 Digital Signal Processor	ACC 1	\$119.00
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MISCELLANEOUS

Scantcat Gold for Windows	SFT 2W	\$99.95
Scantcat Gold for Windows SE Upgrade	SFT 2SE	\$59.95
Speco Speaker	SPK 1	\$19.95
GRE Super Amplifier	PRE 1	\$49.95
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Grove FTR-100 Scanner Filter 90-174MHZ	FTR 100	\$49.95
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PAR VHF Intermod Filter 158MHz	FTR1 58DS	\$69.95
PAR VHF Intermod Filter 462MHz	FTR4 62DS	\$69.95
FM Trap Filter 88-108MHZ	FTR-FMDS	\$69.95

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Monitoring Times

Celebrates 20 Years

By Rachel Baughn, Editor

Monitoring Times has just completed 20 years of publication. That may not sound like much, compared to venerable shortwave broadcasting stations and shortwave clubs who have already passed the half-century mark. But, for a full-frequency-coverage commercial periodical – at least in the U.S. – *Monitoring Times* was the first.

MT started life in January 1982 as a small bimonthly newspaper, combining questions and answers and articles by Bob Grove, a smattering of short articles and projects by readers, and the Grove Enterprises "catalog." Although today's slick magazine bears little resemblance to that initial eight-page flyer, its philosophy has never wavered from Bob Grove's promise in the very first issue:



Space Shuttle Communications Monitoring



From The Editor,



...Covering the vast swath of radio spectrum from the lowest to the highest frequency; Monitoring Times will present articles of unusual interest with objectivity and authority ... For the first time, active listeners to the radio spectrum will be treated seriously; not simply as stepchildren of some other vogue hobby."

My own beginning with *Monitoring Times* was in 1983, when Grove bought its first computers and brought production in-house. My job was to type the articles and paste up the pages by hand for publication.

Though *MT* certainly has bragging rights to a number of ground-breaking stories, we thought

we'd do something different for this anniversary and look back at some of the columns and columnists which no longer appear in the pages of *MT* but are an important part of our history. See how many of these names and columns you can remember!

The Early Years

Although Bob Grove's own interest has always been in communications, he quickly brought in knowledgeable writers who covered the field of broadcasting: Hank Bennett W2PNA, Ed Noll, Tom Williamson, Roger Peterson, and "Ken Wood" (a pseudonym probably belonging to Gerry Dexter).

Norm Schrein popped in and out with a variety of scanning columns – *Scanning with Norm Schrein*, *Tune in Canada*, and *Worldwide Scanning*. Gilles Thibodeau

also wrote a *Canada Scan* column briefly. James R. Hay (also a Canadian) wrote the *High Seas Radio* column, which had a 13-year run. John Santosuosso covered the *Pirate Radio* scene (which later became *Outer Limits*), and the mysterious Havana Moon covered spy number broadcasts in his *Los Numeros* column. Remember *Utility Intrigue* by Don Schimmel? There was even a *Club Corner* column authored by Paul Swearingen and dedicated to club profiles and activities.

Satellites had an early presence in *MT*. *Signals from Space* – Larry Van Horn's debut into *MT* – eventually led to the publication of his book, *Communications Satellites. Satellite TV* by Ken Reitz was also introduced within the first five years. (It had a short-lived come-back as *The Launching Pad* in recent years.)

You might also find it surprising to realize how long computers have been a part of the magazine. The *Bits* column by Mike Edelson and *Computer Corner* by C.W. Ellis appeared long before other digital modes got their own pages.

Ike Kerschner was the first editor of the *Getting Started* column – a name we've recently restored. A variety of hands-on projects and reviews appeared under the titles of *Technical Topics*, *Helpful Hints*, and *Behind the Dials*, authored by Bob Grove or other contributors.

Merger Brings New Strength

In June of 1986, *Monitoring Times* merged with Larry Miller's shortwave broadcast publication, *International Radio*, and was initially presented as a tabloid with a color cover. Larry Miller

soon took the helm as managing editor. *MT* assumed its current magazine format in 1988. During this time of transition, several new authors and columns were introduced; some lasted only a few months, some for years, and others (like the *Shortwave Guide* section) are still going strong. Utilities were covered briefly in excerpts from *SPEEDX*, edited by J. Speed Gray. Then *Utility World* got its start under Larry Van Horn's authorship. *FAX Facts* by G.P. Mengell covered reception of HF weather facsimile on a hobby level. *Reading RTTY* started without a

columnist, but Jack Albert became editor until it was discontinued. *Technical Topics* also acquired a regular columnist in Terry Staudt.

Domestic Broadcasting became *Making Waves*, then *AM DXing*, and finally *American Bandscan*. Paul Swearingen was its first editor. Larry Miller took a crack at it for a while, then Karl Zuk was its editor for many years. Joe Eisenberg followed Karl until today's columnist, Doug Smith. Bob Kay wrote the general scanning column which was first called *Scanning*, then *Scanning the Nation*, until the *Scanning Report* title stuck. Richard Barnett wrote the column for several years until he recently retired and Robert Wyman took the helm. *Pirate Radio* became *Outer Limits*, edited by John Santosuosso and Scott McClellan until Santosuosso retired and *MT* snagged George Zeller to head it up.

The *Federal File* got its start with Dave Jones,



EXPERIMENTER'S



WORKSHOP

then some fellow named "Rod Pearson" took over, then Steve Douglass, and John Fulford, until it reverted to Rod Pearson again under his real name, I mean Larry Van Horn! *Getting Started* moved from Ike Kerschner to Kenneth Vito Zichi. Then it became *Uncle Skip's Corner* with T.J. Skip Arey, and later changed its name to *Beginner's Corner*. *On the Ham Bands* began with Mike Mitchell; then Ike Kerschner moved to the column until his recent retirement. Ike also produced the *Propagation Report* until Jacques d'Avignon took it over with his familiar grids. Rob Gerardi produced *DX Ham Tips* for a while to supplement the ham column.

Bob Evans was the only columnist for *Digital Digest* until retiring in 1999. Joe Woodlock started the *Below 500 kHz* column, and Kevin Carey has had the column since Joe passed away. Jock Elliott has always written about the same basic subject, but the names keep changing. First it was *Personal Communications*, then ... *And More* (paired with *On the Ham Bands*...), and now *Easy Access*. Dan Veeneman started with *MT* writing the *PCS Front Line* column; but when readers couldn't get excited about new radio technologies they weren't allowed to listen to, we switched him to the more popular *Tracking the Trunks* column.

The *Scanner Equipment* column was started with Larry Wiland as editor/reviewer before Bob Parnass took it on in 1995.

The *Shortwave Guide* has always been at the core of *Monitoring Times* since the merger with Larry Miller's publication. The frequency coordinator for the *Shortwave Guide* – an enormous job – was first Larry Miller himself, then Greg Jordan, and since then, Gayle Van Horn. Frequency monitors who have helped over the years have been Gunner Danneels, Jim Young, Joe Hanlon, Rich Foerster, Bill Brinkley, Richard Keen, B.W. Battin, David Datko, Jack Hubby, Loyd Van Horn, Dan Roberts, and Mark Fine. Before long, *MT* added programming details to the mix. Kannon Shanmugam was the first program manager who established the format. Following his high standards were Jim Frimmel, and

"Los Numeros"

32444 69213 88816 52196 63811 94216

Havana Moon



now John Figliozzi. Supporting team members were Dale Vanderpoel and John Carson – and of course the *MT* readers!

Experimenters Workshop was a favorite project section for many years. It was first authored by Bob Grove from ideas and questions sent in by readers. Rich Arland edited it for a time, and then Bill Cheek evolved the column into the new era of chips and computer boards. We retired *Experimenters Workshop* when Bill was no longer able to write it.

A few departments had only one author for the life of the column: We've already mentioned James Hay's *High Seas*, Larry Van Horn's *Signals from Space*, and Don Schimmel's *Utility Intrigue*. But of course only Doug DeMaw could produce *DeMaw's Workbench*, and only Larry Magne could perform his *Magne Tests*... short-wave receiver reviews. The *K.I.S.* column was Rich Arland's baby.

This category also includes several long-running columns which are still going strong: Clem Small has been writing the *Antenna Topics* column since 1984, Jean Baker has edited *Plane Talk* since 1985, and Gayle Van Horn has been producing the *Broadcast Logs* and *QSL Corner* since 1988.

Acknowledgments and Disclaimers

It is with gratitude and pride that we acknowledge the contributions made by Joe Woodlock, Bill Godbey (true identity of Havana Moon), Doug DeMaw and Bill Cheek – four staff members who passed away while still going strong in their love of the hobby. Each had a major impact in their widely divergent areas of expertise. We also remember the superb work of John Bailey, art director for *Monitoring Times* and *Satellite Times* until his untimely death.

Monitoring Times owes its existence to former editors Bob Grove and Larry Miller, who coached their writing staff well, wrote many of the articles themselves and set *MT's* high standards. We also acknowledge the contributions and dedication of our staff members who have met deadlines in spite of grave illness, deaths in the

family, power outages, blizzards – you name it! We mention also some folks in *MT's* history who didn't write for it but left their stamp nevertheless: Elsa Kerschner, typist; Robin Miller, cover designs; Beverly Berrong and Belinda McDonald, art directors.

Bob Grove's ethics, energy, and enjoyment of radio remain the guiding hand behind the magazine. His accessibility and responsiveness to readers is legendary. The *Ask Bob* column is the hands-down favorite in every survey. When it comes to making the magazine what it is today, one other person deserves special mention: Larry Van Horn has been writing for *Monitoring Times* since 1983 and has never missed a deadline. The only person who can equal his passion for accuracy is *Global Forum* columnist Glenn Hauser. Larry has authored many feature articles along with columns on utility, federal, military, satellite communications and more for *Monitoring Times*. The books to his credit are beginning to add up as well!

I ask your forgiveness if I have missed anyone in this informal accounting of past writers. I didn't attempt to recognize free-lance writers, nor all of the new staff added in the past five years, although they're certainly among the very best.

I do want to single out those on our current roster who have been writing or working nonstop for *Monitoring Times* for ten years or more: They form the foundation of the magazine you are holding today. Here they are in order of longevity: Bob and Judy Grove, Rachel Baughn, Larry Van Horn, Clem Small, Jean Baker, Glenn Hauser, Ken Reitz, Skip Arey, Gayle Van Horn, Beth Leinbach (advertising), Kevin Carey, John Catalano – and, George Zeller, you're almost there!

PIRATE RADIO



A standing ovation, please!



TVRO Update: MPEGII & HDTV Converter

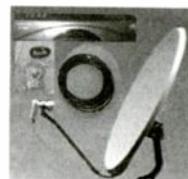
Video services using the MPEGII Digital Broadcast Video (DVB) standard continue to proliferate on the C and Ku-bands available to North American viewers. Interestingly, throughout the last five years most of these services continue to be fed in the clear, or Free-to-Air (FTA). The span of broadcast satellites receivable from much of the U.S. contains hundreds of such FTA signals. There are a number of excellent receivers on the market which can tune in these signals. Last year I reviewed smallear.com's ST6600, so in this issue I'll take a closer look at its replacement, the ST7700.

◆ No Longer a Slave

Since their introduction to the satellite TV hobby five years ago, MPEGII DVB FTA receivers have seen quite a few changes, but they're not obvious from the outside. Looking remarkably like their DBS counterparts, the big differences are in the signal processing software and, in the case of the ST7700, the other differences are on the rear panel. For years MPEGII receivers had to be used in a "slave" configuration, that is, the unit was tied to an analog receiver which was used to drive the dish and switch polarity. But, the ST7700 has outputs on the back to power a dish mover and polarotor. This addition has really improved the versatility of the receiver, making it possible to actually have a complete MPEGII system without the use of an analog receiver.

Sold with this receiver is the new DVB Express "Smart Eye" Ku LNBF, which locks on to an MPEGII signal almost instantly and lights a bright LED on the LNBF case to indicate acquisition of a signal. This is particularly useful when trying to align a system on a satellite which has

no analog signals and/or if you are using only a digital receiver. This takes the guesswork out of finding the satellite. Once the LED lights you know you're at least in the beam of the satellite; from there it's a matter of adjustment to peak the system on that bird.



The complete package from Smallear - no analog receiver required.

Among the other amenities of the ST7700 receiver is that it converts MPEGII PAL signals (transmissions mainly from England) into our NTSC standard for display on any TV through a channel 3/4 modulator which replaces the old UHF frequency agile modulator in the earlier model.

The main difference between analog and MPEGII receivers is that MPEGII uses compressed video, which means that 10 or more video channels can be transmitted in the space of a single analog channel. The channels are transmitted together in what's called a bouquet. To tune the channels in the bouquet, the user has to enter the correct frequency and symbol rate in the receiver. This is where using an MPEGII receiver separates the hobbyists from the DBS crowd. It's a little frustrating, but once you've done it a few times it becomes routine and the reward is watching programming available nowhere else.

◆ More Interesting Options

As with most MPEGII receivers, the ST7700 also features a switch from 4:3 to 16:9 aspect ratio for display on modern HDTV sets as well as "S" VHS video output to those same sets for superior pictures. There's a built-in signal quality display, which really helps nail down the dish peaking. It also features a DiSeqC control which allows operation of up to four different dishes via a DiSeqC switch.

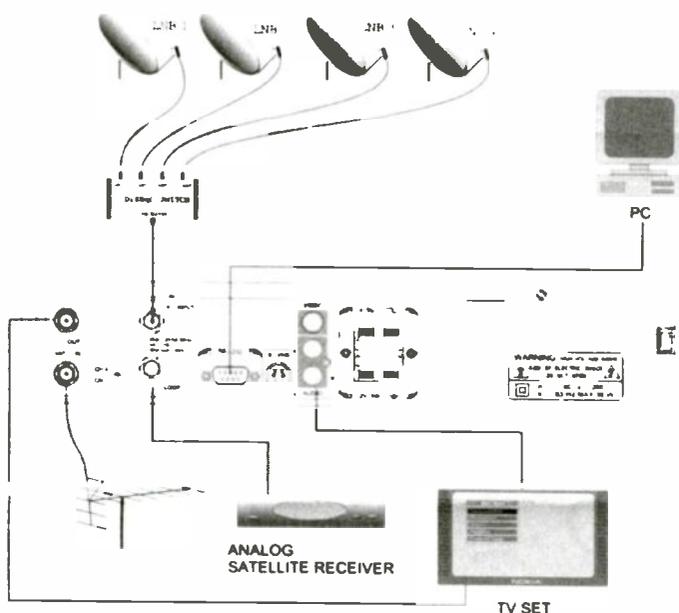
At first this might not seem like much of a feature, but it has some interesting applications. If you are unfortunate enough to live in an area which forbids the installation of dishes larger than 1 meter, there's still room to enjoy your satellite TV hobby. There's no prohibition against the number of 1 meter dishes you can have, and with a DiSeqC control you can feed the output of four different dishes to one receiver (see diagram).

For instance, you can have one dish pointed at Telstar 5 with a Ku-band LNBF to pick up the many international channels in MPEGII FTA; another dish set to GE 1 Ku-band to pick up the MPEGII NBC feeds; and one aimed at Telstar 6 Ku for the MPEGII CBS feeds. The switching is done through the receiver using your remote control. It couldn't be easier. And, since the dishes don't actually move, it's more like flipping through the channels on a DBS system with no time lag.

Here are a few other goodies on the ST7700. There's an event timer which allows you to set the receiver to tune a particular channel on a particular satellite for recording on your VCR. You can set the timer on up to eight events. There's also sleep timer which shuts the system off after a set time. A switch from TV to Radio services turns the on-screen guide from TV channels to Radio channels. Now by simply scrolling through the list you can click on the service you want to hear.

◆ How to Find MPEGII Channels

There are quite a few sources for finding MPEGII channels with information on their location and reception parameters. The two best are



Making connections on the ST7700. Now featuring polarity controls and dish drive connections, DiSeqC switch control, S-VHS out, and channel 3/4 modulator this receiver also converts MPEGII PAL format (courtesy smallear.com)



Motorola's HDD200 HDTV decoder brings high definition viewing to C-band. You'll need a pricey HDTV compatible TV set to watch and channel numbers are limited (courtesy Motorola)

eastern horizon far enough, you can see dozens of European and South American channels never seen on American satellites or cable systems.

Of all the additions to your current satellite TV system, adding an MPEGII receiver gives you the most viewing for the buck. And, the ST7700 is the most versatile for the price on the market.

❖ MPEGII Viewing in the Field

There are quite a few MPEGII receivers on the market and I've heard good things from MT readers who have bought various models and reported in. Among the good reports are the Astrotel DMT 2000 and the Pansat 2100A.

I used the ST6600 for a full year and enjoyed daily MPEGII programming without a hitch. I've used the ST7700 for several weeks, as of this writing, and notice improved audio and particularly improved PAL conversion. I watch the BBC national newsfeed from London on Panamsat 9 every afternoon at 1 pm, which is fed in PAL, and it's never been better. Also appreciated are the faster search and load times, expanded channel capacity (2,400 channel memory), and the earlier mentioned improvements. If you have added an MPEGII receiver to your system let me know what your experiences are and what receiver you're using.

❖ Motorola's HDTV SideCar

Several years ago General Instrument (GI) brought out their 4DTV digital/analog C/Ku-band receiver. Since then GI was sold to Motorola and over 100,000 units were sold. Now Motorola is introducing the HDD-200, a High Definition TV (HDTV) decoder which goes between a 4DTV receiver and an HDTV-capable TV set. The result, aside from a lot of money laid out, is a big screen-style picture.

The only problem is that, as of this writing, there are only four channels being transmitted in the HDTV format: HBO HDTV East, HBO HDTV West, Showtime HDTV East, and Showtime HDTV West, which are really just two channels, since the East and West coast feeds are identical except for being 3 hours apart. Another problem is that this is the same programming which can be found in standard digital form on the regular HBO and Showtime feeds.

Suffice it to say that HDTV programming has not yet taken off. And, finally, to really appreciate the difference, you'll need to watch the programming on an HDTV-capable TV set. I've recently been pricing these units and I found that a 32" HDTV set at a discount consumer electronics store retails for around \$2,100. That makes the \$400 HDTV decoder look cheap! You'll just have to ask yourself how much enjoyment you'd get watching HBO and/or Showtime on over \$3,000 worth of electronic gear. Most would say they get a good enough picture on their analog VCII receiver!

❖ Sources:

ST7700 MPEGII satellite receiver and DVB express "Smart Eye" Ku-band LNB from Smallear Technologies, Inc. P.O. Box 81811 Rochester, MI 48307 877-463-3212 or FAX 888-731-1834 <http://www.smallear.com>

Motorola HDD200 HDTV decoder module available from most satellite retailers including Skyvision 1010 N. Frontier Drive Fergus Falls, MN 56537 800-500-9275 <http://www.skyvision.com>

<http://www.lyngsat.com> and the MPEGII listings from Global Communications at <http://www.global-cm.net/mpeg2>. There are hundreds of channels of MPEGII programming from Canada's CTV networks, including *Newsworld International*; dozens of Fox Sports Channels, from the international fare on Telstar 5 Ku-band; the Pax network channels on GE-1, C-band, and more. And, if you can swing your dish down to the



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Q. Recently the "Check Engine" light came on in my 2000 Ford Taurus; the technician said to disconnect the car battery for about five minutes, then reconnect it. Sure enough, the light stayed off. What happened? (Mark Burns, Terre Haute, IN)

A. As with any computer, the on-board engine computer can suffer a "glitch," a false signal that it interprets as a fault. If this is the case, then disconnecting the car battery re-initializes the computer to the factory default settings, and if no problem is detected, the light won't come on.

Keep in mind, however, that you will have to reset the radio pushbuttons to your favorite stations!

Q. Is the acid used in radio batteries the same as used in flashlight cells?

A. Identical. If the chemical type says "alkaline," then it makes no difference whether they are AA, AAA, AAAA, C, or D cells, they are the same for flashlights, radios, remote controls, robotic toys, and cameras. The same can be said for nickel metal hydride, lithium ion, and nickel cadmium. Each of these chemistries is chosen for its voltage, current, rechargeability, and lifetime, not the device in which it is to be used.

Q. How do those "Indiglo" lights work, the flat-paneled night lights that glow blue-green? (Mark Burns, Terre Haute, IN)

A. The process is called "electroluminescence," which in itself is very descriptive of the phenomenon. A voltage (100-200 V) is applied across two plates (like a capacitor), but which has a luminescent chemical between them. The voltage "excites" the atoms of the luminescent material, causing them to emit photons (packets of light energy).

Q. Is there such a thing as a "lifetime" battery? (Donald Michael Choleva, Euclid, OH)

A. Not that I'm aware of. Primary ("throwaway") batteries generate current by the gradual deterioration of their internal chemistry. Even rechargeable batteries gradually deteriorate internally, any-

where from three to ten years is typical for even the best.

About the closest thing to a lifetime battery is a solar battery, but it is more accurately a passive energy converter, exchanging the energy from arriving light photons to electrical current. Of course, it can't be self-stored, and as soon as the light stops, so does the current.

Q. What is "memory" in a rechargeable battery?

A. It is pure fiction; it is a myth. "Memory" does not exist in rechargeable batteries. Decades ago, an aerospace experiment in charge/recharge cycles showed that some overcharge was necessary to get a NiCd battery pack back to full capacity; initially it wasn't done, and so the batteries exhibited reduced capacity. But as soon as the on-board computers were reset properly, those batteries came back to full charge. But this was not memory, it was simply inadequate charge - voltage depression. The myth has survived longer than the batteries!

Surely batteries can be damaged by overcharging, especially when considerable heat is involved; this can warp the electrodes as well as dry out the chemicals. And allowing batteries to be discharged deeply without recharging can allow the formation of crystalline "dendrites," fibers that can short out the cells. Both conditions will reduce the capacity and the lifetime of rechargeable batteries, but it has nothing to do with memory.

Q. My wife and I often use Family Radio Service (FRS) transceivers when in a car caravan. Is there a standard hailing or calling frequency for FRS? Have there been any documented rescues attributed to an FRS call? (Joe Wood, Gray, TN)

A. There is no question that FRS radios are having considerable impact on family outings. Pacific NorthWest REACT (Radio Emergency Associated Communications Teams) claimed two rescues in their area last year due to FRS; there may be more. Because of the potential 532 code combinations, REACT International has been trying to get Channel 1 commonly set aside for emergency calling. So far, it's a grass roots movement only.

Q. What are some good aircraft frequencies to monitor in Tempe,

Arizona? (Robert Brock, Tempe, AZ)

A. Since your closest airport is Phoenix Sky Harbor, I'd try 122.950 (UNICOM), 121.200 (Arrival), 124.300 (Departure), 122.200, 122.600, 128.650, 388.000, 119.200, 379.800, 120.700, 239.000, 126.800, 256.900, 124.100, 269.600, 123.700, 363.00, 118.700, 385.400, 120.900, 254.300, 119.750, 132.550, 118.100, and 269.200 MHz. And don't forget your Air National Guard command post on 140.000 and 311.000 MHz.

For more extensive listings of civilian and military air frequencies, try the *Grove Military Frequency Directory*.

Q. I hear a loud noise on my scanner which has a preamp on the antenna, starting at about 4 p.m. every day and it continues for hours; what can I do to cure it? (A typical type of question from many hobbyists).

A. Since there are so many causes of interference, we really do need to know more information, like:

- (a.) What model scanner do you have?
- (b.) What model antenna and where is it mounted?
- (c.) Are you using coax cable?
- (d.) Are you in a single-family home, or an apartment?
- (e.) Do you hear the noise on any other radios or TV, including interference on the picture?
- (f.) Does the noise remain when you remove the preamp from the antenna line?
- (g.) Does the noise continue uninterrupted or does it go on and off occasionally?
- (h.) Is it on all frequency ranges and in all modes (AM and FM)?
- (i.) Do you have this noise all year around, or just in the summer months (or recently started)?
- (j.) About what time does it stop?

When questions come in requiring valid answers, we need all the information you can think of regarding your equipment, your environment, and your neighbors!

Questions or tips sent to Ask Bob, c/o MT are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT, or e-mail to bgrove@grove-ent.com. (Please include your name and address.) The current Ask Bob is now online at our website: www.grove-ent.com

Gary Webbenhurst

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ab7ni@arrl.net

Radio monitoring has taken on new significance. Good or bad, there are new things to listen for, and they may impact how you live. Let's get right to the issues.

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Given the events of last September, and the growing sense of insecurity and suspicion, it is more important than ever to keep your listening profile very low. I think it would be a very bright idea to keep scanners out of the public eye, especially at airports. While we may be legally entitled to sit and monitor airport radio traffic, consider just leaving the radio at home or in checked luggage. Why take a chance on having your radio confiscated? If you are a ham, make some photocopies of your license and carry them in your checked luggage, carry-on, wallet, etc. That should satisfy most security checks. If you are not a ham, time to get your license. (Where have you heard that before?)

77

Another way to lower your profile is by using one of the new micro-sized receivers such as the Icom R-2 or Q7A. The smaller the radio, the less obvious. These radios are now selling at well under \$200. If you are a ham, check out the new Kenwood TH-F6A. Santa just delivered mine early and I really like it!

78

Earphones are always a good way to be inconspicuous. To check out the earphones used by the Secret Service agents and TV news announcers try this website: <http://www.telex.com/nav/srchprod.htm>. Then click on Headsets, then Professional. If you wish to purchase an item, click on Contact us, then Facilities and Locations. The clear plastic tubing is almost invisible unless you are looking for it. Sound quality is excellent. Warning; they are rather pricey.

79

The September issue of *Monitoring Times* was uncanny for its timeliness. "Listening in on the Middle East" was the central theme. As always, the main articles, and *Shortwave Guide* section were invaluable. Larry Van Horn's *MilCom* and *Fed Files* columns were a great reference. As aerial refueling, and fighter plane patrols are now commonplace on the east and west coasts, military air frequencies will have a new level of presence and interest. Grove Enterprises has their new *Military Frequencies CD*.

Many websites have new frequency information. The Grove Enterprises website had daily updates on frequencies of interest. It is always

as close as your computer at <http://www.groveent.com/>. Global Military communications are suddenly of interest to radio monitoring enthusiasts. I suggest you try DXing if you have not done so before. Good HF receivers can be had in the \$100-300 range. Be sure you buy from a dealer that will give you a refund if you decide that global communication is not to your interest.

80

The September issue of *Firehouse* magazine covered several topics about terrorists and building collapses. There was an article for training dispatchers to handle specific terrorist and Haz Mat incidents. Ironically, many of the articles are written by officers in the FDNY. Another great resource is the website at <http://www.firehouse.com/>

81

On a more positive note, I always see the Austin Antenna ad in *MT*. I had never taken them up on their offer of a *Scanner Users Guide* for \$1, but hey, I can afford that. It took awhile, but it finally arrived. A good basic book with great information on antenna theory and practicalities. Their price sheet was included. I am ordering a couple of their products and will publish my findings in a future column. They have no website, but can be reached at 603-335-6339. One of my bright ideas has always been a standing order to read every page in *MT*. That's right, every page, and every ad. Get your money's worth!

82

There are other gems buried in the small ads in *MT*. One is for a small dealer who specializes in antennas. The ad is small but the website is huge. They are at <http://www.antennawarehouse.com/>. As I have often commented, the antenna is *everything* in monitoring.



Hoover Dam is one of many sites where security has been heightened beyond the cruiser and bicycle cop seen here

83

Soon the snowplows will be called out. Time to doublecheck and confirm you have all the correct frequencies. I like to know how the roads are doing. I look these up and get them programmed into a special bank in the scanner. These are often in the 151, 156 or 159 MHz range. As part of your overall frequency plotting, these should already be identified as such. The Interstate and major highways will be serviced by your state DOT. School bus frequencies can also be helpful unless the drivers get too chatty.

84

Finally, we come to my Christmas gift suggestion list. Let your loved ones know your wishes! Check the Internet for best prices.

- Kenwood two meter VHF Mobile TM-261A for \$169.95
- Close out on Alinco two meter VHF 195 hand held transceiver
- ARRL Publications or products at <http://www.arrl.org/catalog/>
- RS universal power plug item 273-1816

Tip: you can use the end of a plug to move the voltage knob (RS suggests that small screwdriver will also work)

- RS Battery charger item 23-425 with battery conditioner, and alkaline detection built in item #23-425.

85

My final tip is the VERY BEST idea I could possibly give to you. This item is not cheap, but it is by far the best "radio" in my vast collection. I have used it so much, the painted edges have long since worn off. I have replaced the internal battery pack three times. Yet, I have never HEARD a single word. In fact there is no speaker. There is no audio out jack.

What is this device? It is my Scout Explorer from Optoelectronics. (There are other manufacturers of similar devices.) Simply put, this radio receiver device constantly sniffs the air (through the antenna) for radio transmissions above the threshold level of radio noise. I drive around town with the Scout mated with my high gain mobile antenna. I am amazed at all the frequencies that show up. The Scout can log four hundred different frequencies and how many times each frequency "hit." You can stuff it in a backpack, fanny pack, or your coat pocket and just walk around. The best detective for radio work I have ever had.

Let's hope the holiday season will bring some comfort as the nation is recovering from the tragic events in September. Count your blessings and enjoy the Holiday Season.

Closing out the Year

2001 is coming to an end already. Don't you just hate it when a new century just flies by? For the December edition this column, we'll revisit some issues regarding the still-fresh-in-our-memory attack of September 11th and speak with the guru of South Florida's trunking systems, Mr. Brian Cathcart.

Last month's column, as you may recall, was written just after the attack on democracy and modern civilization. One month later, the shock has been only slightly superseded by a rare combination of anger, patriotism, and community spirit.

Not one device on the planet even came close to the importance of two-way radios during the rescue and recovery period. And, not one group of people on the planet even came close to the importance of the radio operators. Fire-Rescue, Police, Emergency Management, heavy equipment operators, mortuary services, news media and every level of government relied upon two-way radios as never seen before.

Major radio manufacturers shipped thousands of radios to the rescue scenes and installed portable repeater systems within days of the attack. High-tech "sniffers" were deployed to search for radio frequency (RF) emissions beneath the rubble and debris...with the hope of finding a working radio or cellphone and a survivor.

Those who share our hobby made extraordinary use of new technologies...some of which were novelties on September 10th but essential resources on September 11th. For example, many of us were privileged to hear New York's local government (Fire and Police) communications through the Internet. We heard the events in real-time and shared in the confusion and loss and pain as events unfolded. Though all the stresses of the day, communication protocols were maintained and the professionalism of NY's radio operators did not falter. This was truly a remarkable circumstance to witness.

Web-controlled HF receivers also grew in popularity as the war commenced. Radio, just like it did 50 years ago, became the medium of choice for the most complete news. Larry Van Horn and the *MT* staff were on the communications facet of the story faster than any other media outlet. Within hours, the *MT* website had a frequency list posted and began receiving comm-related updates from around the world.

This story will continue to grow in the weeks and months ahead. Communication is-

...sues will remain at the forefront, and your local contributions will help all of us get the complete story. Postal Service channels, local Health Department systems, building and airport security freqs, news media and low-power channels should all be monitored for activity.

Use your discretion for reporting military and federal government frequencies, of course, but remember that local government channels are already in the public domain. Your frequency lists and comments regarding the attack are invited.

◆ On-Scene Commander

The attack of September 11th has brought a new perspective to democracy along with a heightened awareness of potential threats. Unless we have actual on-scene business to conduct, let's make sure we each stay on the side of the "good guys" by continuing to monitor local events from home or office locations. If you are a first-responder or bona fide support unit at an emergency scene, or a patron of a local event (sports, concerts, etc.), by all means bring your scanners and send us your lists.

Otherwise, use your common sense and realize that a "normal" activity on September 10th may now be a suspicious activity. Casual monitoring at airports, seaports and rail terminals, for example, may result in extensive questioning by authorities.

One on-scene activity that can still be enjoyed, however, is the monitoring of shopping mall security patrols. First mentioned last month by featured hobbyist Mike Fink, shopping malls often provide interesting and humorous communications. While you're out shopping for holiday gifts this year, listen for special "Grinch-buster" patrols in remote parking lots and mall areas, plus other patrols targeting shoplifters, loading docks and charity-donation areas (See related story on page 20).

As mentioned above, use common sense and be discrete. A handheld scanner clipped to your belt (with an earphone) and used during your normal shopping excursion is less likely to be noticed than parking in a back alley with your scanner blaring at top volume (so it can still be heard over that CD you just bought)!

◆ Bank Number One

I've been asked to relate what I keep in "Bank Number One" of my radios. For me, bank 1 is a combination of important channels plus an ever-changing collection of special-in-



Communications were critical in the aftermath of September's terrorist attacks (photo by Mike Coppola, Metro Fire Radio).

terest frequencies.

The first portion is set up to include local emergency and mutual aid channels, plus selected dispatch and tactical frequencies...basically a group of channels that I can rely upon to provide an immediate alert of severe events. I call this group "primary information."

The remainder of the bank is dynamic; I move frequencies in and out of the bank as my short-term interests change. On weekdays, I usually program police tactical channels or milcom frequencies that I want to check out. On weekends, sports frequencies or recreational uses (Park Rangers, etc.) are monitored. New and unidentified channels are also placed here.

Since I use computer-based scanners most of the time, I can pre-program all banks and easily select various combinations of scan banks, search ranges and individual channels. At present, I use a Radio Shack Pro-2006 with an OptoElectronics board, and an OptoElectronics OptoCom unit, both controlled by ScanStar Deluxe software (on individual computers). I also use a Radio Shack Pro-2004 and a JD-100 aviation scanner for non-computerized monitoring.

❖ Who's Listening?

The movie opens with a proud father looking out the front window of his home. A child is racing down the sidewalk, pedaling his little car as fast as he can. "Off to another fire," dad says to himself, smiling. Upon closer inspection, the child's pedal car is actually well-equipped for the task: it's the only one in the neighborhood...and probably the entire city...with a red plastic dome from an old beacon and a radio control head from an old fire truck.

Years later, Brian "The Scanner Dude" Cathcart enjoys the memory of the little pedal car and his dad's handiwork. It was the beginning of a long and exciting interaction with radios and public safety communication systems.

Dad was a volunteer firefighter and a radio installer, and he had a crystal-controlled scanner at home with fire frequencies installed. Brian recalls listening to the weekly "siren test" conducted on Thursday nights with a single, VHF low-band channel.

"It was fascinating being around the fire trucks and radios," Brian said of his visits to the station and use of the scanner. He bought his own radio later, a Bearcat BC100XL, on the advice of friends and associates who were already into scanners. Police, fire and local government channels were of interest, plus low-band skip on occasion.

With only sixteen channels available in the Bearcat, Brian quickly realized that he'd better start a list of freqs to keep track of everything. *Police Call* and other publications provided the core information for his list, but he was soon wanting additional details.

"I saw fire trucks go by and I wanted to listen, but I didn't have specific information from the books." All of the licensed inputs, outputs and simplex channels were quite intimidating, so Brian set out to further categorize local frequency usage and supplemental data. "I started making my own lists," said Brian, "and I also wanted to be part of it." To fulfill this goal, Brian joined the Palm Beach County Fire Department Explorer Program when he was eighteen.

Soon afterward, he became a volunteer firefighter (in dad's footsteps) and became known as "Mr. Radio" for his self-taught expertise. "I got to know the Fire PIO [Public Information Officer] and the guys at the radio shop...Now, I was not only listening to the communications, but I was also using the communications system. What a thrill!"

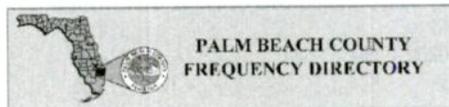
His expertise caught the eye of a local TV station that needed News Desk scanners programmed and organized. Brian answered this "call" and subsequently programmed all base and mobile scanners at the station. He was offered a job as the overnight Assignment Editor and spent several months being paid to monitor his beloved communications systems.

The TV job then moved to evening shift and expanded to include news crew dispatching and live-truck coordination. After several more months, Brian switched to field work, becoming the overnight news videographer. "That was the best application of the hobby," according to Brian. His scanners helped route him to news

scenes and allowed him to hear behind-the-scenes communications.

In the mid-nineties, Brian switched gears again and entered the field of servicing radiation therapy equipment. "I'm like the Maytag repairman," he laughed. Hardly: Brian has traveled worldwide installing and maintaining radiation therapy machines and, more recently, high-tech Patient Alignment Laser systems.

Since he was spending time at home in between his machine callouts, he put more effort into organizing his frequency lists. The result was the *Palm Beach County Frequency Guide*, a self-published directory of local channels that he sold at the local hamfest. This was followed by the *Palm Beach County Listening Guide*, a compendium of supplemental jurisdiction, dispatch and unit information. The following year both books were combined into the first title.



"The Trunk Tracker came out in 1997. I was determined to learn it inside and out...if I'm going to listen, then I have to understand it," Brian decided. He learned the new terminology of trunked systems and re-established contact with his friends at the radio shop.

Starting with a list of hexadecimal radio data plus channelization plans, Brian worked to construct a composite report that tied everything together. One agency after another was painstakingly investigated, with the best information coming from inside sources. The *South Florida Trunking Guide* was soon complete. "I owe a lot to the contributors. They want the information to be out there, even though they want to stay anonymous. That's where these books come in."



He uses the FCC website as a primary resource, plus field trips with an OptoElectronics pocket-sized frequency counter, Uniden BC245XLT, BC780XLT, Icom R2, and commercial grade 800 MHz antennas. "Ideally, I'd like to have three 780s: one in each car and one at home!"

Brian markets his books at hamfests and through mail-order sales. He spends many hours each year reconfirming old information and establishing bandplans for new systems. Last year, the entire publication was also made available on CD. (To contact Brian see his website in our "Links of Interest" or write 4050 Edgewood Drive, Coconut Creek, FL 33066-1835)

So, from racing down sidewalks as a child, to racing toward emergencies as a firefighter and later as a videographer, Brian has fully integrated radio monitoring into his work and hobby life. I expect we'll see some strobes and antennas mounted to *his children's* toys real soon!

❖ On the Keyboard

We'll start 2002 with a look into a hospital emergency room communications system, begin a series on geographic frequency lists, and get back to your mail and information requests. Have a great holiday season!

❖ Links of interest from this column:

OptoElectronics:

<http://www.optoelectronics.com>

ScanStar:

<http://www.scanstar.com>

JD-100 aviation scanner:

<http://www.sportys.com>

Brian Cathcart's South Florida Trunking Guide:

<http://www.qsl.net/ke4pmj>

Longwave Resources

✓ **Sounds of Longwave** 60-minute Audio Cassette featuring WWVB, Omega, Whistlers, Beacons, European Broadcasters, and more! \$11.95 postpaid

✓ **The BeaconFinder** A 65-page guide listing Frequency, ID and Location for hundreds of LF beacons and utility stations. Covers 0-530 kHz. \$11.95 postpaid

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Scanning Calgary International Airport

Last month's featured airport was Vancouver on the Pacific coast. This month *Scanning Canada* takes another step east to Calgary, Alberta. Vancouver and Calgary are separated by one of the most beautiful natural divides in the world – the Rocky Mountains. The highest peaks in the range lie just a couple of hours drive west of Calgary in what is called the "Continental Divide." Here jagged peaks rise to over eleven thousand feet above sea level, and snow can fall at any time of year. Driving through the famous Banff National Park often results in bear sightings (grizzlies are common here) and you are almost guaranteed to see wild elk at the side of the road.

A huge tunnel was bored in a giant spiral shape through the side of a mountain to carry the railroad on an easier grade than the older, dangerous direct grade through the Kicking Horse pass. *Scanning Canada* will return here in a future column to discuss monitoring that railroad.

An airplane ride from Vancouver to Calgary is a perfect treat for window seat travelers. You can look down in awe at the mountains below and marvel at nature's magnificence. As the plane leaves the Rockies, the terrain below quickly becomes flatter as you descend across the foothills and into Calgary International airport. Stepping off the plane, you can still see the high peaks of the mountains on a clear day.

Calgary is a clean, modern airport that carries the theme of the city's most famous annual celebration, the "Calgary Stampede" in its décor. You could call the Calgary Stampede a rodeo, but you would be selling it short; it is a huge carnival that defines Canadian cowboys. If you visit Calgary, do it in July to take in the Stampede excitement that runs through the city. Stetsons and boots are mandatory, and bring your scanner, too.

Table 1: Calgary International Airport

Air Traffic Control

All frequencies are in MHz, AM mode.

Radio: Springbank	122.50, 126.70
ATIS	114.80, 127.20
Apron/Cln Del	121.30, 260.20
Ground	121.90, 275.80
Tower	118.40, 236.60
Arrivals	125.90, 236.60
Departures	119.80, 255.10
VFR Advisory	119.40, 374.20
Edmonton Centre	128.70, 133.30, 243.50, 265.60

Table 2: Calgary International Airport

Navigation Beacons

All frequencies are in MHz, AM mode.

VOT		114.80
VORTAC	YYC (- . - . - . - . - . - .)	116.70
ILS:	IYC (. . - . - . - . - .)	111.50
	IEM (. . . - -)	109.30
	IAQ (. . . - - . - .)	110.90

Table 3: Abbreviations used

ATIS:	Automatic Terminal Information Service
CLNC DEL:	Clearance Delivery
ILS:	Instrument Landing System
VFR:	Visual Flight Rules
VOT:	VHF Omnidirectional range Test Facility
VORTAC:	Combination of VHF Omnidirectional Range and Tactical Air Navigation (TACAN)

❖ Canadian-Russian Military Contacts

Canada enjoys a very long, friendly border with its trading partner and ally, the United States. Along most of the border Canada is north of the United States, but many people are surprised to hear that Canada's southernmost point (Pele Island in Lake Erie) is actually further south than about 30% of the USA – and that's not even counting Alaska!

Canada has another neighbor over the other side of the top of the world – Russia. The frozen Arctic Ocean provides a permanent link between Canada and Russia. During the Cold War, Canada was host to the DEW (Distant Early Warning) Line of radar sites. Canada was right between what were then the world's two superpowers and felt compelled to prepare for encounters between its own military forces and those of Russia. The picture in this month's column is a composite snapshot of Resolute, one of the communities in Canada's Arctic visited by *ScanCan*. Resolute is in the territory of Nunavut, where Canadians and Russians are most likely to meet each other.

Canada and Russia have established a procedure for pilots to make radio contact in order to head off "dangerous military activities" between the two. Radio communication is established on VHF (121.5 MHz), or UHF (243 MHz). Once contact has been made, sustained communication is conducted on 130.0 MHz for VHF contact, or 278 MHz for UHF contact. A similar procedure exists for contact between ground vehicles when

frequencies of 44.0 or 46.5 MHz would be used. It is interesting that the initial contact frequencies (121.5, 243 MHz) are also assigned to ELTs (Emergency Locator Transmitters). However, ELTs transmit a siren-like modulation that can be recognized by COSPAS/SARSAT (Search and Rescue) satellites. If ELTs have been activated, or line-of-sight communication is impossible, alternative HF frequencies are available.

Specific callsigns are used by Russian and Allied forces. Aircraft are identified as "Sedlo" (Russia), "Horse" (Canada) and "Ivory Eagle" (NORAD). Air Traffic Control uses "Zemlya" (Russia), "Cloud" (Canada) and "Electric Light" (NORAD). Ships use "Polya" (Russia), "Sword" (Canada) and "Post Pounder" (NORAD).

The communication protocol will be familiar to hams; the other party's callsign is repeated three times, followed by "Delta Echo (de)", then the calling party's callsign and one of an agreed set of defined key phrases for clarity. Perhaps clarity isn't at all a bad idea in any circumstances involving a chance meeting of military forces that haven't yet fully defined their new post-Cold War relationship.

❖ Airborne Traffic Reporters

ScanCan can report another media hit on the VHF-Low band. Twin Toronto radio stations 680 News on the AM broadcast band and CHFI on the FM broadcast band share the same traffic aircraft. This aircraft operates only during peak morning and evening travel periods. Separate up/down frequencies are used; 150.67 MHz (ground to air) 151.79 MHz (air to ground). The airborne traffic reporter can be heard in friendly argument with his studio colleague about the location of traffic jams. You can learn a lot about how rush hour traffic reports are put together by listening to the conversation between the studio and the aircraft.

And finally, from Canada, the country that has the best claim of ownership to the North Pole, home of Santa Claus, Merry Christmas to all and a happy new year! 73 de John, VA3KOT



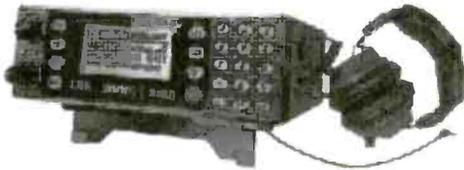
Canadian forces protect Arctic communities like Resolute, just 1000 miles from the North Pole.

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- Bearcat 80XLT 50 channel handheld scanner.....\$99.95
- Bearcat 60XLT 30 channel handheld scanner.....\$74.95
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Utilities Go To War

The universe changed on the eleventh of September 2001, but shortwave utility radio didn't. Mostly, it just got busier.

First frequency to light up was 9023 kilohertz (kHz), which has long been used by US and Canadian units in the North American Aerospace Defense Command (NORAD). For the next two or three days, voice traffic was far heavier than normal. It was also interspersed with the distinctive bzzt-bzzt, bzzt-bzzt of military tactical data links. Only two kHz higher, on 9025, were other US military stations, with voice Emergency Action Messages (EAM), plus the turkey-like gobbles of Automatic Link Establishment (ALE). At certain times of day, there was also the traditional light interference from Islamic Republic of Iran Broadcasting, a longtime user of amplitude modulation (AM) on 9022 kHz.

This was quickly followed by the activation of two US government radio networks, neither of which should be any stranger to readers of this column. Everyone knows the Federal Emergency Management Agency (FEMA) from natural disasters, but fewer listeners remember this agency's lead role in civil defense emergencies as well. FEMA activated its National Emergency Coordination Net (NECN) on 5211 and 10493 kHz, both upper and lower sideband (USB and LSB).

On the West Coast, the US Coast Guard's Communications Area Master Station, Pacific (CAMSPAC) was frequently heard checking into the NECN with FEMA's control station WGY 912 in Virginia. CAMSPAC reverts to its callsign of NMC on this net. WGY 912, a station which can be operated from a shelter deep inside a mountain, had a rare beep on its transmissions.

At about this same time, the federal government's Shared Resources (SHARES) frequency pool/interoperability net activated at readiness level two, which sets up a procedure of regular check-ins for a list of available stations. These check-ins were evident on both SHARES Coordination Net frequencies, which are 5236 and 14396.5, upper and lower.

The activation of US air defenses also increased use of the Global High-Frequency System by tankers and support aircraft working stateside. For several nights, West Coast listeners could follow the same tanker, as it threw schedules out the window and served the many aircraft needing fuel. The Global continues rather busy, with both local operation at its ground stations and remote operation from Andrews Air

Force Base in Maryland. Andrews, when it comes up with a high-priority EAM, is something to hear. Sometimes it has as many as five echoes from widely separated relay transmitters.

The only change in the Global, at press time anyway, is that the ground station at Incirlik Air Base in Turkey has been put back into service. This station had been replaced by Sigonella, in Italy, but agreements with the Turkish government brought it back. Sigonella stays on the air as well. The Global's frequencies remain 4709, 4724, 6712, 6724, 6739, 8992, 9007, 10780 (backup at Cape Canaveral), 11175, 11181, 11271, 13200, 13212, 15016, 15038, and 20390 (backup at Cape Canaveral). By far the busiest of these are 11175, 8992, and 6739, pretty much in that order. Another interesting frequency is the air-to-air channel on 6761, which is sometimes used in refueling. These are all upper sideband.



Note that all frequencies mentioned in this column have been well-documented in unclassified military publications for many years. A lot of things that look like deep secrets are really not. Be absolutely assured that Utility World will never knowingly compromise operations in progress.

Cuban "Numbers" Are Real

An interesting sideshow in the anti-terrorist sweep was the September 21 arrest of Ana Belen Montes, a senior intelligence analyst with the Federal Bureau of Investigation in Washington, DC. She was charged with spying for Cuba.

According to the next day's *Miami Herald*, part of the evidence was on a laptop computer, where there were references to "numbers that you receive via radio." In fact, one entire mes-

sage copied from the "Atencion!" numbers station was found transcribed on Montes' hard disk.

This message began with a preamble, "30107 24624," and then 150 code groups. This is the perfect "V2a" format, as designated by ENIGMA, the European Numbers Intelligence Gathering and Monitoring Association. The FBI quickly matched this message to a broadcast made February 6, 1999, on 7887 kHz.

Montes allegedly contacted her superiors in the Cuban intelligence network by calling pager numbers from pay phones, and submitting coded messages. Since her FBI position put her in charge of the disposition of intelligence from that country, it looks rather apparent that she was working both sides.

The *Herald* continues, "the technique of receiving coded data over shortwave radio is common with Cuban intelligence, and is the same method that 10 convicted Cuban spies arrested in South Florida in 1998 used to contact their handlers."

While the Cuban "numbers" have been one of shortwave's more tantalizing mysteries for nearly forty years, some still argue that it's a hopelessly outmoded system, kept going mostly as a colossal diversion to make other countries waste resources on it. Usually, this argument is supported by citing the incredibly sloppy engineering of the Cuban stations, which indeed makes one wonder whether anyone is awake. Year after year, listeners are entertained by Radio Havana bleeding into the already pretty wretched audio. Tapes, and even modes, change in the middle. Open mikes pick up parrots screeching in the background. It never seems to get any better.

However, we once again see good evidence that, in fact, someone really is listening to "Atencion" and its "cut number" Morse code equivalent. News media did not report the model of receiver supposedly being used by Montes, but she would not have needed much. An old-fashioned system it may be, but it works.

Recent "Atencion" Frequencies

All amplitude modulation (AM)
All start on the hour

3292	3389	4014	4028	4174	4479
5417	5762	5800	6768	6855	7734
7887	8097	9063	9142	9153	9260
9270	9323	9328	9331	10445	11566
12180	12215	12835	13436		

ABBREVIATIONS USED IN THIS COLUMN

AFB	Air Force Base
ALE	Automatic Link Establishment
AM	Amplitude Modulation
AMC	US Air Force Air Mobility Command
ARQ	Automatic Repeat Request teleprinting system
AWACS	Airborne Warning And Control System
CAMSLANT	Communication Area Master Station, Atlantic
CIA	US Central Intelligence Agency
CW	Morse code telegraphy ("Continuous Wave")
DEA	Drug Enforcement Agency
DX	Distant Transmitter
E5	US CIA "Counting" numbers station
E10	Israeli phonetic numbers station
EAM	Emergency Action Message
FBI	US Federal Bureau of Investigation
FEC	Forward Error Correction teleprinting system
FEMA	Federal Emergency Management Agency
JSTARS	Joint Surveillance Target Attack Radar System
M16	8BY, French intelligence, CW numbers
MFA	Ministry of Foreign Affairs
NORAD	North American Air Defense Command
PR	Puerto Rico
RSA	Republic of South Africa
RTTY	Radio Teletype
SHARES	Shared Resources
Sitor-A	Simplex Teleprinting Over Radio, ARQ mode
UK	United Kingdom
Unid	Unidentified
US	United States
V2a	Cuban "Atencion!" numbers, 3-message format

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 (encrypted, usually unidentified, broadcasts thought to be intelligence-related) are identified in () with their ENIGMA station designators, as issued by the European Numbers Intelligence Gathering and Monitoring Association.

2250.0	OWF-Danish Air Force, Skrydstrup, working OWK, AF headquarters, Vedbaek, in ALE at 1758. OWE-Danish AF, Karup, working OWP in ALE, at 1927. (Day Watson-UK)	5708.0	Reach 511R-AMC, with an ALE-initiated patch to Rota via Lajes, at 0429. (Mid-Atlantic DXer-MD)
4015.0	KPA2-Israeli intelligence, Phonetic Alphabet Station (E10), null-message callup in AM at 2115. (Ary Boender-Netherlands)	5714.0	Architect-Royal Air Force, UK, with airfield conditions at 2330. (Boender-Netherlands)
4027.0	Cuban "cut number" station (M8) with CW "numbers" at 0303. (Camillo Castillo-Panama) [A "genuine" Cuban spy was caught using V2/M8 in September. This stuff's for real. -Hugh]	5717.0	Canadian Rescue 310-Canadian Forces, Greenwood, patching Halifax Rescue Coordination Center, switched to 6694, at 2113. (Perron-MD)
4360.0	MIW2-Israeli intelligence (E10), null-message callup in AM at 2115. (Boender-Netherlands)	5732.0	TRC-US Customs Service, old scanning tones, then ALE sounding at 0426. (MADX-MD)
4481.0	OWK-Danish Air Force, calling unknown station in ALE, at 1947. (Watson-UK)	5758.0	Cuban "cut number" station (M8) with CW "numbers" at 0305. (Castillo-Panama)
4721.0	Reach 7048-AMC, in patch to Charleston Command Post at 0423. (Tom Severt-KS)	6270.0	ULX-Israeli intelligence (E10), with AM callup, "group 50," then "numbers" message at 0230. (Boender-Netherlands)
4742.0	Ascot 3549-Royal Air Force, UK, checking in with Architect, RAF, UK, went to 9031, at 0300. (Ron Perron-MD)	6370.0	MIW2-Israeli intelligence (E10), null-message callup in AM at 2115. (Boender-Netherlands)
5091.0	JSR2-Israeli intelligence (E10), null-message callup in AM at 2030. (Boender-Netherlands)	6693.0	"N-9-S"-Probably US military, Italy, working aircraft MFR1, at 2105. (Boender-Netherlands)
5170.0	KPA2-Israeli intelligence (E10), null-message callup in AM at 2115. (Boender-Netherlands)	6694.0	Rescue 310-Canadian Forces, in radio check with Halifax Military, came from 5717, at 2115. (Perron-MD)
5320.0	Coast Guard Group Atlantic City-US Coast Guard, NJ, working cutter Mako, in a search for a trawler at 2134. (Perron-MD)	6697.0	MKL-UK Royal Air Force, Kinloss, in radio checks with "X-4-S" at 0404. (MADX-MD)
5339.0	MIW2-Israeli intelligence (E10), null-message callup in AM at 2115. (Boender-Netherlands)	6721.0	Sentry 54-Front end of US Air Force AWACS, with a patch to Hickam for weather at 1113. (Severt-KS)
5435.0	ART-Israeli intelligence (E10), with AM callup and "numbers"-messages, at 2000. (Boender-Netherlands)	6809.0	WGY 906-FEMA Region 6, TX, advising WGY 946, FEMA, LA, that the National Emergency Coordination Net was active for terrorist attacks, at 1127. (Severt-KS)
5696.0	Coast Guard Group Miami-US Coast Guard, working Rescue 1713 (a C-130), Rescue 6032 (a helicopter), and Shark 18 (a cutter), in a lengthy search for a missing State Department aircraft, at 0231. (Allan Stern-FL)	6866.0	Cuban "cut number" station (M8) with CW "numbers" at 1210. (Castillo-Panama)
		6912.0	KPA2-Israeli intelligence (E10), null-message callup in AM at 2115. (Boender-Netherlands)
		7447.0	SYN2-Israeli intelligence (E10), null-message callup in AM at 2145. (Boender-Netherlands)
		7535.0	Theodore Roosevelt Tech Control-Probably USS Theodore Roosevelt (CVN-71) working Norfolk at 1217. (MADX-MD)
		7605.0	VLB2-Israeli intelligence (E10), null-message callup in AM at 2150. (Boender-Netherlands)
		7632.0	Darkstar Romeo-US Air Force, calling Halfback Alpha at 1309. (Severt-KS)
		7657.0	Gantsec-US Coast Guard, Greater Antilles Section, PR, working Herk 20 (a C-130) at 2146. (Perron-MD)
		8051.7	Unid-Egyptian Embassy, Paris, France, with long Sitor-A messages in Arabic, at 1938. (Watson-UK)
		8094.0	FDC-French Air Force, Metz, with CW markers at 0524. (MADX-MD)
		8103.0	4XZ-Israeli Navy, Haifa, with CW plain text traffic possibly in Hebrew, then back to marker at 2201. (Watson-UK)
		8187.7	9MR-Malaysian Navy, testing in RTTY at 1745. (Bob Hall-RSA)
		8298.0	VTP-Indian Navy, Vishakpatnam, calling ships in RTTY at 1703. (Hall-RSA)
		8499.7	VTH-Indian Navy, Bombay, with RTTY markers at 1657. (Hall-RSA)
		8965.0	Chalice Bravo-US Air Force, asking Charlie Flight (in a patch) for tanker frequency, given 6761, at 1936. (Severt-KS)
		8971.0	Blue Star-US Navy, Roosevelt Roads, PR, asking Hunter 01, probably a British aircraft, definitely on Caribbean drug interdiction, at 0120. "C-5-C"-Probably Royal Air Force, in radio checks with an unheard station, at 0436. (Perron-MD) Blue Star calling Hunter 01 and 02, no joy, at 0622. Ram 03, working Blue Star clear and secure, at 0625. (MADX-MD)
		8980.0	Coast Guard 1706-US Coast Guard, patching Clearwater via Camslant, at 2243. (Perron-MD)
		8983.0	Coast Guard 2121-USCG aircraft, in radio check with Camslant at 2121. (Perron-MD)
		8992.0	Andrews-US Air Force, with EAM, then "Oops, this is the wrong one, disregard," at 0640. Andrews, with the right EAM, at 0642. (MADX-MD)
		9005.4	Some of the same post-attack players as 9023, including Evergold working "R-8-C" and "X-8-T" at 0551. (Jeff Haverlah-TX)
		9016.0	King Crab-US military, calling Rams Head, no joy, at 0418. (Haverlah-TX)

- 9023.0 Heavy NORAD and US Air Force use after the terrorist attack, including Okie Sam (clear and secure), Defiant Gray, Evergold, Geodetic, Northern Lights, several single-letter calls, and several trigraphs, at 0527. Darkstar Romeo, calling Wellington, finally raising Juliet, at 0700. Defiant Gray working Available Bravo, then calling Chalice Bravo, at 0731. (Haverlah-TX) Bravo Foxtrot-US Navy, setting up a tracking net ("Alligator Playground"), at 1242. (Sevart-KS)
- 9122.5 WUG-US Army Corps of Engineers, taking net roll call at 1557. (Sevart-KS)
- 9130.0 EZI-Israeli intelligence (E10), with AM callup and "numbers"-messages, at 2000. EZI, with messages at 2030. (Boender-Netherlands)
- 9145.0 Ghost rider Base-US military, working 374, at 1634. (Sevart-KS)
- 9219.0 Unid-US CIA "counting station" (E5), with "numbers" at 2200. (Boender-Netherlands)
- 10200.0 SI1-FBI, Springfield, IL, working CO1, OH, in ALE at 2254. (Watson-UK)
- 10235.0 T159-US Army, sounding in ALE at 0705. (Watson-UK)
- 10248.0 8BY-French Intelligence (M16), with a CW calling marker at 0448. (MADX-MD)
- 10527.0 Unid-US CIA "counting station" (E5), in progress at 2236. (Boender-Netherlands)
- 10690.0 NGB55-US Army National Guard, TX, working NGB47, OK, at 1328. (Sevart-KS)
- 10720.5 Shadow Warrior-Control in US military net with Horseman 01, 20, 30, and 40, clear and secure, at 2151. (Haverlah-TX)
- 10820.0 CIO2-Israeli intelligence (E10), null-message callup in AM at 2145. (Boender-Netherlands)
- 11175.0 290066-US Air Force, calling ADW (Andrews AFB) in ALE, at 0710. "Boeing 707," calling Andrews, no joy, at 2042. (Haverlah-TX) Navy 962-US Navy, with a post-attack patch into DC via Andrews, at 1552 (Sevart-KS) Reach 6947-AMC, in a patch to Hilda East, at 1945. (Stern-FL) Bluegrass-FEMA, calling Andrews at 1944. SAM 9002-US VIP flight, in radio check with Andrews at 2009. Razor-US military, calling Mainsail [general call: "any station" -Hugh], at 2106. Reach 160-AMC, working Thule AB, at 2118. (Sue Wilden-IN) Navy LY 336-US Navy, calling Mainsail, Offutt answered but no further response, at 2116. (Perron-MD)
- 11225.0 Fuzhou-Chinese diplomatic, China, with voice in lower sideband and data in the upper, at 2249. (Boender-Netherlands)
- 11226.0 Reach 630-AMC, with patches to Mildenhall via Andrews, at 0302. (Sevart-KS)
- 11232.0 Tiger 325-Canadian Forces C-130, working Trenton at 1338. Razor 33-US Air Force JSTARS, working Trenton, at 1341. (MADX-MD) Canadian Rescue 337-Canadian Forces, Winnipeg, in a search for an overdue fishing boat, at 2040. (Perron-MD)
- 11244.0 Goliath Alpha-US Air Force, calling Rowboat, no joy, at 2231 (Haverlah-TX)
- 11247.0 Haven-UK Royal Air Force, Ascension Island, in radio check with unheard station, then weather, at 0345. (MADX-MD) Architect-Royal Air Force, UK, working Ascot 2020 at 1117. (Boender-Netherlands)
- 11291.0 Ascot 3231-Royal Air Force, UK, giving position to Dakar, Senegal, at 0118. (Perron-MD)
- 11330.0 Air Evac 1533, in air traffic control with New York, at 1533. (MADX-MD)
- 11439.0 T159-US Army, sounding in ALE at 0441, then gave a network command at 0635. (Watson-UK)
- 11495.0 1260-Possibly Iranian military, sounding in ALE at 0327. 1210, giving network commands at 0300. (Watson-UK)
- 11550.0 SI1-FBI, Springfield, IL, working CO1, OH, in ALE at 0139. T159-US Army, with ALE sounding and network command, at 0658. (Watson-UK)
- 12087.0 MMAANGB-Possible US Army National Guard, calling HQ1NGB, National Guard Headquarters, Arlington, VA, in ALE at 2129. (Watson-UK)
- 13200.0 Toil 40-US Air Force, patching Toil Ops (Maxwell AFB, AL) via McClellan, at 0004. (Perron-MD)
- 13212.5 Sentry 62-US Air Force AWACS, in patch to Raymond 24 at 1704. (Sevort-KS)
- 13396.7 Unid-Egyptian Embassy, Washington, DC, with Arabic and English traffic in Sitor-A, at 1953. (Watson-UK)
- 13443.0 Unid-Encrypted CW message in 4-letter groups, ended at 1126. (Geoff Halligey-UK)
- 13533.0 CIO2-Israeli intelligence (E10), null-message callup in progress at 1650. (Halligey-UK) EZI-Israeli intelligence (E10), with AM "numbers" at 2000. (Boender-Netherlands)
- 13555.0 CIO2-Israeli intelligence (E10), null-message callup in progress at 1640. (Halligey-UK)
- 14367.7 kdakrfzhm-Egyptian MFA, Cairo, with an Arabic ARQ broadcast to all embassies, at 1634. (Hall-RSA)
- 14396.5 KWB 406-US Department of Transportation, Iowa, checking into SHARES Coordination Net, at 2117. (Wilden-IN)
- 14440.0 LOAM-Unknown CW station [Russian military? -Hugh] calling KCLG and NIDA, then traffic in 5-letter groups, at 0935. (Halligey-UK)
- 14505.0 Unid-French Forces, idling in ARQ at 2936. (MADX-MD)
- 14556.0 H6L-French MFA, working P6Z, Paris, with short CW messages, rare for French to use this mode instead of FEC, at 0815. (Halligey-UK)
- 14585.7 Unknown, probably RFPT, French Forces, N'Djamena, idling in ARQ at 1952. (MADX-MD)
- 14620.0 "Cheteeri Shest Nul"-Unknown AM station, with a male voice giving a repeated callup and a message in Serbo-Croatian, at 0950. (Halligey-UK)
- 17973.0 DL0002DAT-Unknown station sounding in ALE at 1603. (MADX-MD)
- 17994.0 Trenton Military-Canadian Forces, working Sentry 60 (an AWACS), at 2107. (Perron-MD)
- 18003.0 Reach 463-AMC, in a patch to Travis via Andrews, at 2214. (Sevart-KS)
- 18258.5 HBD20-Swiss MFA, Bern, with an hour-long Sitor-A message in 5 letter code groups, at 1728. (MADX-MD)
- 19131.0 Panther-US Drug Enforcement Agency, calling 32C, probably US Coast Guard on drug operation, at 1431. Panther 200-DEA, in radio checks with Atlas at 1435. (MADX-MD)
- 19204.7 RFTJ-French Forces, Dakar, Senegal, with ARQ broadcasts at 0517. (Hall-RSA)
- 20602.0 ASI-UK military, Ascension Island, ALE sounding at 1227 and 1540. (Hall-RSA)
- 23591.0 S85-Swedish Embassy, Brasilia, sounding in ALE at 1851. (Hall-RSA)
- 24370.0 P6Z-French MFA, Paris, with an FEC bulletin of new Middle East postal security procedures, at 0948. P6Z calling S5F, French Embassy, Brasilia, in FEC at 1156. (Hall-RSA)
- 25022.0 MGJ-UK Royal Navy, Faslane, with RTTY channel bulletins at 1308. (Watson-UK)
- 25222.0 S84-Swedish Embassy, Washington, DC, working S93, Swedish Embassy, Havana, Cuba, in ALE at 0159. (Watson-UK)
- 26221.0 S92-Swedish Embassy, Managua, Nicaragua, sounding in ALE at 1255. (Watson-UK)
- 26241.7 Rffku-French Navy, with ARQ administrative message to frigate Albatross, at 0814. Rfvitb-French Navy, Le Port, with coded ARQ messages to rffim (Paris), and rffuhfr (Air Force?), at 0820. Rfvins-French Frigate Nivoise, with a coded ARQ message to 28 stations, at 0831. Rfvit-French Navy, St. Denis, with a message in French to "Regspahis Valence," at 0838. Rffkc-French Navy, Brest, with ARQ news broadcast to all stations, at 0910. (Hall-RSA) [These and other extraordinary French messages were apparently the beginning of a huge exercise, possibly linked to US anti-terrorism. -Hugh]
- 26331.7 Rfvit-French Navy, with ARQ message to Paris, at 0638. Rfvires-French Air Force, La Reunion, with ARQ message to Port de Galets, at 0650. Rfvic-French Navy, with ARQ message to Port de Galets, at 0654. Rfvibds-French Navy attack ship La Boudeuse, with ARQ message to rfflcm, Toulon, at 0707. (Hall-RSA)
- 26441.5 Rhrm dof-French military, with 400 pages of coded ARQ messages, then a huge list of participating assets, at 1515. Continuous broadcasts to Indian Ocean war ships continued for hours. (Hall-RSA)
- 29940.0 S84-Swedish Embassy, Washington, calling Havana in ALE at 0155. (Watson-UK)

North Korean Diplomatic Service

This month we take a look at the North Korean Diplomatic Service, a relatively simple catch either late nights or early mornings in the US. We also update you on a few ALE network developments and profile the various Rohde & Schwarz systems audible on HF.

MFA Pyongyang

There are a number of very distinctive features that can be used to identify the North Korean diplomatic service:

- they use 1000Hz (that's right, 1kHz!) shift Baudot, usually at 50bd
- they use a particularly nasty sounding 150, 300, 600 or 1200bd BPSK
- they send text in romanized Korean

Figure 1 shows an example of the romanized text. Note the characteristic lead-in of "mf aa/bb nr cccc" where "cccc" represents the message number.

```
gonggai  
mf 72/78 nr 0157  
sengmyenggen  
qyeimein zosenchinsen hyebhoineun 1 qi mlyenbatw~euitonggil  
sengmyengzenmun((qalloqi qalqam))sinmun 1 qil buqigeizaiham. sengmyeng  
daqueumgoa gatqeam.  
qyeimein-zosenchinsenhyebhoineun golyeminzulyenbanggonghoagug  
changlibangon zizuelganqai zeuqumhaqye golyeminzulyenbanggonghoagug  
qaul changlibaneun baee. tonggil qaul silhyenholyleneungchirsenzeg zoselinqzui  
tuzaing ~oihan zenzegain zizqoa lyendaisengqaul zaihaoggen handa. girqiseng  
zusegnizggeseneun 1980 nyen 10 quel hanaqeuiminzong  
hanaqeuigguga, dugoizeido, dugoizengbuqegichohantgolyeminzu
```

Oddly, MFA Ulan Bator's romanized Mongolian does look very similar to the Korean language; however, we have not noted a logging of the Mongolians for many years.

Baudot is also used to send off-line encrypted messages using five figure groups. An additional group indicates the x100 groups every tenth line. Figure 2 shows an example of the encrypted text:

```
mf42/58 540 50  
51403 34885 10093 32399 15128 24773 75965 72732 82143  
68773  
89197 60260 59109 65490 66431 36003 63047 47229 07832  
19512  
37554 41129 60767 28378 99504 57439 10276 78391 66347  
36530
```

During the winter months, MFA Pyongyang can be heard for long periods during the late evening (after 11pm EST) and into the early morning hours. Currently, most activity seems to be centered between 10800 and 10900 kHz. Other spot frequencies to try include:

```
8817.7 8832.7 8871.8 8878.1 8882.2 10460.0 10467.0  
10563.3 10594.6 10613.0 10653.1 10662.0 10691.0 10693.0  
13307.3 13314.7 13317.0 13820.0 14742.9 15856.0 16167.9  
16240.2 16242.0 16249.3 16422.0 18111.0 18815.9
```

◆ More ALE Network Developments

Rockwell Collins

This large electronics and communications conglomerate has a number of HF frequencies that it uses for test purposes. The channels were recently confirmed by a paper submitted to this year's HFIA conference in Sweden, which presented the results of some comparative over-the-air tests of the new MIL-188-141B ALE standard.

A number of the XXXSIL identifiers have also been heard on US Air Force ALE channels, probably due to the refit of various aircraft with the GATM (Global Air Traffic Management) system project which is managed by Rockwell.

Identifiers:

ADNSIL Systems Integration Lab, Andrews AFB, MD?
CRNSIL Systems Integration Lab, Cedar Rapids, IA
MCNSIL Systems Integration Lab, Manchester, IA
RSCSIL Systems Integration Lab, Riverside, CA
SYA Fairfield, TX
SYASIX Fairfield, TX
SYC Riverside, CA
SYCSIX Riverside, CA

Frequencies (USB):

4050, 7650, 10200, 10400, 11550, 13242, 13950, 15960, 17450 kHz

MITRE Corporation

Some good detective work by MT's very own Larry Van Horn solved a longstanding set of unknown ALE identifiers. MITRE Corporation, which undertakes a number of studies on behalf of the Department of Defense and other government agencies, has a very impressive HF antenna "farm" at its Bedford, Mass., location just outside Boston. A recent paper published on MITRE's website revealed the locations of some stations heard sending ALE and following up with MIL-188-110A traffic:

Identifiers:

DER Derry, NH
MB1 Bedford (Mailbox 1), MA
MB2 Bedford (Mailbox 2), MA
NFK Norfolk, MA
NOR Norfolk, MA

Frequencies:

4561.7 (USB), 6780 (LSB)

◆ Rohde & Schwarz HF Systems

This long-established German manufacturer of HF communications gear has developed a number of successful systems over the years, most of which remain audible today.

228.7bd RS-ARQ

Rohde & Schwarz simplex ARQ has been used by German, Italian (diplomatic and MOI services), Turkish Diplomatic Services, and a number of NATO Forces (evidenced by KG84 encrypted traffic). RS-ARQ typically runs at 228.65bd but reports of 457.0bd have been noted, both with a tone shift of 170Hz. The system usually shows an ACF of 59.

There appears to be no "real" name for the data system, and is referred to as ALIS in Kligenfuss publications but strictly speaking, ALIS is only the automatic link processor (ALE) and frequency management system.

The Germans abandoned the system in 1996 but the Italians and NATO forces appear to still use the equipment sparingly.

A packet-like FEC system, believed to be another RS-ARQ variant, has also been heard running at 225bd with a shift of 170Hz.

240bd 8 Tone RS-ARQ

This is the 240 bd 8-tone burst ARQ mode used in the Rohde & Schwarz MERLIN modem. With a distinctive sound like a honking donkey, the system is found in the 7-tone mode when it is in ISS mode, the IRS mode uses an 8 tone signal. Both measure as 240bd (720 bits/sec) with each tone shifted by 240Hz. Traffic can be sent in the 5-bit (ITA2/Baudot), ASCII (7 bit) or with ASCII (8 bit) codes - 8 bit ASCII being the most common.

Turkish diplomatic stations are the most commonly found users (8 bit ASCII), but the system is also used by the Italian diplomatic service who seem to favor the 5 bit (ITA2) mode.

The 8-tone modem still uses the 228.7bd ALIS signal for ALE and frequency management purposes, but displaced by -2kHz from the centre of the 8-tone signal. So if you hear an ALIS procedure in progress on a frequency it's worth waiting to see if 8 tone traffic appears 2kHz higher soon after.

Resources

228.7bd RS-ARQ Audio Clip
<http://over.vistecprivat.de/~signals/WAV/RS228-65.WAV>
8 Tone RS-ARQ Audio Clip
<http://rover.vistecprivat.de/~signals/WAV/RS240-81.HTML>

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All Ears on Afghanistan

The war against the Taliban immediately had impact on shortwave and from Afghanistan. A roundup:

In the Northern Alliance area, Takhar Radio in Taloqan was previously on 7000v kHz at 0830-0930 UT but not recently confirmed before Oct. 7, said BBC Monitoring. The only TV station in Afghanistan is at Feyzabad, TV Badakhshan, in the rebel-controlled province of the same name. An FM station is off the air, but the Chinese government recently donated two shortwave transmitters, which were scheduled to arrive by November, reported Andrew Maykuth, in the Philadelphia *Inquirer* Oct. 1 via Joe Hanlon.

In response to a question in a press briefing at the Pentagon, Defense Secretary Rumsfeld confirmed at 1908 UT Oct 7 that Commando Solo broadcasts to Afghanistan had begun. Ivan Grishin heard it mentioned on BBC Radio 4 at 1600+ UT Oct 8, that "Taliban Radio" had again gone off the air with renewed bombing. V. of Shariah disappeared from 7084v Oct 8 at 1609 UT during a broadcast in Turkmen, precisely when Kabul was hit by a barrage of cruise missiles and bombs dropped from B-1 and B-2 heavy bombers. Yuki Sakagami

and Nick Grace reported in *Clandestine Radio Watch* that an area outside of Kabul, known as TV Mountain, where radio and television broadcast towers are located, was strafed, per Reuters. Recording of the final moments is at <http://www.clandestineradio.com> Reports of some civilian casualties at the village of Yakutat near Kabul perked up my ears, since "YAK" was once known as the transmitter site of the old R. Afghanistan. (Not to be confused with Yakutat, Alaska.) DOD before and after photos of strike on V. of Shariah: http://www.clandestineradio.com/dossier/afghanistan/dod_oct11.htm Also nearby is an audio file of the final moments.

Commando Solo to Afghanistan was first reported by Robin L. Harwood, Tasmania, in *DX Listening Digest* Oct 13, on 8700-USB at 1315 with song about Kandahar, and references to Afghanistan, Kabul, Herat and Osama Bin Laden. Subsequently reported from all over the world, scheduled 0030-0530, 1230-1730. Believed to be a feed to the plane rather than from it, perhaps via Diego Garcia or another nearby base. These PsyOps are carried out by Air National Guard 193rd Special Operations Wing based at Harrisburg International Airport.

ANGOLA [non] Radio Eclésia, B-01 via Germany, 160 degrees: daily 0500-0559 11795; 11800-1900 (Sat 1900-2130) 13810 (DTK via Kai Ludwig)

ARGENTINA Radio Continental, 29810.00-LSB, broadcast feeder at 2049, Spanish interview, ID, weak but clear (Mark Mohrmann, VT, *DX Listening Digest*)

AUSTRALIA Before the Sept. 11 disasters occurred, AFP reported that officials of town of Kununurra were concerned that a new Protestant evangelical SW station would make Kununurra vulnerable to an attack from Muslim extremists. The station will be operated by HCJB and transmit a Christian message to East, South, and Central Asia (Kim Elliott, *VOA Communications World*)

During very high solar activity but quiet geomag conditions Sept 25, both 21820, R Australia, and 2310, ABC were audible at 0930. WWV reported solar flux was 279, K index 2 (David Hodgson, TN, *DX Listening Digest*)

AUSTRIA Despite the fact that ORF faces a decrease in revenues and is thus forced to make spending cuts, it has decided to keep Radio Austria International on the air in 2002. We are therefore in a position to continue to offer you an interesting programme in all our six broadcast languages. Thanks to our listeners for their support. From the beginning of 2002, Radio Austria International will have only a third of the funding it had at its disposal in 1999. We will, however, make every effort possible to ensure that the financial loss will not result in a loss of quality in our programming (Prof. Rolond Machatschke, Managing Director via Mike Terry, BDXC-UK)

[non] Relay schedule via Sackville for B-01 shows RAI still on 17865, at 1600-1659, 250 kW, 272 degrees to USA (via Bill Westenhaver) Including English at 1630 (Wolf Harrant, RAI)

BANGLADESH Bangladesh Betar External Service B-01 until 24/03/02 includes GOS in English 1200-1300 on 7185 and 9550 to S/SEAs at 60 and 125 degrees; and 1815-1900 on same plus 15520 to Eu 320 degrees; also 1745-1815 V. of Islam, in English on same 320. Reports To: Senior Engineer (Research Wing), National Broadcasting Authority, Bangladesh Betar, 121 Kazi Nazrul Islam Avenue, Shahbag, Dhaka-1000. rrc@aitlbd.net or dgbetar@bd.drik.net (via Alokesh Gupta, India, DXLD) Note 1230 broadcast doubled to an hour from 1200.

BELARUS Radio Minsk new address: <http://www.tvr.by> with audio files of the two weekly English and German programmes on-demand (Dietrich Hommel, Germany, *DX Listening Digest*)

BELGIUM From B-01, RVI no longer broadcasts directly from Waver, but only from relays, the end of more than half a century of SW history. We hope it will be only temporary, as there is still hope that the transmitters might be fitted for the new DRM system, Digital Radio

Mondiale. However, RTBF continues using Wavre: 100 kW on 9970. It's cheaper than Jülich. They have actually shown interest in using one of our transmitters in the future. Bit of a paradox: we are moving out, and they might move back in again. We get 500 kW from Merlin for the price of 100 kW at Jülich (Frans Vossen, RVI *Radio World*) Current RTBF transmitter is an ancient one from 1952, so hardly a surprise they are interested in taking over a RVI unit (Kai Ludwig, Germany, DXLD)

First broadcast of the day is a repeat of the previous evening's program. That's at 0400 for NAM from Bonaire on 11985; 0800 to WEU from Jülich on 5985; at 1130 to EAs from Petropavlovsk-Kamchatkiy on 9865; 1830 to SE Europe on 13710 from Jülich, 13685 from Rampisham and 9925 from Krasnodar, and MW 1512. 2030 to N&S Eu on 9925 from Krasnodar and 1512. And to NAM at 2230 from Bonaire on 13685 (Vossen, RVI RW) It took RVI-English three days to do a feature on the Sabena (SwissAir) Crisis and if you wanted hear how Belgians were affected you listened to SRI, three days before RVI reported on it (Larry Nebron, CA, *swprograms*)

BRAZIL Pirate on 7148 called "Radio P-1" ("Pe Um" in Portuguese, "Pee One" in English). Beginning at 0130 with English music, 0140 ID os with 4 watts, dipole; 0212-0230 chorinhos. Off at 0315; seems from São Paulo State or Minas Gerais State (Al Archangelo, SP, *DX Listening Digest*)

BULGARIA B-01 R. Bulgaria in English, with azimuths, all 500 kW from Plovdiv except 250 on 17500: WEU 1200-1300 15700 306, 17500 292; 2000-2100 and 2200-2300 5800 295, 7500 306; NAM 0000-0100 and 0300-0400 7400 295, 9400 206 (Ivo and Angelli, Observer)

CANADA On Oct 5, RCI decided to resume weekend newscasts by the end of that month, and to increase hours in Arabic and Russian temporarily. New feature programming lineup would begin shortly in English. But RCI's integration into the domestic CBC-French network would continue. Any good news out of RCI is almost immediately met with countering bad news. The RCI Action Committee <http://www.geocities.com/rciaction> reports five technicians have been fired from the Sockville transmitter site. This will make it impossible to continue the "buddy system" two technicians always working together in dangerous high-voltage areas. Also, four RCI employees in Montreal are being moved over to the CBC Domestic service (Sheldon Harvey, *swprograms*)

RCI's website indicates this feature schedule at 2130 and next UT day 0230: Mon. Canada in the World, Tue. Media Zone, Wed. Mailbag, Thu. Spotlight, and Fri. Business Sense. All have additional slots on weekends (Kevin Kelly, PublicRadioFan.com)

CHINA Qinghai Renmin Guangbo Diantai, frequencies not confirmed, 96 Kunlun Lu, Xining, Qinghai 810001. In Mandarin, 2220-2400 3950, 6260; 0000-0600 and 0925-1505

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; B-01 = winter season; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated

3950, 6260, 9780 (© BBC Monitoring)

Ever-expanding domestic SW schedules are compiled here, along with some live audio links, and program schedules, tnx to the Nagoya DX Circle: <http://www2.starcat.ne.jp/~ndxc/cn/cnr.htm> (gh) Thanks to leowood BCL forum, found the website <http://www.chengde-windows.com/gbdsj.gov/index.htm> regarding the broadcast media in Chengde; among the assets listed is a jamming station (Richard Lam, Singapore, DX Listening Digest)

[non] CRI in English, relays via Canada for B-01: 0100 on 9790 277 degrees; 0500 on 9560 277 degrees; 2300 on 13680 285 degrees (RCI Engineering via Bill Westenhaver)

CONGO DR Re new 100 kW transmitter, last heard on 15245: Historic frequencies include 7255, 9710, 11720, 15350 (though Nigeria is active on 7255) (Craig Seager, ARDXC)

COSTA RICA A large new antenna is being built for the RFPI 30 kW transmitter, taking up almost the whole acre yard. 7445 should have a much better signal, covering all of North America and beyond. Is two-element yagi, with special matching and tuning unit; to be placed at 200 foot level on tower, higher than the other one was, above guy cables and clear of them, avoiding pattern distortion, a previous problem. New volunteer graphic artist is designing two new QSL cards (James Latham and Joe Bernard, RFPI Mailbag)

CROATIA Hrvatski Radio heard on 8705, mix at Deanovic site of 9830 minus 1125 (Luca Botto Fiara, Italy, BDXC-UK Communication) Nat to be confused with Commanda Solol

CUBA [non] La Voz de la Fundación was canceled Sept. 21. The Cuban-American National Foundation concluded that it was not reaching Cuba effectively on SW via WHRI and WRMI, reports *El Nuevo Herald*. The final broadcast said they would be back by "other means" (Oscar, FL)

ECUADOR HCJB changes for B-01: less but better programming. Several will be shorter, but tighter, including *DX Partyline*, reduced from 50 to 30 minutes. There will be no more news on weekends. This is necessary to avoid burnout by the overworked, limited staff (Jeff Ingram and Allen Graham, HCJB DXPL)

EGYPT About the new transmitter of Radio Cairo according to Engineer Sawson Muselhi, the head of the radio engineering sector: The cost of this new station was 85 megapounds Egyptian, 500 kW, including six antennas beamed to Eu, NAM, SAm, WAF, SEAs and Au. Has four masts, and two towers with 110m height, three of 60m (Al Jamhuriya via Tarek Zeidan, SU1TZ, Egypt, BC-DX)

FINLAND YLE Radio Finland Coverage Maps (i.e. propagation forecasts) that illustrate the quality of YLE's signal, revised monthly: December: <http://www.uwasa.fi/~jpe/rfinland/dec01/> Standard disclaimer (Jari Perkiömäki, DX Listening Digest)

FRANCE Jean-Paul Cluzel, RFI director-general claims an audience of 45 megalisteners via SW, 80 FM relays, and 180 foreign stations relaying news. Also has started a 10-minute "special French" newscast of 10 minutes with a 300-word vocabulary, "Le journal en français facile" (via Benoit Marin, informations de Jean-Michel Aubier) Quand?

GEORGIA Georgian State Radio-TV has opened a website: <http://www.geotv.ge> entirely in Georgian language, with links to clips of two networks' signature tunes (Bernad Trutenau, Lithuania, MWDX)

GERMANY [non] From Oct. Eurosonor Radio in German rescheduled to 2000-2100 Sat on new 7600 via Kostinbrod, Bulgaria, 50 kW/non-directional (Ivo and Angell, Observer) But immediately changed to 7590 (Eurosonor via A-DX via BC-DX) Andreas Volk reports that Eurosonor-Radio announced on air and also claimed when asked via phone that they now use [RUSSIA] "Krasnodar 100 kW." Monitoring 7590, matches characteristics of Tbilisskaya, Russia site (Kai Ludwig, Germany, BC-DX)

GHANA R Ghana, during an unusually strong African opening, lagged the following spurs from 3366, all at intervals of 80.3 kHz from the fundamental. 3125.1, 3205.4, 3285.7, (3366), 3446.3, 3526.6, and 3606.9 (David Hodgson, TN, harmonics yahooogroup)

INDIA 5010, AIR Thiruvananthapuram, *0020 with regular interval signal and "Vande Mataram," 0035-0040 English news. People in Kerala tell me the language is Malayalam and 5010 is on only at 0020-0215, no more at 1230 for a long time (Thomas Roth, Germany, Cumbre DX)

Don't you believe AIR's own website, showing GOS English broadcasts at 0215-0400, 1530-1630 and 2315-0115 UT. Subtract 5.5 hours to get the real UT, since these are actually in local IST (gh)

INDONESIA VOI, Jakarta, 15150, 2000-2100 in English with news, commentary, music and a show of cultural interest. They gave an internet address of <http://www.rrionline.com> but could not connect; very easy to understand, good audio, very little static or fading (Keith R. Powers, KR8B, WI, DXLD)

IRAN If you're having trouble with SW audibility from VOIRI: <http://www.irib.com/worldservice/englishRADIO/default.htm> The 1100 and 1530 programs are archived for a week. Audio quality isn't the best, but 9835 isn't either at 0030 (Richard Cuff, swprograms)

[non] Voice of Mojhed heard until 1732° on 13440 with ID in Farsi, no jamming (E. Bergmann, Germany, A-DX via *Clandestine Radio Watch*)

IRAQ Radio Baghdad in Arabic 1315-1545v on new 9917.0 ex 9887.0 // 11787.0 (Ivo and Angell, Observer, Bulgaria) but was soon back on 9887.0 at 1400 (Andy Sennitt, Netherlands) Seems to jump among 9917 and 9887, previously 9687, so check them all (gh)

ISRAEL Israel Radio B-01 until March 21, 2002 in English, Eu/NAm u.o.s.:

0500-0515 9435 17545° 11605; 1130-1135 15640 17545; 1700-1730 11605 17545; 2000-2025 9435 11605 15640** 15650. Note: 6280 replaces 11605 both at 0500 and 2000 from Dec 15 to Feb 31 [sic]. *Cam/Au **Saf (via Daniel Rasenzweig, Oct 16, DX Listening Digest)

KASHMIR [non] Voice of Freedom of Jammu and Kashmir, 5101, excellent, better than Quetta 5027. English commentary daily 1400-1410. 5101 went off at 1430 and Azad Kashmir Radio came on a few minutes later on 4790, open carrier prior to audio at 1445, both believed to be the API-8 transmitter in Islamabad, Pakistan (Victor A. Gaonetilleke, Sri Lanka, UADX via BC-DX)

KOREA SOUTH [non] RKI via RCI relay B-01:
1000-1059 11715 250 kW 176 degrees LAm [presumably Spanish]
1100-1229 9650 250 kW 240 degrees USA [Korean, & English?]
0200-0259 9560 250 kW 277 degrees USA [English]

The last is RKI's very long-awaited evening relay via RCI to North America (RCI Engineering via Bill Westenhaver, Ricky Leong) RKI also rearranged webcast to include English hours at 2100, 0200, 0400 via http://www.kbs.co.kr/onair/L_RKI.asx (gh)

LAOS Vientiane, Lao National R. in English 1330-1400° on 7145, good modulation (Victor Gaonetilleke, Sri Lanka, UADX via BC-DX) Re-activation of external service, mostly news. Had been off for many years. Sounds like more than 10 kW (Craig Seager, Australia, ADXN)

MACAO [non] On 15295 at 1025 in Portuguese, several clear IDs for R. Macau, unlisted (Bob Stewart, ODXA) This certainly was RDP, Lisbon, not Radio Macau. Every hour, the news bulletins of RDP are retransmitted by Radio Macau on FM. Between the time signal and the news: "A informação na Antena 1, RDP Internacional e Radio Macau".

"Rádio Macau" is also the name of a Portuguese rock band! Probably RDP was transmitting an interview with members of the band (Fernanda de Sousa Ribeiro, Oporto, Portugal, DXLD)

MALTA [non] V of Mediterranean, B-01 in English: 1700-1730 Mon-Sat 9840 100 kW via Rome; 2000-2100 exc Fri 7440 250 kW via Moscow; 0900-1000 Sun 9840 100 kW via Rome (via Volker Willschrey, Saar)

MÉXICO Radio Educación presents armchair quality jazz at 1100-1200 on 6185, at least on Friday (Chuck Bolland, FL, DXLD)

MOROCCO Radio Medi-1, 9575, has a fine mix of music including Moroccan, international pop, French songs, especially UT Mondays from 0100 (Célio Romais, @tividade DX)

NEPAL R. Nepal again inactive on 5005. Looks like transmitter failure again, or it could be the transmitter is used on 7164.4 now which has better but still poor signal to 1715° including English news 1415 (Victor A. Gaonetilleke, Sri Lanka, UADX, via BC-DX)

NETHERLANDS Alfa Lima schedule through Feb: every weekend on 15070 AM, mostly parallel to a frequency somewhere between 6317 and 6280 kHz AM around 2230 UT Saturday evening till 0700 Sunday morning, sometimes a few hours longer. We might be there also from 1300 till 1800 Sundays. And we plan to use 21890 parallel to 15070 or 48m. <http://www.alfalima.net> Our QSL and info sheet?? Alfa Lima International, P O Box 663, 7900AR Hoogeveen, the Netherlands. enclose 1 URC/ US\$ for reply (via ACE Pirates)

[non] For B-01, RN via Sackville moves one of its new morning broadcasts one UT hour later, but not the other, i.e. 5965 to 1130-1325, but 15220 still 1430-1625. This must be because the former is simulcast with the midday European service, which unlike most other RN broadcasts, habitually makes a timeshift (gh)

NETHERLANDS ANTILLES RN Bonaire audible on 43180 at 1900, also on fundamental 21590 (Ron Trotto, IL, DX Listening Digest)

NIGERIA V. of Nigeria sent a program schedule showing three frequencies directed to different parts of Africa "and overseas" 0500-2300 on 7255 to WAF, 15120 to Eu, NAM, 11770 to CAF including English at 0500-1000, 1900-2300. 7255 kHz has been heard regularly; 11770 and 15120 have to be confirmed. Program schedule also lists 9690. Addresses: The Editor, VON Airwaves, Broadcasting House, P.M.B. 40003, Falomo, Lagos, Nigeria; by email to the editor, Mr. Tope Idowu at tidowu@yahoo.com or via fax +234-1-2691944 or tel. +234-1-269-3075 (Manfred Reiff, Germany, DX Listening Digest)

VON has quite a promotion department, but we are still waiting for decent signals on high frequencies from this station! So far there has been no sign of anything but 7255 (gh)

RN's Eric Beauchemin has visited the external service, Voice of Nigeria, which plans two additional SW transmitters on air by yearend, with a daily 18 hour service in English, and a separate 18 hour service in 5 foreign languages, also new German, Igbo & Yoruba. An internet service will start in early 2002, and streaming in RealAudio should happen by spring (© Media Network)

OMAN R. Sultanate of Oman Coverage Maps for the two English hours, updated monthly: <http://www.uwasa.fi/~jpe/rso/> Standard disclaimer (Jari Perkiömäki, Vaasa, Finland, Hard-Core-DX)

PAKISTAN PBC coverage maps for three broadcasts containing English, updated monthly: <http://www.uwasa.fi/~jpe/pbc/dec01/> Standard disclaimer (Jari Perkiömäki, Vaasa, Finland, hard-core-dx)

PERÚ On 5853.00v, Radio Americana, Nueva Cajamarca, Región San Martín until 0200°, schedule 1100-0200. Probably a new station, no mention of SW, just FM stereo: "Americana Radio está transmitiendo desde Nueva Cajamarca, Región San Martín para todo el Perú y el mundo". Has been varying 5852-5854, format the well-known greetings, music and ads (Björn Malm, Quito, Ecuador, SW Bulletin)

R. Ondas del Pacífico, Ayabaca on 13565.4 = 2 x 6782.7, at 0244 with good strength. Positive very nice slow ID given four times at 0245

Shortwave Broadcasting

via two catted announcements. Andean folk music until 0300. Even the less often heard fundamental was audible, weak. Harmonic audible again at 2230 (David Hodgson, Nashville TN, DX Listening Digest)

PHILIPPINES FEBC has stopped broadcasts in Cantonese, emphasizing Mandarin where there is stronger response (Family Bible Hour Newsletter via Hans Johnson, Cumbre DX)

Radio Veritas Asia, 31060, 2 x 15530, at 0105 in Telugu, very strong (Ian Julian, ZL1TBM, Pukekohe, New Zealand, Pacific-Rim Monitor via harmonics yahoo group)

[non] B-01 High Adventure schedule includes 1700-2000 9405 to ME/Saudi Arabia, Filipino, which must be V. of the Lord, via Germany, replacing 15750 (via Swapan Chakraborty, India, DXLD)

RUSSIA At 1040 UT one morning during disturbed propagation conditions, some low-latitude signals were fluttery, but rock-steady and totally in the clear was high-latitude Yuzho-Sakhalinsk on 11840-USB, in Russian with a dramatic reading, complemented by music. Perhaps a classic children's story, from the sound of it (Glenn Hauser, OK)

SINGAPORE Earth One, the long-delayed new station, is registered for B-01 via Merlin here, but does that mean it actually started broadcasting October 28? Don't count on it. 0100-0300 15345 at 13 degrees; 1400-1600 11865, 1600-1800 11750 1 degree, all to SE Asia with 250 kW daily (via Andreas Volk, ADDX via Wolfgang Büschel, via Alan Roe, World DX Club via Mike Barraclough)

SOMALIA Radio Banaadir, Mogadishu, in Somali 1500-2100 daily on 7002v with news around 2000 (© BBC Monitoring) Later than others until local midnight, so more DXable westward (gh)

SRI LANKA SLBC All Asia Service in English mainly targeting India uses 100 kW on 9770, 10 kW on 6005 (not 6075 as announced) and 35 kW on 15425 at 1225-1600, mostly C&W oldies, favorites of Anglo-Indian family population in Bombay and Goa; ond at 0025-0430 (Victor A. Goonetilleke, UADX, via BC-DX)

SURINAME 4990.94, Radio Apintie, 0905-0920 birthday greetings, ID, and the most doleful, dirgelike version of the Happy Birthday song I have ever heard. Powerful signal (Mark Mohrmann, VT, DX Listening Digest)

SWEDEN Radio Sweden in English works four days a week and if major Swedish news happens on a Friday, Saturday or Sunday, listen to BBC for details. The RS English Section covered the Gothenberg Riots which occurred on a Friday as a lead on their Monday program (Larry Nebron, CA, swprograms)

Radio Sweden B-01 English: Eu/Af/ME: 1430 17505; 1830 1179 and 6065 (Sundays on 5840 instead); 2030 1179, 6065, 9445; 2230 1179, 6065, 7325. As/Pac: 1330 9430, 17505; 1430 17505; 2030 9445; 0130 9495. NAM: 1230, 1330 and 1430 18960; [via Canada:] 0230 and 0330 9495 (SCDX/MediaScan) 268 and 277 degrees respectively; but also to Latin America earlier on 9495, Swedish only?, 0000 176 degrees, 0100 189 degrees (RCI Engineering via Bill Westenhaver)

SWITZERLAND SRI for B-01 no longer broadcasts to NAM or Europe; best bet is probably 2330-2400 to SA on 9885 Switzerland, 11660 French Guiana. Remaining English to Af and As, not to be concealed until 2004: 0730-0800 9885, 13635, 17665; 0830-0900 21770; 1730-1800 9605, 13790, 15555; 1930-2030 9605, 13660, 15485, 17660. Also via Merlin Singapore 1100-1200 on 9540 25 degrees to FE, incidentally toward NAM (via Andreas Volk, ADDX and Hans Weber, via Wolfgang Büschel via Alan Roe, World DX Club via Mike Barraclough).

TAJIKISTAN R. Tajikistan, 7245 at 1645 news in English, Tojik music, good here (Zacharias Liangas, Greece, DX Listening Digest) Tojik R. has a website in Dushanbe, under construction: <http://radio.tajikistan.com> Plans for audio; only in Tojik, using Cyrillic alphabet; note spelling with O's not A's (Bernd Trutenau, Lithuania, BC-DX)

TANZANIA Contrary to last month, R. Tanzania was soon back on 7280 replacing 5985. So they use two SW transmitters, one on 5050 and the other either 5985 or 7280. This second transmitter has a rather low audio level. If you can't hear R. Tanzania on SW, listen on the web at: http://dnd.ftcl.co.tz/RTD_Ratiba.html (Chris Greenway, Kenya, BDXC-UK Communication)

TUNISIA Sfax heard with soccer at 1610 on 2nd harmonics 14450, 24010 (Roberto Scaglione, BCL Sicilia)

UKRAINE RUI was thinking about using 9385 to NAM this winter, but realized some thoughtlessly-designed portables have a gap 7400-9400, so... (Alexander Yegorov, RUI via Kraig Krist, DXLD) RUI B-01 in English, one hour each: 2200 on 5905, 7240, 9560; 0100 on 7375, 7420, 9610; 0400 on 7285, 7375, 7420, 9610; 1200 on 11720, 11825, 15520. All 100 kW except 7375, 1000 kW (Alexander Yegorov, via Wolfgang Büschel via Alan Roe, via Mike Barraclough, World DX Club)

U K Outlook on BBC WS originally presented delightful light-hearted features, but no longer, remade into a "social issues" program wasting almost all its time on whatever political cause or ideological viewpoint staff wants to push on listenership. Will you change back? Or must I write this off the way BBC management wrote off shortwave listeners in North America? (William Martin, MO, to BBCWS)

Like several other major broadcasters, BBC WS quickly increased its output in Pashto and Dari after Oct. 7 (gh) Most of us do not understand Pashto, but might be interested in music, broadcast by the BBC Pashto service Fridays only, 0745-0945 on 17640 and 15380 (Frans Vossen, RVI Radio World)

[non] From B-01 Merlin schedule, BBCWS via Antigua, no longer intended for NAM, but still useful here, shows 17840 and 15220

mornings both replaced by 15190 from 1100 to 1700. 5975 for Caribbean 2100-0500, 6195 1000-1400. New frequency for BBC WS in English via WYFR, replacing 11810 & 11835, and shifting one UT hour later: 9525 0100-0400 Okeechobee 50 kW 285 degrees to CAM; and the only BBCWS via Delano frequency, also one hour later, formerly 11835 at 0300-0500 switches to: 6135 0400-0600 250 kW, 121 degrees to CAM. Note: no part of Central America is 285 degrees from Okeechobee, but Mexico is (analysis by gh from schedule via A. Volk, ADDX via Wolfgang Büschel, via Alan Roe, World DX Club via Mike Barraclough)

U S A New VOA Director is Robert R. Reilly, appointed by president in Oct. Mr. Reilly is not a stranger to VOA. For the past 11 years he has worked in the VOA building for the Office of Policy of the International Broadcasting Bureau, VOA's parent agency. Mr. Reilly is host of the On the Line program produced by the Office of Policy, and he has been the announcer who reads most of the editorials on VOA that reflect the views of the U.S. government. Many VOA employees have misgivings about a new VOA director whose background is policy advocacy rather than news (Kim Elliott, VOA Communications World) According to Bill Saffire's column, this is the guy that Phil Gramm was pushing the White House to nominate, not good news for those who feel that the VOA should be true to its charter (John Figliozzi, swprograms)

Fritz Layer in Indiana reports hearing the new "Good News Radio" with low power on 7355 at 2300-2400, previously WRNO New Orleans (AWR Wavescan) Also here, very poor modulation mixing with presumed WWL (gh, OK) WWL/WRNO mix on 6524.3 (7394.3 minus 870), at 1145; only WWL audible on 6524.3 with ID; both Bro. Stair and WWL audible on 7394.3. Previously only logged on 6484.3 (7354.3 minus 870) around 2300 (David Hodgson, TN, harmonics)

WWCR continues to be uninterested in webcasting, but some programs produced there may be heard indirectly. The Old Record Shop and Ken's Country Classics are recycled (or vice-versa?) Thursdays at noon CT (1800-2000 UT) via <http://www.wrvu.org> one week also featuring Keen on Jazz during the second hour (Glenn Hauser, DX Listening Digest)

WWFV/WGTG announced it would suspend daytime broadcasts from Oct 23 for much-needed antenna and transmitter maintenance following heavy usage and three massive direct lightning strikes this summer; and some transmitters would be moved to new WWCV station in TN. Schedule reduced to 2300-0800 on 5085, 6890. And, "We are moving forward with our plans to get rid of PAY-triot programming." ("Roadranger," rec.radio.shortwave via John Norfolk)

European DX Council and WRMI invite you to listen to a special broadcast **December 12**, the centennial of the first trans-Atlantic transmission received by Guglielmo Marconi between Poldhu, Cornwall, and St. John's, Newfoundland. A clear "S" Morse-coded signal reached the other coast of the Atlantic, opening the way to a new form of communications. If a DXer had been there, he would certainly have sent his reception report and, maybe, received a confirmation from the first radio-amateur in history - the inventor of radio. EDXC and WRMI celebrate with a special multilingual broadcast produced in Europe and transmitted to the world from America. UT December 12 only: 0130-0200 9955, 0330-0400 7385, 1330-1400 15725. A commemorative QSL card will be issued. Reports to: EDXC, C.P. 18120, I-50129 Florence, ITALY or marconi2001@edxc.org (WRMI)

The B-01 private SW schedules are on the FCC web site at http://www.fcc.gov/lib/pnd/neg/hf_web/hfff0w01.txt (Jim Moats, OH, DX Listening Digest) Notes: NO listings for "WWFV" or "WWCV," just WGTG; WMLK powers now shown as 125 kW, so the 250 kW they are installing will be run at half-power; they have yet to appear on 9955 or 15265 tho the latter has been registered for some previous seasons including A-01. Shows both 9465 and 9955 at 0400-0900, 15265 at 1700-2200, all 53 degrees to zones 27, 28 and 39 (Glenn Hauser, DXLD)

25910 NBFM, Albuquerque NM, 2200-2300 UT, IDs as Newsradio 770, KKOB (not just "KOB"), local phone-in show mostly with bomb-the-terrorists comments. Signal varied from good to nil; this part of band has power limit of 100 watts authorized.

26400 NBFM, KTKA, Topeka KS, local TV newscast mostly covering Kansas City, at 2230; ID as channel 49 fits. One watt (Alan Roberts, QU, DX Listening Digest)

[non] United Methodist Church via DTK Jülich, Germany, for B-01 with azimuths: 0400-0559 9535 160, 11775 145; 1700-1859 11735 160, 13820 145 (via Kai Ludwig)

URUGUAY 22979.9 USB at 1537, R. Monte Carlo, Montevideo, 950 kHz, SW relay of news, past 1600 (Djaci Franklin da Silva, Salvador, Brazil, @tvidade DX)

VIETNAM [non] VOV relay via Canada B-01 moves from 31mb to 6175, the erstwhile BBC relay frequency abandoned July 1, and since then held with RCI programming: 0100-0459, presumably with same language rotation with English at 0100, 0230, 0330. Switches from 212 to 268 degrees at 0259 (RCI Engineering via Bill Westenhaver)

Clandestine: Radio Free Vietnam, B-01 switches to 11850 at 1400-1430 in Vietnamese (Vuong Ky-Son, Manager of RFV, via Gabriel Ivan Barrera, Japan Premium)

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

0045 UTC on 6955 USB

PIRATE: Buckwheat Radio. Twangy guitar oldies including Duane Eddy, Telstar and the Ventures. Sounds like my old 45 record collection. Announced 10 watts. SIO 353. Email: <buckwheatradio@hotmail.com> Pirate WHYP 6944 USB, 0045-0048*. Rock music to station identification. Harold Frodge, Midland, MI)

0057 UTC on 5770 USB

NICARAGUA: Radio Miskut. Closing items of talk to Latin ballads. Full station ID with call letters at 0107 over music to 0108*. (Dave Valko, PA/Cumbre DX)

0145 UTC on 7160

ALBANIA: Radio Tirana. Very good signal for English frequency schedule. Review of Albanian Press segment to political news update. (William McGuire, Cheverly, MD)

0200 UTC on 11700

BULGARIA: Radio Bulgaria. Station interval signal to ID, frequency quote and national news. (McGuire, MD) Bulgarian pop/folk music program 11900, 2123-2130+. (Frodge, MI)

0200 UTC on 9525

CANADA: Voice of Vietnam relay. Interval signal to ID and national news. (McGuire, MD) Home service 5925 at 2035. (Bernardini, Italy/Hard-Core-DX)

0220 UTC on 9475

EGYPT: Radio Cairo. Update on Afghanistan. Frequency significantly better than 9900 (David W. Weronka, Benson, NC) 2137-2203+, report on WTC to Arabic music and Sports Roundup past 2200. Very muted/tough copy. SIO=433. (Frodge, MI) Travelogue segment, Tourism in Egypt 9900 at 2220. (Bob Fraser, Cohasset, MA)

0230 UTC on 9570

HUNGARY: Radio Budapest. English service of IDs to report on recruiting for the Hungarian Army and UNESCO. I was tuning for Radio Romania and discovered Budapest here instead. Their web page does not list this English transmission. (Lee Silvi, Mentor, OH; McGuire, MD)

0300 UTC on 13675

UNITED ARAB EMIRATES: Emirates Radio. Presumed Arabic service with regional music. English commencing at 0330, Zionism Unmasked discussing South Africa. Abrupt sign-off 0347, // 15400. (Silvi, OH, Mc Guire, MD) UAE's World Beacon 15365 at 2030 with ID and transmission details. (Paul Ormandy, Oamaru, New Zealand/HCDX) 15365 at 1825 with religious format. (Sam Wright, Biloxi, MS)

0450 UTC on 6303.7

PIRATES (EURO): Dutch Relay Service. Tentative log, noted under static with fragments of music disturbed by interference. Additional Euro's noted as; Radio Cassanova 6240.5 at 0510 with German and Dutch folk music; Radio Borderhunter 6210 at 0530 with fair signal. (David Hodgson, TN/SW Pirates Group)

0920 UTC on 4795

BRAZIL: Radio Difusora. Religious programming with SINPO 44333. Brazil's Radio Difusora 5055, 0925-0933. Radio Relogio 4095, 2301 with greetings chat to "Radio Relogio Federal 4905 kilohertz Rio de Janeiro, Brasil". (Arnaldo Slaen, Buenos Aires, Argentina). Radio Aparecida 0120 on 6135; Radio Educacao Rural 0245 on 4754.9. IDs to Braz pops and sports chat. Radio Brasil Central 0625 on 4985 // 11815. (Frank Hillton, Charleston, SC)

0930 UTC on 4877

BOLIVIA: Radio La Cruz del Sur. Sign-on identification to religious programming in Spanish/Aymara. Bolivian's audible; Radio San Gabriel 6085, 0941-0945; Radio San Miguel 4926 at 0950; Radio Pio XII 5952, 1101-1010; Radio Yura 4716.8 at 2252. (Slaen, ARG)

1011 UTC on 6155

URUGUAY: Radio Sarandi del Yi. Special transmissions of equestrian competitions to advertisements too "se comunica a...que su caballo perdio la herradura...". Station identification with medium wave frequency quote included. SODRE 9620.8 at 1340 // with 650 AM kHz. Programming of Concert # 1 of Chopin. SINPO 34343. (Slaen, ARG)

1119 UTC on 2310

Australia: ABC NT Service (Alice Springs) U.S. pop tunes with fair-poor signal quality. ABC NT Svc-Tennant Creek audible 2130 on 4910 with regional news. (SIPO 24332) (Bernardini, Italy/HCDX) Radio Australia 15240, 0620 with IDs. (Tom Banks, Dallas, TX) Radio Australia 11650, 1428-1501+, /// 9580. (Frodge, MI) 1200 on 9580. (Fraser, MA)

1515 UTC on 17720

CHINA: China Radio Int'l. Text on anniversary of Japan/China interaction. Update on Taliban's terms of Bin Laden. Sports roundup on soccer in China. (Howard Moser, Lincolnshire, IL)

1705 UTC on 15365

Radio Romania Int'l. Newscast to 1710 then commentary on war on terrorism. Noted on 11940 at 2120 with more news and commentary. (Frodge, MI) ID and frequency schedule to national news. (McGuire, MD) Audible 11775, 2300-2359 excellent signal noted to Europe. (Silvi, OH) Spanish service 15365, 0300. (Weronka, NC)

1756 UTC on 12689.5 USB

USA: Armed Forces Radio. ID, "you're listening to AFN". CBS news relay at 1800 & a900 then AFRTS News Update. US Radio Sports at 1823 & 1923. Pop music and not-so-oldies tunes. No other AFN freqs noted. (Frodge, MI)

1925 UTC on 4890

PAPUA NEW GUINEA: (Papua) NBC. Papuan music to regional news at 2000 including identification. (Bernardini, Italy/HCDX) PNG's audible; Radio Enga (New Guinea) 1120 on 2410 with Pidgin chat to indigenous vocal music. New Guinea-Radio Sandaun 3205 at 1143-1210* with national anthem; Papua-Radio South Highlands 1125 on 3275; Admiralty Islands-Radio Manus 1210 with English talk and news on 3315. (Duane Hadley, Bristol, TN)

2005 UTC on 13730

IRAN: VOIRI. Talk on "repentance and forgiveness". Interview with an unnamed American with anti-Israeli slant. (Moser, IL). News & Views with interviews // 9022, 11625. (Fraser, MA)

Audible 15084, 2025-2033+, instrumental music to announcer's local language. (Frodge, MI)

2145 UTC on 4753.2

INDONESIA: RRI-Makassar. Indonesian service of local chat, program line-up format to regional music. SINPO 23322. RRI-Jambi 4925 at 2156. (Bernardini, Italy/HCDX) Voice of Indonesia 1740-1755 on 15150 with Indo vocal music to lady announcer's text. SIO=333. (Bill Flynn, OR/Cumbre DX)

2200 UTC on 11845

TURKEY: Voice of Turkey. Freq quote to Euro news 2202-2210. Review of the Turkish Press to interval signal and ID. Audible 2214-2248* on 7190. News of politics in Ankara to Turkish Album. VOT identification to Turkish music, // 11845 SIO=544. (Frodge, MI) Blue Voyage segment 11845 at 2214. (Fraser, MA)

2220 UTC on 6294.06

PIRATES (EURO): Mike Radio. Fair signal for SINPO 34333, switching to lower sideband to upper sideband to avoid teletype interference. Radio Aquarius 2309-2336 & 2352-0011 on 6304.98. SINPO 24332 with RTTY interference. ID "Gronau" with mention of location to 0011*. Reflections Europe 2303.2 on 6295.01 with religious text. (Jean Burnell, St. John's, Newfoundland, Canada/SW Pirates Group)

2315 UTC 6890

USA: WWFV. American Dissident Voices segment with anti-Jewish tirade, 12172 at 2105. USA stations heard; WEWN 11875, 1708-1723+ with Catholic World Today; Radio Mari 13630, 1702-1707+, 11775, 1639-1650+; VOA 15580, 1815-2019+. WSHB 18910, 1715-1750+; WYFR 18930 at *1700(Frodge, MI; Sue Wilden, Noblesville, IN)

Thanks to our contributors - Have you sent in YOUR logs?
Send to Gayle Van Horn, c/o Monitoring Times (or e-mail
gayle@webworkz.com)

English broadcast unless otherwise noted.

LowFERS and MedFERS...a winter pursuit

Popular Electronics once called it, "the most unusual ham frequencies you can explore," while the *Longwave Club* says it is, "not for the faint-hearted."

Low Frequency Experimental Radio, and Medium Frequency Experimental Radio, consist of stations unlicensed but legal and not regulated by the FCC under Part 15. These two provisions allow the use of 1 watt of power between 160-190 kHz in the long wave bands, and from 510-1705 kHz in the medium wave band. Hobbyists, depending on which bands they utilize, are called LowFERS, MedFERS or both.

LowFERS are experimental beacons on 24 hours, sending their call in very slow Morse code, repeating continuously. Some experimenters are amateur radio operators, although it is not required. MedFERS also use slow speed Morse Code for identifications.

The optimum listening opportunity is winter, when static levels are at a minimum and propagation is usually stable. LF and MF hobbyists may hear signals from a few miles to several hundred miles during prime listening periods.

Most LF and MF stations welcome reception reports and will confirm readily. Verifications require a prepared QSL card or form letter, return mint postage and an SASE. Taped reports have proven successful.

To learn more on experimenting with the LowFERS and the MedFERS, QSLing trends and more, go to the Longwave Home Page <http://www.lwcaorg/index.htm> or *The Master List of Part 15 Radio Stations of North America* <http://home.att.net/weatheradio/part15.htm>.

ASCENSION ISLANDS

RAI Int'l relay 15320 kHz. No data QSL card unsigned, plus station stickers. Received in 352 days for an English report and souvenir postcard. Station address: P.O. Box 320, Correspondence Sector, 00100 Rome, Italy. (Bill Henderson, Portland, OR)

EQUATORIAL GUINEA

Radio Africa, 15185 kHz. QSL card and verification letter signed by Andrea Palomo, plus religious brochure and schedule. Received in 45 days for an English report. QSL address: Pan American Broadcasting, 20410 Town Center Lane, Suite 200, Cupertino, CA 95014. Station address: P.O. Box 851, Malabo, Equatorial Guinea, Africa. (Juan Antonio Arranz Sanz, Spain/HCDX)

INDIA

All India Radio-Srinagar, 4950 kHz. Full data QSL signed by A.K. Bhatnagar. Received in 55 days for an English report. Verified direct from New Delhi headquarters. Station address: Director of Frequency Assignments, All India Radio, Room 204, Akashwani Bhawan, Parliament St., New Delhi 110001, India. (Daniele Canonica, Muggio, Switzerland) reports may also be sent to regional stations with minimal success. Return postage is not required. - ed.

MEDIUM WAVE

NSW-2RF Griffith, Australia. Full data QSL card signed by John Wright. Noted station is 400 watts. Received in 17 days for an AM report. Station address: 4133 Kerrie Crescent, Peakhurst NSW 2210, Australia. Aussie QSL # 220. (Patrick Martin, Seaside, OR)

CJBKK, 1290 AM kHz. No data station QSL card unsigned. Received in 45 days for an AM report. Station address: 743 Wellington Rd., South London, Ontario N6C 4R5 (Charles D. Harrington, PA)

WCOJ, 1420 AM kHz. Full data QSL card signed by QSL Manager. Received in 10 days for an AM report. Noted QSL Manager is a volunteer and requires an SASE for QSL response. Station address: P.O. Box 56, Westtown, PA 19395. (Harrington, PA)

WEVD, 1050 AM kHz. Full data QSL card signed by Chief Engineer. Received for an AM report. Engineer states that the station recently installed a new transmitter. Station address: 333 7th Ave., New York, NY 10001. (Harrington, PA)

MONGOLIA



Voice of Mongolia, 12015 kHz. Full data QSL card signed by A. Zaya, plus program guide and airline schedule. Received in 140 days for an English report. Station address: C.P.O. Box 365, Ulaanbaatar 13, Mongolia. (Sanz, Spain/HCDX) www.mongol.net/vom

NETHERLANDS ANTILLES

Radio Netherlands relay, 11865 kHz. Full data Oat Field card unsigned. Received in three weeks for an English report and two IRCs. Station address: P.O. Box 222, 1200 JG Hilversum, The Netherlands. (Bill R. Wilkins, Springfield, MO)

NEW ZEALAND

Radio New Zealand Int'l, 17675 kHz. Full data unsigned QSL card plus station stickers and program schedule. Received in 148 days for an English report. Station address: P.O. Box 123, Wellington, New Zealand. (Joe Squashic, Wake Forest, NC)

PAKISTAN

Radio Pakistan, 17660 kHz. Full data scenery card unsigned plus station stickers and brochure. Received in two months for an English report and two IRCs. Station address: P.O. Box 1393, Islamabad 44000, Pakistan. (Brian Bagwell, St. Louis, MO) <http://www.radio.gov.pk> Email: cnoradio@isb.comsats.net.pk -ed.

PIRATE

Alfa Lima Int'l, 15070 kHz. Full data info sheet and skull card signed by Alfred. Received in two weeks for an English report, one IRC and souvenir postcard. Station address: P.O. Box 663, 7900 AR Hoogeveen, The Netherlands. (Wilkins, MO) Telephone/

Hotline: +31 6 19508938

RUSSIA

Doma Radio, 6235 kHz. Full data QSL card signed by Dmitry Vasylijev-SW Project Manager. Received in 30 days for an English report. Station address: Ligovsky Prospect 174, St. Petersburg, 192007 Russia. (Canonica, SU)

TRAVEL INFORMATION STATIONS

1610 TIS MT, Grant-Kohrs Ranch National Historic Site. Received verification letter signed by Scott Eckberg-Chief Ranger, for 10 watt transmitter. Received in 14 days for a taped report. Station address: P.O. Box 790, Deer Lodge, MT 59722. MT QSL # 43. (Martin, OR)

1630 TIS CA, Arcata, CA. Received verification letter signed by Russ Lee-Traffic Operations. Noted they were testing on 1630, now on 1610 AM. Received in three days for a report. Station address: State of California, Dept. Of Transportation, 1656 Union St., P.O. Box 3700, Eureka, CA 95502-3700. (Martin, OR)

UNITED STATES

WBCQ-The Planet, 9330 kHz. Full data QSL card signed by Alan Weiner. Received in 30 days for an English report. Station address: 97 High St., Kennebunk, ME 04043. (Frank Hillton, Charleston, SC)

WRMI-Radio Miami Int'l 7385 kHz. Full data QSL card signed by Jeff White-General Manager, plus sticker and program schedule. Received in 182 days for an English report. Station address: 175 Fontainebleau Blvd., Suite 1N4, Miami, FL 33172. (Squashic, NC)

WTJC, 9370 kHz. Two full data QSL cards signed by A. Robinson. Received in seven and 15 days. Station address: Fundamental Broadcasting Network, 520 Roberts Rd., Newport, NC 28570. (Sanz, Spain/HCDX)

Listening to the Tea Leaves

The continuing crisis spawned on September 11 has highlighted, once again, shortwave's utility as an information source during global and regional emergencies. Times like these starkly reveal all that we don't know, driving many of us to place a premium on learning all we can.

The goals of the SWL are simple: to increase one's exposure to an ever-wider range of perspectives and to separate fact from fiction. Here is my approach toward pursuing these objectives. Two disclaimers: (1) All perspectives are valuable in some way, so all stations have some value in this regard even though they may not be cited here; and (2) Don't assume that I use all of these sources on a daily basis. No one has that much time. (*Use MT's Shortwave Guide to find frequencies for the broadcasts cited here.*)

◆ Reference Points

If one is to listen intelligently, he or she must have accurate reference points. Shortwave is not the only tool I use; I still find that newspapers and magazines offer far more background information than any other source. The Internet http://dir.yahoo.com/News_and_Media/News-papers/ makes thousands of these available from around the world at the click of a button. For the current crisis, my bellwethers have been: *The New York Times*, *The Washington Times*, *The Washington Post*, *The Guardian*, *The Daily Telegraph*, *The Dawn* (a Pakistani English language daily), *The South China Morning Post*, *The Sydney Morning Herald*. I find a reasonable degree of ideological and regional diversity in this list.

As for radio, of course I regularly listen to the **BBC World Service**, which has greatly expanded its (thankfully still) excellent news programming and, despite the annoying loss of frequencies and its stubbornly myopic management, can still be heard almost around the clock – albeit with more effort than should be necessary. One should avoid over-reliance on one source, however. In this regard, I like **RCI's This Morning** (M-F 1405) and *As It Happens* (M-F 2330), **Deutsche Welle's Newslink** (T-A 0105, 0305, 0505), **R. Australia's Asia Pacific** (M-F 1005, 1105, 1505, 2305) and **RNZI's Checkpoint** (M-F 0405). The reporting on these programs is sufficiently “detached” and “open-minded” to serve as a useful means of making an initial determination about what might be factual. However, I doubt it is humanly impossible for any report to be completely devoid of bias. Therefore, it is best to compare what one hears from various sources – even generally reliable ones – before forming judgments about veracity.

◆ Other “Detached” Sources

There is another set of news programs from stations that can increase perspective by either reinforcing or challenging what is being generally

reported by those cited above. However, in my assessment, these stations do not own enough of a reputation for accuracy and objectivity to permit them to be used in quite the same way. I am referring here to the **Voice of Russia** (hourly newscasts [0200-0500] and *News and Views* [T-S 0411]) and **China Radio International** (*News and Current Affairs* during the first half-hour of all weekday broadcasts), both of which originate from important nations that clearly have something to say about events of any magnitude.

Interestingly, **Radio Habana Cuba** (0000-0700UT broadcast to North America), perhaps due to its proximity to the US and having keenly felt the consequences of US foreign policy, has a penchant for making some thought-provoking observations about the use and utility of military and economic power.

◆ Active Listening

It has been my experience that even stations located in or near a “hotspot” rarely appear to “lie” in the absolute sense of that word. Rather, I would describe what goes on as “spin doctoring” the available facts. Some things – whether they be events, statements or statistics – get great emphasis, while others get little or less prominent mention. This, of course, is the essential task of the propagandist: to create a particular impression in the mind of the listener. Too direct an approach inspires only disbelief and rejection in the listener.

It is important to note that not all of this effort necessarily arises out of a conscious desire to deceive. Deeply held beliefs generate and reinforce certain preconceptions and biases. We also are not immune.

“Active” listening – that is, analyzing the content of broadcasts by applying relevant context, whether this be known preconceptions or things learned and confirmed by other sources – reveals things to the prepared listener that go unnoticed by the casual listener. One is reminded of the maxim: “what is unsaid often can be more revealing than what is said.” The order of the reports in a newscast, the choice of words within a report, the number of times a theme is repeated over a period of time, the absence of a report on a known event, a blatant inaccuracy – even the length or brevity of a given report – all can say more to the “active” listener than the literal text of actual broadcasts. The active listener is attempting to read between the lines – to listen to the tea leaves, as it were – to gain a deeper insight.

A good example of this emerged as this column was being written. The *New York Times* prominently reported the statements of a former high Kuwaiti official criticizing his own government for what he saw as its tepid support for U.S. efforts against terrorism. This was an extraordinary, groundbreaking statement. Therefore it was not surprising that a **R. Kuwait** newscast later the same day failed to mention it. The Kuwaiti government clearly did not want to address

this issue publicly. But in future monitoring, I will be alert as to whether **R. Kuwait** or any other Mideast station introduces this perspective to its listeners.

◆ Closer-In

Currently, I am regularly monitoring the newscasts (at these times) of **R. Pakistan** (1055), **R. Kuwait** (1815), **R. Damascus** (2010 or 2110), **Voice of Turkey** (2300), **R. Cairo** (0215), **Voice of the Islamic Republic of Iran** (0035), **UAE R. Dubai** (0330) and **Kol Israel** (0500), since these are what I can regularly hear in upstate New York at times usually convenient for me. I also try, but without much recent success, to hear **R. Jordan**, **Oman**, **All India R.**, **Voice of Indonesia**, **Voice of Malaysia**, **R. Singapore International**. I am keeping a log of what these newscasts are reporting and, from time to time, am posting these reports along with my observations and impressions to the *MT* Chat Board, swprograms list and other listener forums. Keeping records of these newscasts produces an interesting timeline, showing how particular reports or stories develop and revealing trends in the various approaches taken by different stations. Reviewing this log periodically gives me additional perspective that can further enhance my efforts at active listening.

◆ What about the VOA?

By now you know of the pressure that has been applied to the **Voice of America** by the State Department and some pundits, calling for it to “support” Washington's views and policies even to the point of “spin-doctoring” its news reporting. Those who ask for this demonstrate their lack of understanding of the VOA and its charter and the importance of the service's hard won reputation for integrity and reliability. It is the VOA's credibility that makes it such an effective communications source.

To its credit, the VOA has resisted this effort and nearly every U.S. newspaper editorial has supported the continued independence of VOA news gathering and reporting activities. In fact, it's quite possible that the VOA has received more domestic publicity over this skirmish than at any other time in its history.

Even battered and impoverished populations like those in Afghanistan can tell when they are being told the truth or are being propagandized. The quickest route to destroying the VOA's influential role with Afghans and others as a respected source for badly needed accurate information would be for the VOA to follow the State Department's wishes.

VOA News Now is part of my regular listening – as it is for millions around the globe – and will remain so as long as it continues to resist the entreaties of those who would make it solely the voice of our own “spin doctors.”

HOW TO USE THE SHORTWAVE GUIDE

0000-0100 twrfa 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 Standard Time) 5, 6, 7, or 8 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 page.

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, 7:30 pm Eastern, 6:30 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

In the same column ⑥, 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 ⑦ 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, inter-

ference, 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 ⑧ 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
 om: omnidirectional
 pa: Pacific
 sa: South America
 va: various

Choose a program or station you want to hear.

Selected programs for prime listening hours appear following the frequencies – space does not permit 24 hour listings nor can every station be listed. However, listings for the most popular stations and selected lesser-known stations illustrate the variety available on shortwave. The format of the listings alternates among three different styles – by station, by genre and by day – month by month. Times listed are approximate and programs are subject to change.

The program listings emphasize broadcasts targeted to North America. In most cases, the stations and programs listed should be readily receivable in North America using a portable radio. Most broadcasters produce one broadcast in English per day that is repeated over a 24 hour period to all areas. If you are able to listen to transmissions to other areas of the world during "non-prime time" hours, referring to the prime time listings for those stations will likely be helpful in determining what programs will be broadcast.

Occasionally, a program or station listing may be followed by a reference to another listing for the same program or station at a different time. This is done to conserve space and make it possible to provide more listings.

MT MONITORING TEAM

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Program Highlights

John Figliozzi

Holiday Season Programs

Rest assured, there will be a wealth of offerings on nearly every transmitter. Here are a few notable expectations:

The **BBC World Service** has two traditions: *The Festival of Nine Lessons and Carols* and *The Queen's Christmas Message*. Hear some seasonal stories from *Off the Shelf* (M-F1445, T-A0445) and performances with a Holiday theme on *Play of the Week* (S 0005) and *Concert Hall* (S1601). There will be others.

A newer radio tradition is preserved by **CBC's As It Happens** (M-F 2330-0100), heard via **RCI**. The late Alan Maitland – a much-loved longtime co-host, under the alter-ego "Fireside Al" – began the practice of reading seasonal poems and stories each night on the days leading up to Christmas and Hannukah, culminating in "The Shepherd," a beautiful – if unusual – Christmas story. Through the miracle of sound recording, Fireside Al still reads each year. On Christmas Eve, the program is given over to the greetings of Canadian armed forces personnel stationed overseas to those back home. This program undoubtedly will have special poignancy this year. Also, **CBC North Quebec** on 9625 kHz, relays the entirety of **CBC Radio One's** always fine special day schedules depicting the ways Canadians celebrate Christmas and New Year's days.

Deutsche Welle's German service (just tune around) suspends its regular schedule and broadcasts a wide variety of seasonal music, performances and religious services on Christmas Eve Day, Christmas, December 26 and New Year's. **DW's** English service, **R. Netherlands**, **R. Sweden**, **R. Prague**, **YLE Radio Finland**, **R. Austria International** and **R. Budapest** annually broadcast special programs about local traditions. **Vatican Radio** and **WEWN** will carry Catholic services and sentiments. **HCJB** Ecuador always schedules something compelling – a 1939 radio production of "A Christmas Carol" was broadcast last year. **R. Australia** and **RNZI** will offer Christmas from a down-under perspective. **Kol Israel** will observe Hannukah.

However you celebrate the Season, may it be safe and joyous!

(A final suggestion: use **MT's** time and frequency list to ring in the New Year as it arrives around the world.)

0000 UTC - 7PM E / 6PM C / 4PM P

0000	0015	Cambodia, National Radio Of	11940as				
0000	0015	Japan, Radio	6145na	13650pa	17810pa		
0000	0030	Australia, Radio	9660pa	12080pa	15240as	15415as	17580pa
		17775as 17795va	21740va				
0000	0030	Egypt, Radio Cairo	9900am				
0000	0030	Thailand, Radio	9690va				
0000	0030	UK, BBC World Service	3915as	5965as	5975am	6195as	7105as
		9410me 9590am 9915sa	11810as	11945as	11955sa	12095as	
		15280as 15310as 15360as	17615as	17790as			
0000	0045	India, All India Radio	9705as	9950as	11620as	12605as	
0000	0056	North Korea, Voice of Korea	4405va	11460na	11710na		3760na
		15180na					
0000	0057 as	Canada, Radio Canada Intl	9750as	11895as			
0000	0059	Canada, Radio Canada Intl	5960am	6175am	9590am		9755am
0000	0100	Anguilla, Caribbean Beacon	6090am				
0000	0100	Australia, ABC/Alice Springs	4835do				
0000	0100	Australia, ABC/Katherine	5025do				
0000	0100	Australia, ABC/Tennant Creek	4910do				
0000	0100	Bulgaria, Radio	7400na	9400na			
0000	0100	Canada, CBC Northern Service	9625do				
0000	0100	Canada, CFRX Toronto ON	6070do				
0000	0100	Canada, CFVP Calgary AB	6030do				
0000	0100	Canada, CHNX Halifax, NS	6130do				
0000	0100	Canada, CKZN St John's NF	6160do				
0000	0100	Canada, CKZU Vancouver BC	6160do				
0000	0100	Costa Rica, R for Peace Intl	15045va	15040al	21815usb		
0000	0100	Costa Rica, University Network	5030am	6150am	7375am		9724sa
		11870am 13749na					
0000	0100	Ecuador, HCJB	11785as				
0000	0100	a/monthly Finland, Scandv Weekend Radio	5980va	11720va			
0000	0100	Germany, Voice of Hope 6040as					
0000	0100	Guyana, Voice of	3290do	5950do			
0000	0100	Japan, Radio	6145na				
0000	0100	Malaysia, Radio	7295do				
0000	0100	Malaysia, RTM Kota Kinabalu	5980do				
0000	0100	Malaysia, RTM Sarawak 7160do					
0000	0100	Namibia, Namibian BC Corp	3270of	3289of			
0000	0100	Netherlands, Radio	9845na				
0000	0100	New Zealand, Radio NZ Intl	17675pa				
0000	0100	Papua New Guinea, NBC	9675do	11880irr			
0000	0100	Singapore, SBC Radio One	6150do				
0000	0100	Solomon Islands, SIBC	5020do	9545do			
0000	0100	South Korea, Radio Korea Intl	9750na				
0000	0100	Spain, Radio Exterior Espana	6055na				
0000	0100	USA, Armed Forces Radio	6458usb	12689usb			
0000	0100	USA, KAU Dallas TX	5755va				
0000	0100	USA, KTBN Salt Lake City UT	7510na				
0000	0100	USA, KWHR Naalehu HI 17510as					
0000	0100	USA, Voice of America 5995am	6130am	7405am	9455am	9775am	
		11695am 13740am					
0000	0100	USA, WBCQ Monticello ME	7415na	9335na	17495na		
0000	0100	USA, WEWN Birmingham AL	5825na	9355na	15745na		
0000	0100	USA, WHRA Greenbush ME	7580eu				
0000	0100	USA, WHRI Noblesville IN	5745va	7315am			
0000	0100	USA, WINB Red Lion PA 12160am					
0000	0100	USA, WJCR Upton KY 7490am	13595as				
0000	0100	USA, WRMI Miami FL 9955sa					
0000	0100	USA, WRNO New Orleans LA	7355am				
0000	0100	USA, WSHB Cypress Crk SC	7535am	9430am	15285sa		
0000	0100	USA, WTJC Newport NC 9370na					
0000	0100	USA, WWBS Macon GA 11900na					
0000	0100	USA, WWCR Nashville TN	3215na	5070na	7435na	13845na	
0000	0100	USA, WWFV McCaysville GA	6890va	9320va	12172va		
0000	0100	USA, WYFR Okeechobee FL	6085na	9505na	15130na		
0000	0100	Vanuatu, Radio	3945do	4960do	7260do		
0000	0100	Zambia, Christian Voice 4965do					
0025	0100	Sri Lanka, SIBC	6005as	9770as	15425as		
0030	0100	Australia, Christian Voice	21680as				
0030	0100	Australia, Christian Voice	17775as	17850pa			
0030	0100	Australia, Radio	9660pa	12080va	15415as	17580pa	
		17750as 17755as 17795va	21740va	9022am	9835am	11970am	
0030	0100	Iran, VO Islamic Rep. of Iran					
0030	0100	Lithuania, Radio Vilnius 9875na					
0030	0100	Thailand, Radio	13695na				
0030	0100	UK, BBC World Service	5965as	5975am	6195as	7105as	9410me
		9590am 9915sa 11810as	11955sa	12095as	15280as	15360as	
		17790as					
0030	0100	USA, Voice of America	7215as	9770as	11760as	15185as	15290as
		17740as 17820as					
0030	0100	Yugoslavia, Radio	11870am				
0045	0100	Pakistan, Radio	11650as	12050as	15455as	15600as	
0045	0100	USA, WYFR Okeechobee, FL	15130na				
0050	0100	UK, International BC Tamil	11570as				
0055	0100	Italy, RAI International	9675na	11800na			

0100 UTC - 8PM E / 7PM C / 5PM P

0100	0115	Italy, RAI International	9675na	11800na			
0100	0115	Pakistan, Radio	11650as	12050as	15455as	15600as	
0100	0125	Netherlands, Radio	6165na	9845na			
0100	0127	Czech Rep, Radio Prague Intl	6200na	7345na			
0100	0127	Vietnam, Voice of	6175na				
0100	0130	Australia, Christian Voice	17775as	21550pa	21680pa		
0100	0130	Germany, Universal Life	9435as				

0100	0130	Germany, Voice of Hope 6040as	9022am	9835am	11970am		
0100	0130	Iran, VO Islamic Rep. of Iran	5930na	7230ca	9440sa		
0100	0130	Slovakia, Radio Slavckio Intl	6130am	7405am	9455am		9775am
		USA, Voice of America 5995am					
		13740am					
0100	0130	Uzbekistan, Radio Tashkent	7190as	9375as	9530as	9715as	
0100	0145	Germany, Deutsche Welle	6040na	9640am	11810na	13720am	
0100	0145	USA, WYFR, Okeechobee FL	15130na				
0100	0156	North Korea, Voice of Korea	3560va	11734va	15230va	17735va	
0100	0200	Anguilla, Caribbean Beacon	6090am				
0100	0200	Australia, ABC/Katherine	5025do				
0100	0200	Australia, ABC/Tennant Creek	4910do				
0100	0200	Australia, Radio	9660pa	15240as	15415as	17580pa	
		17750as 17755as 17795va	21725pa				
0100	0200	Canada, CBC Northern Service	9625do				
0100	0200	Canada, CFRX Toronto ON	6070do				
0100	0200	Canada, CFVP Calgary AB	6030do				
0100	0200	Canada, CHNX Halifax, NS	6130do				
0100	0200	Canada, CKZN St John's NF	6160do				
0100	0200	Canada, CKZU Vancouver BC	6160do				
0100	0200	China, China Radio Intl 9580na	9790na				
0100	0200	Costa Rica, R for Peace Intl	15045va	15040al	21815usb		
0100	0200	Costa Rica, University Network	5030am	6150am	7375am		9724sa
		11870am 13749na					
0100	0200	Cuba, Radio Havana	6000na	9820na	11705usb		
0100	0200	Ecuador, HCJB	9745na	11840na	21455usb		
0100	0200	Finland, Scandv Weekend Radio	5980va	11720va			
0100	0200	Guyana, Voice of	3290do	5950do			
0100	0200	Indonesia, Voice of	9525as	11785as			
0100	0200	Japan, Radio	11860pa	11870me	11880me	15325as	17685pa
		17810as 17835sa	17845as				
0100	0200	Malaysia, Radio	7295do				
0100	0200	Malaysia, RTM Kota Kinabalu	5980do				
0100	0200	Namibia, Namibian BC Corp	3270of	3289of			
0100	0200	New Zealand, Radio NZ Intl	17675pa				
0100	0200	Papua New Guinea, NBC	9675do	11880irr			
0100	0200	Singapore, SBC Radio One	6150do				
0100	0200	Solomon Islands, SIBC	5020do	9545do			
0100	0200	Spain, Radio Exterior Espana	6055na				
0100	0200	Sri Lanka, SIBC	6005as	9770as	15425as		
0100	0200	UK, BBC World Service	5965as	5975am	6195as	9410as	9590am
		9915sa 11835as 11955sa	12095as	15280as	15310as	15360as	
		17790as					
0100	0200	Ukraine, Radio Ukraine Intl	7375eu	7460as	9610as		
0100	0200	USA, Armed Forces Radio	6458usb	12689usb			
0100	0200	USA, KAU Dallas TX	5755va				
0100	0200	USA, KTBN Salt Lake City UT	7510na				
0100	0200	USA, KWHR Naalehu HI 17510as					
0100	0200	USA, Voice of America 7115as	9635as	11705as	11725as		
		13650as 15250as 17740as	17820as				
0100	0200	USA, WBCQ Monticello ME	7415na	9335na	17495na		
0100	0200	USA, WEWN Birmingham AL	5825na	9355na	15745na		
0100	0200	USA, WHRA Greenbush ME	7580eu				
0100	0200	USA, WHRI Noblesville IN	5745va	7315am			
0100	0200	USA, WINB Red Lion PA 12160am					
0100	0200	USA, WJCR Upton KY 7490am	13595as				
0100	0200	USA, WRMI Miami FL 9955sa					
0100	0200	USA, WRNO New Orleans LA	7355am				
0100	0200	USA, WSHB Cypress Crk SC	7535am	9430am	15285sa		
0100	0200	USA, WTJC Newport NC 9370na					
0100	0200	USA, WWBS Macon GA 11900na					
0100	0200	USA, WWCR Nashville TN	3215na	5070na	5935na	7435na	
0100	0200	USA, WWFV McCaysville GA	6890va	9320va	12172va		
0100	0200	USA, WYFR Okeechobee FL	6065na	9505na	15060as		
0100	0200	Vanuatu, Radio	3945do	4960do	7260do		
0100	0200	Zambia, Christian Voice 4965do					
0105	0110	Croatia, The Voice of Croatia	992				

Shortwave Guide



0200	0300	17580va 17750as 21725va					
0200	0300	Canada, CBC Northern Service	9625da				
0200	0300	Canada, CFRX Toronto ON	6070da				
0200	0300	Canada, CFVP Calgary AB	6030da				
0200	0300	Canada, CHNX Halifax, NS	6130da				
0200	0300	Canada, CKZN St John's NF	6160da				
0200	0300	Canada, CKZU Vancouver BC	6160da				
0200	0300	Costa Rica, R for Peace Intl	7455va	15045va	15040al		
0200	0300	Costa Rica, University Network	5030am	6150am	7375am	9724sa	
0200	0300	11870am 13749na 13749na					
0200	0300	Cuba, Radio Havana	6000na	9820na	11705usb		
0200	0300	Ecuador, HCJB	9745na	11840na	21455usb		
0200	0300	Egypt, Radio Cairo	9475am				
0200	0300	a/monthly Finland, Scandv Weekend Radio	5990va	11720va			
0200	0300	Guyana, Voice of	3290do				
0200	0300	Kenya, Kenya BC Corp	4885irr				
0200	0300	Malaysia, Radio	7295do				
0200	0300	Malaysia, RTM Kota Kinabalu	5980do				
0200	0300	Namibia, Namibian BC Corp	3270af	3289af			
0200	0300	New Zealand, Radio NZ Intl	17675pa				
0200	0300	Papua New Guinea, NBC	9675do	11880irr			
0200	0300	Russia, Voice of Russia	7180na	9725na	17595na		
0200	0300	Singapore, SBC Radio One	6150da				
0200	0300	Saloman Islands, SIBC	5020da				
0200	0300	South Korea, Radio Korea Intl	15575na				
0200	0300	Sri Lanka, SIBC	6005as	9770as	15425as		
0200	0300	Taiwan, Radio Taipei Intl	15345as	5950na	9680na	11740am	15270as
0200	0300	UK, BBC World Service	5975am	6135am	6195as	9410as	9770af
0200	0300	9915sa 11835as 11955va	12095as	15280as	15310as	15360as	
0200	0300	17790as					
0200	0300	UK, Merlin Network One	9430na				
0200	0300	USA, Armed Forces Radio		6458usb	12689usb		
0200	0300	USA, KAIJ Dallas TX	5755va				
0200	0300	USA, KJES Vado NM	7555na				
0200	0300	USA, KTBN Salt Lake City UT		7510na			
0200	0300	USA, KWHR Naalehu HI	17510as				
0200	0300	USA, Voice of America	7115as	9635as	11705as	11725as	11820as
0200	0300	13650as 15250as 17740as		17820as			
0200	0300	USA, WBCQ Monticello ME	7415na	9335na			
0200	0300	USA, WEWN Birmingham AL	5825na	9355na	15745na		
0200	0300	USA, WHRA Greenbush ME	7580eu				
0200	0300	USA, WHRI Noblesville IN	5745va	7315am			
0200	0300	USA, WINB Red Lion PA	12160am				
0200	0300	USA, WJCR Upton KY	7490am	13595as			
0200	0300	USA, WRMI Miami FL	7385na				
0200	0300	USA, WRNO New Orleans LA	7355am				
0200	0300	USA, WSHB Cypress Crk SC	5850na	7535am	9430na		
0200	0300	USA, WTJC Newport NC	9370na				
0200	0300	USA, WWCR Nashville TN	3215na	5070na	5935na	7435na	
0200	0300	USA, WWFV McCaysville GA	6890va	12172va			
0200	0300	USA, WYFR Okeechobee FL	6065na	9505na			
0200	0300	Vanuatu, Radio	3945do	4960do	7260do		
0200	0300	Zambia, Christian Voice	4965do				
0200	1215	Cambodia, National Radio Of		11940as			
0205	0210	Croatia, The Voice of Croatia		9925irr			
0215	0220	Nepal, Radio 5005os	7165as				
0230	0257	Vietnam, Voice of	6175na				
0230	0300	Albania, Radio Tirana Intl	6115na	7160na			
0230	0300	Philippines, Radyo Pilipinas	11885po	15120po	15270pa		
0230	0300	Slovakia, Adventist World Radio	7235as				
0230	0300	Sweden, Radio	9495na				
0250	0300	Vatican City, Vatican Radio	7305am	9605am			

0300 UTC - 10PM E / 9PM C / 7PM P

0300	0310	Vatican City, Vatican Radio	7305am	9605am			
0300	0330	sm w fo Belarus, Radio Belarus Intl	6070eu	7210eu			
0300	0330	Egypt, Radio Cairo	9475am				
0300	0330	S Africa, Channel Africa	9525af				
0300	0330	Thailand, Radio	15460na				
0300	0330	UK, BBC World Service	3255af	5975am	6005af	6135am	6190af
0300	0330	6195eu 7120af 7160af	9410eu	11730af	12035as	12095me	
		15280as 15310as	15360as	15575me	17760as	17790as	21660as
		21830as					
0300	0330	USA, KJES Vado NM	7555na				
0300	0345	Germany, Deutsche Welle	9535na	9640na	13780am	15105na	
0300	0345	Iraq, Radio Iraq Intl	7157irr	9887irr	11785irr		
0300	0358	New Zealand, Radio NZ Intl	17675pa				
0300	0400	Anguilla, Caribbean Beacon	6090am				
0300	0400	vi Australia, ABC/Alice Spngs	4835do				
0300	0400	vi Australia, ABC/Kathenne	5025do				
0300	0400	vi Australia, ABC/Tennant Creek	4910do				
0300	0400	Australia, Christian Voice	21550as	21680pa			
0300	0400	Australia, Radio	9660pa	12080pa	15240as	15415as	15515va
		17580va 17750as 21725va					
0300	0400	mtwhf Bhutan, Bhutan BC Service	6035do				
0300	0400	vi Botswana, Radio	3356da	4820do	7255do		
0300	0400	Bulgaria, Radio	7400na	9400na			
0300	0400	Canada, CBC Northern Service	9625da				
0300	0400	Canada, CFRX Toronto ON	6070do				
0300	0400	Canada, CFVP Calgary AB	6030do				
0300	0400	Canada, CHNX Halifax, NS	6130do				
0300	0400	Canada, CKZN St John's NF	6160do				
0300	0400	Canada, CKZU Vancouver BC	6160do				
0300	0400	China, China Radio Intl	9690na				
0300	0400	Costa Rica, Fara del Caribe	5054ca	6175ca	9644ca		
0300	0400	Costa Rica, R for Peace Intl	7455va	15045va	15040al		
0300	0400	Costa Rica, University Network	5030am	6150am	7375am	9724sa	
		11870am 13749na 17645as					

0300	0400	Cuba, Radio Havana	6000na	9820na	11705usb		
0300	0400	Ecuador, HCJB	9745na	11840na	21455usb		
0300	0400	a/monthly Finland, Scandv Weekend Radio	5990va	11720va			
0300	0400	vi Guatemala, Radio Cultural	3300da	5955do			
0300	0400	Guyana, Voice of	3290do	5950do			
0300	0400	sm Honduras, Radio Luz y Vida	3250ca				
0300	0400	Japan, Radio	17825ca	21610pa			
0300	0400	Kenya, Kenya BC Corp	4885irr	4915irr			
0300	0400	vi Lesotho, Radio	4800do				
0300	0400	Malaysia, Radio	7295do				
0300	0400	Malaysia, Voice of	6175as	9750as	15295pa		
0300	0400	Namibia, Namibian BC Corp	3270af	3289af			
0300	0400	Oman, Radio Sultanate of	15355va				
0300	0400	vi Papua New Guinea, NBC	9675do	11880irr		15120pa	15270pa
0300	0400	Philippines, Radyo Pilipinas	11885				
0300	0400	Russia, Voice of Russia	7180na	9725na	17595na		
0300	0400	Singapore, SBC Radio One	6150da				
0300	0400	vi Saloman Islands, SIBC	5020da	9545da			
0300	0400	Sri Lanka, SIBC	6005as	9770as	15425as		
0300	0400	Taiwan, Radio Taipei Intl	7196do	5950na	9680na	11875pa	15320as
0300	0400	Uganda, Radio	7196do				
0300	0400	USA, Armed Forces Radio		6458usb	12689usb		
0300	0400	USA, KAIJ Dallas TX	5755va				
0300	0400	USA, KTBN Salt Lake City UT		7510na			
0300	0400	USA, KWHR Naalehu HI	17510as				
0300	0400	USA, Voice of America	5855af	6080af	7105af	7275af	7290af
		7340af 9575af	9885af	17895af			
0300	0400	USA, WBCQ Monticello ME	7415na	9335na			
0300	0400	USA, WEWN Birmingham AL	5825na	7425na	15745na		
0300	0400	USA, WHRA Greenbush ME	7580eu				
0300	0400	USA, WHRI Noblesville IN	5745va	7315am			
0300	0400	USA, WINB, Red Lion PA	12160am				
0300	0400	USA, WJCR Upton KY	7490am	13595as			
0300	0400	USA, WMLK Bethel PA	9465eu				
0300	0400	USA, WRMI Miami FL	7385na				
0300	0400	USA, WRNO New Orleans LA		7395am			
0300	0400	USA, WSHB Cypress Crk SC		5850na	7535eu		
0300	0400	USA, WTJC Newport NC	9370na				
0300	0400	USA, WWCR Nashville TN		3215na	5070na	5935na	7435na
0300	0400	USA, WWFV McCaysville GA		6890va	12172va		
0300	0400	USA, WYFR Okeechobee FL		6065na	9505na		
0300	0400	vi Vanuatu, Radio	3945do	4960do	7260do		
0300	0400	Zambia, Christian Voice	4965do				
0305	0310	Zimbabwe, Zimbabwe BC Corp		4828do	6045do		
0310	0315	Croatia, The Voice of Croatia		9925na			
0310	0315	Vatican City, Vatican Radio		7305am	9605am	9660af	
0315	0340	Vatican City, Vatican Radio		9660af			
0330	0345	vi Libya, Voice of Africa	11815af	15435af	17725af		
0330	0350	UAE, Emirates Radio	12005na	13675na	15400na		
0330	0357	Vietnam, Voice of	6175na				
0330	0400	Austria, AWR Europe	17635as				
0330	0400	mtwhf Hungary, Radio Budapest		9835na			
0330	0400	Myanmar, Radio	9730do				
0330	0400	Sweden, Radio	9495na				
0330	0400	UK, BBC World Service	3255af	5975am	6005af	6135am	6190af
		6195eu 7120af 7160af	9410eu	11730af	12035as	12095me	
		15280as 15310as	15420af	15575me			
0345	0400	f Seychelles, FEBA Radio	11885af				
0345	0400	Tajikistan, Radio	7245as				
0359	0400	New Zealand, Radio NZ Intl		15340pa			

Hauser's Highlights

CANADA: Radio Canada International

B-01 in English via Sackville only:

1300-

Shortwave Guide

0400 UTC - 11PM E / 10PM C / 8PM P

0400	0427		Czech Rep, Radio Prague Intl	7345no	7385no	9435no		
0400	0430		Australia, Radio 17580pa 21725pa	9660po	12080vo	15240po	15415as	15515vo
0400	0430	os	Australia, Radio	17750as				
0400	0430		Belgium, RVI Flanders R Intl	11985no				
0400	0430		France Radio France Intl	11910af				
0400	0430	s twlfta	Mexico, Radio Mexico Intl	9705am	11770am			
0400	0430	vi	Nigeria, Radio/Kaduna	6090do	7275do			
0400	0430		S Africa, AWR Africa	9650af				
0400	0430		S Africa, Channel Africa	5955af				
0400	0430		Sri Lanka, SLBC	6005os	9770as	15425as		
0400	0430		USA, WRMI Miami FL	7385na				
0400	0445		Germany, Deutsche Welle	7225af	9565of	9765of	13690af	
0400	0450		Turkey, Voice of	6020no	7240vo			
0400	0455		USA, WYFR Okeechobee FL	6065no	9355eu	9505na		
0400	0456		Romania, Radio Romania Intl	11940na	15365na	17735os	21480as	
0400	0500		Anguilla, Caribbean Beacon	6090am				
0400	0500	vi	Australia, ABC/Alice Springs	4835do				
0400	0500	vi	Australia, ABC/Katherine	5025do				
0400	0500	vi	Australia, ABC/Tennant Creek	4910do				
0400	0500	vi	Australia, Christian Voice	21550os				
0400	0500	vi	Botswana, Radio	4820do	7255do			
0400	0500		Canada, CBC Northern Service	9625do				
0400	0500		Canada, CFRX Toronto ON	6070do				
0400	0500		Canada, CFVP Calgary AB	6030do				
0400	0500		Canada, CHNX Halifax, NS	6130do				
0400	0500		Canada, CKZN St John's NF	6160do				
0400	0500		Canada, CKZU Vancouver BC	6160do				
0400	0500		China, China Radio Intl	9560no	9730no			
0400	0500		Costa Rica, R for Peace Intl	7455vo	15045va	15040af		
0400	0500		Costa Rica, University Network	5030om	6150om	7375om	9724so	
			11870om 13749no 17645os					
0400	0500		Cuba, Radio Havana	6000no	9820no	11705usb		
0400	0500		Ecuador, HCJB	9745no	11840no	21455usb		
0400	0500	o/monthly	Finland, Scandy Weekend Radio	5990vo	11720vo			
0400	0500	vi	Guatemala, Radio Cultural	3300do	5955do			
0400	0500		Guyana, Voice of	3290do				
0400	0500		Kenya, Kenya BC Corp	4885irr	4915irr			
0400	0500	vi	Lesotho, Radio	4800do				
0400	0500		Malaysia, Radio	7295do				
0400	0500		Malaysia, Voice of	6175os	9750os	15295pa		
0400	0500		Myanmar, Radio	9730do				
0400	0500		Namibia, Namibian BC Corp	3270of	3289of			
0400	0500		New Zealand, Radio NZ Intl	15340pa				
0400	0500	vi	Nigeria, Radio/Enugu	6025do				
0400	0500	vi	Papua New Guinea, NBC	9675do	11880irr			
0400	0500		Russia, Voice of Russia	7180no	11750no	15455no	17650no	
			17690na					
0400	0500		Singapore, SBC Radio One	6150do				
0400	0500	vi	Solomon Islands, SIBC	5020do	9545do			
0400	0500		Uganda, Radio	7196do				
0400	0500		UK, BBC World Service	3255of	6005of	6135om	6175om	
			6190af 6195eu 7120of	7160af	9410eu	12035eu	12095me	
			15280os 15310os 15420of	15575me	17640of	17760os	17790os	
			21660os 21830os					
0400	0500		Ukraine, Radio Ukraine Intl	7285os	7375os	7420as	9610as	
0400	0500		USA, Armed Forces Radio	6458usb	12689usb			
0400	0500		USA, KAIJ Dallas TX	5755vo				
0400	0500		USA, KTBN Salt Lake City UT	7510na				
0400	0500		USA, KWHR Noalehu HI	17780as				
0400	0500		USA, Voice of America	4960af	5855of	6080of	7275of	7290of
			9530vo 9575af 11965me	15205vo	17895af			
0400	0500		USA, WBQC Monticello ME	7415no	9335no			
0400	0500		USA, WEWN Birmingham AL	5825no	7425na	15745na		
0400	0500		USA, WHRA Greenbush ME	7580eu				
0400	0500		USA, WHRI Noblesville IN	5745vo	7315om			
0400	0500		USA, WINB, Red Lion PA	12160am				
0400	0500		USA, WJCR Upton KY	7490om	13595os			
0400	0500		USA, WMLK Bethel PA	9465eu				
0400	0500		USA, WSHB Cypress Crk SC	7535eu	15195af			
0400	0500		USA, WTJC Newport NC	9370na				
0400	0500		USA, WWCR Nashville TN	3215no	5070na	5935na	7435na	
0400	0500		USA, WWVF McCaysville GA	6890vo	12172va			
0400	0500	vi	Zambia, Christian Voice	6065do				
0400	0500	vi	Zimbabwe, Zimbabwe BC Corp	4828do	6045do			
0405	0410		Croatia, The Voice of Croatia	9925irr				
0427	0525	o	Liberia, Voice of Hope	12060of	15320af			
0430	0457		Czech Rep, Radio Prague Intl	9865vo	11600vo			
0430	0500		Australia, Christian Voice	21680pa				
0430	0500		Australia, Radio	9660po	12080pa	15240os	15415as	15515vo
			17580pa 21725pa					
0430	0500		Italy, Italian Radio Relay Svc	3985vo				
0430	0500		Netherlands, Radio	6165no	9590na			
0430	0500	vi	Nigeria, Radio/Ibadan	6050do				
0430	0500	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
0430	0500	vi	Nigeria, Radio/Lagos	3326do	4990do			
0430	0500		S Africa, AWR Africa	12080of				
0430	0500	mtwhtfo	Swaziland, Trans World Radio	3200af	4775af			
0430	0500	s twhtfo	USA, WRMI Miami FL	7385no				
0430	0500		Yugoslavia, Radio	11870na				
0445	0500		Italy, RAI International	5965af	7235of			
0445	0500		USA, WYFR Okeechobee FL	9355eu				

0500 UTC - 12AM E / 11PM C / 9PM P

0500	0515		Canada, CBC Northern Service	9625do				
0500	0515		Israel, Kol Israel	6280vo	17545vo			

0500	0515	s htb	USA, KVOH Los Angeles CA	9975na				
0500	0515		Zambia, National BC Corp	6265do				
0500	0520		Vatican City, Vatican Radio	9660af	11625af	11625af	15570af	
0500	0530	os	Australia, Radio	17750as				
0500	0530		France Radio France Intl	13610af	15155of			
0500	0530	s twlfta	Mexico, Radio Mexico Intl	9705om	11770om			
0500	0530		Netherlands, Radio	6165na				
0500	0530		S Africa, AWR Africa	5960af				
0500	0530		S Africa, Channel Africa	15215of				
0500	0530	s twlfta	USA, WRMI Miami FL	7385na				
0500	0530	vi	Zimbabwe, Zimbabwe BC Corp	4828do	6045do			
0500	0545		Germany, Deutsche Welle	9690no	9785no	11985no		
0500	0600		Anguilla, Caribbean Beacon	6090am				
0500	0600	vi	Australia, ABC/Alice Springs	4835do				
0500	0600	vi	Australia, ABC/Katherine	5025do				
0500	0600	vi	Australia, ABC/Tennant Creek	4910do				
0500	0600		Australia, Christian Voice	21550os	21680po	7255do		
0500	0600	vi	Botswana, Radio	3356do				
0500	0600		Canada, CFRX Toronto ON	6070do				
0500	0600		Canada, CFVP Calgary AB	6030do				
0500	0600		Canada, CHNX Halifax, NS	6130do				
0500	0600		Canada, CKZN St John's NF	6160do				
0500	0600		Canada, CKZU Vancouver BC	6160do				
0500	0600		Costa Rica, R for Peace Intl	7455va	15045vo	15040af		
0500	0600		Costa Rica, University Network	5030om	6150om	7375om	9724so	
			11870om 13749no 17645as					
0500	0600		Cuba, Radio Havana	9550na	9820no	9830usb		
0500	0600		Ecuador, HCJB	9745na	11840no	21455usb		
0500	0600	a/rmonthly	Finland, Scandy Weekend Radio	5990vo	11720vo			
0500	0600		Guyana, Voice of	3290do				
0500	0600		Italy, Italian Radio Relay Svc	3985vo				
0500	0600		Japan, Radio	5975eu	7230eu	11715os	11760os	
			13630na 15195as 17810pa					
0500	0600		Kenya, Kenya BC Corp	4885irr	4915irr			
0500	0600		Kuwait, Radio	15110as				
0500	0600	vi	Lesotho, Radio	4800do				
0500	0600		Malaysia, Radio	7295do				
0500	0600		Malaysia, RTM Sarawak	7160do				
0500	0600		Malaysia, Voice of	6175os	9750os	15295pa		
0500	0600		Myanmar, Radio	9730do				
0500	0600		Nomibia, Namibian BC Corp	3270of	3289of			
0500	0600		New Zealand, Radio NZ Intl	15340pa				
0500	0600	vi	Nigeria, Radio/Enugu	6025do				
0500	0600	vi	Nigeria, Radio/Ibadan	6050do				
0500	0600	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
0500	0600	vi	Nigeria, Radio/Lagos	3326do	4990do			
0500	0600		Nigeria, Voice of	7255af	11770af	15120vo		
0500	0600	vi	Papua New Guinea, NBC	9675do	11880irr			
0500	0600		Russia, Voice of Russia	7180no	11750no	12000na	15455no	17650no
			17660na 17690na					
0500	0600		Singapore, SBC Radio One	6150do				
0500	0600	vi	Solomon Islands, SIBC	5020do	9545do			
0500	0600		Spain, Radio Exterior Espana	6055no				
0500	0600		Swaziland, Trans World Radio	4775af	6035af	9500af		
0500	0600		Uganda, Radio	7196do				
0500	0600		UK, BBC World Service	5975am	6005of	6175om	6190af	6195eu
			7160af 9410eu					

Shortwave Guide



0800 UTC - 3AM E / 2AM C / 12AM P

0800 0815	Guam, KTWR/ Trans World R	15200as			
0800 0825	Malaysia, Voice of	61750s	15295pa		
0800 0827	Czech Rep, Radio Prague Intl	11600eu	15255eu		
0800 0830 vl	Australia, ABC/Alice Springs	4835do			
0800 0830 vl	Australia, ABC/Katherine	5025do			
0800 0830 vl	Australia, ABC/Tennant Creek	4910do			
0800 0830	Australia, Radio	5995pa	9710pa	12080vo	13605pa 15240vo
	154150s 21725pa				
0800 0830	Belgium, RVI Flanders R Intl	5985eu			
0800 0830	Myanmar, Radio	9730do			
0800 0830	Sierra Leone, Sierra Leone BS	3316do			
0800 0859	Germany, Voice of Hope	5975eu	21590me		
0800 0900	Anguilla, Caribbean Beacon	6090am			
0800 0900	Australia, Christian Voice	17820as	21680pa		
0800 0900	Bhutan, Bhutan BC Service	6035do			
0800 0900	Botswana, Radio	7255do	9600do		
0800 0900	Canada, CFRX Toronto ON	6070do			
0800 0900	Canada, CFVP Calgary AB	6030do			
0800 0900	Canada, CHNX Halifax, NS	6130do			
0800 0900	Canada, CKZN St John's NF	6160do			
0800 0900	Canada, CKZU Vancouver BC	6160do			
0800 0900	Costa Rica, R for Peace Intl	7455va	15045va	15040al	
0800 0900	Costa Rica, University Network	5030am	6150am	7375am	9724sa
	11870am 13749na 17645as				
0800 0900	Ecuador, HCJB	9780eu	11755pa	21455usb	
0800 0900	Eq Guinea, Radio Africa	15185of			
0800 0900	Eq Guinea, Radio East Africa	15185of			
0800 0900	Finland, Scandy Weekend Radio	6170va	11720va		
0800 0900	Germany, Deutsche Welle	13640eu			
0800 0900	Germany, Overcomer Ministries	13800pa	13810ou		
0800 0900	Ghana, Ghana BC Corp	3366do	4915do		
0800 0900	Guyana, Voice of	3290do	5950do		
0800 0900	Indonesia, Voice of	9525pa			
0800 0900	Italy, Italian Radio Relay Svc	7120va			
0800 0900	Kenya, Kenya BC Corp	4885irr	4915irr		
0800 0900	Lesotho, Radio	4800do			
0800 0900	Liberia, ELWA	4760do			
0800 0900	Liberia, Radio Liberia Intl	6100do			
0800 0900	Malaysia, Radio	7295do			
0800 0900	Monaco, Trans World Radio	9870eu			
0800 0900	Namibia, Namibian BC Corp	7165af	7215af		
0800 0900	New Zealand, Radio NZ Intl	11675pa			
0800 0900	Nigeria, Radio/Enugu	6025do			
0800 0900	Nigeria, Radio/Ibadan	6050do			
0800 0900	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0800 0900	Nigeria, Radio/Lagos	3326do	4990do		
0800 0900	Nigeria, Voice of	7255of	11770af	15120va	
0800 0900	Papua New Guinea, NBC	4890do	4890do		
0800 0900	Russia, Voice of Russia	15490ou	17495ou	17525ou	17635ou 17685ou
0800 0900	S Africa, S African Radio League	9750af	21560af		
0800 0900	Singapore, SBC Radio One	6150do			
0800 0900	Solomon Islands, SIBC	5020do			
0800 0900	South Korea, Radio Korea Intl	9570om	13670eu		
0800 0900	UK, BBC World Service	6190of	9740as	11940af	12095eu 15310as
	15360os 15400af 15485eu				17640eu 17760os 17630af
	17885of 21470af 21660as				21830os
0800 0900	UK, BBC World Service	15575as			
0800 0900	USA, Armed Forces Radio	6458usb	12689usb		
0800 0900	USA, KAIJ Dallas TX	5755va			
0800 0900	USA, KNLS Anchor Point AK	11765as			
0800 0900	USA, KTNB Salt Lake City UT	7510na			
0800 0900	USA, KWHR Noalehu HI	11565pa			
0800 0900	USA, Voice of America	11930as	13610as	15150as	
0800 0900	USA, WBCQ Monticello ME	7415na			
0800 0900	USA, WEWN Birmingham AL	5825na	7425na	15745na	
0800 0900	USA, WHRA Greenbush ME	11730af			
0800 0900	USA, WHRI Noblesville IN	5745va	7315am		
0800 0900	USA, WJCR Upton KY	7490am	13595as		
0800 0900	USA, WMLK Bethel PA	9465eu			
0800 0900	USA, WRNO New Orleans LA	7395am			
0800 0900	USA, WSHB Cypress Crk SC	9845ou	9860eu	11615eu	
0800 0900	USA, WTJC Newport NC	9370nc			
0800 0900	USA, WWCN Nashville TN	3210no	5070no	5935na	7435no
0800 0900	Vanuatu, Radio	3945do	4960do		
0800 0900	Zambia, Christian Voice	9865do			
0800 0900	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
0805 0810	Croatia, The Voice of Croatia	13820irr			
0810 0830 s	Armenia, Voice of Armenia	4810eu	15270eu		
0815 0900	Guam, KTWR/ Trans World R	15200os	15330os		
0815 0900	Seychelles, FEBA Radio	15460os			
0830 0900	Australia, ABC/Alice Springs	2310do			
0830 0900	Australia, ABC/Katherine	2485do			
0830 0900	Australia, ABC/Tennant Creek	2325do			
0830 0900	Australia, Radio	5995pc	9710pa	12080vo	13605pa 15240vo
	154150s 177500s 21725pa				
0830 0900	Austria, AWK Europe	17780cf			
0830 0900	Georgia, Georgian Radio	11910eu			
0830 0900	Italy/Adv World Radio Europe	9610eu			
0830 0900	Switzerland, Swiss Radio Intl	21770af			
0855 0900 s	Taiwan, CBS	11725os			

0900 UTC - 4AM E / 3AM C / 1AM P

0900 0915 vl	Ghana, Ghana BC Corp	3366do	4915do		
0900 0920	Monaco, Trans World Radio	9870eu			
0900 0930	Australia, Radio	11880cs	13605pa	15240as	21820as
0900 0930	Guam, KTWR/ Trans World R	15330os			

0900 0930	UK, BBC World Service	6190af	6195as	9605as	9740os	11760me
	11940af 11945os	12095eu	15190sa	15310os	15360as	15400af
	15485eu 15565eu	15575os	17640eu	17655as	17760as	17790os
	17830af 17885of	21470af	21660as			
0900 0945	Germany, Deutsche Welle	6160pa	12035af	15410af	15470af	
	17715pa 17770pa	17800af	21560af	21680pa	21790os	
0900 1000	Anguilla, Caribbean Beacon	6090am				
0900 1000 vl	Australia, ABC/Alice Springs	2310do				
0900 1000 vl	Australia, ABC/Katherine	2485do				
0900 1000 vl	Australia, ABC/Tennant Creek	2325do				
0900 1000	Australia, Christian Voice	13775pa	17725pa			
0900 1000	Botswana, Radio	7255do	9600do			
0900 1000	Canada, CFRX Toronto ON	6070do				
0900 1000	Canada, CFVP Calgary AB	6030do				
0900 1000	Canada, CHNX Halifax, NS	6130do				
0900 1000	Canada, CKZN St John's NF	6160do				
0900 1000	Canada, CKZU Vancouver BC	6160do				
0900 1000	China, China Radio Intl	11730pa				
0900 1000	Costa Rica, R for Peace Intl	7455va	15045va	15040al		
0900 1000	Costa Rica, University Network	5030am	6150am	7375am	9724sa	
	11870am 13749na 17645as					
0900 1000	Ecuador, HCJB	11775pa	21455usb			
0900 1000	Eq Guinea, Radio Africa	15185of				
0900 1000	Eq Guinea, Radio East Africa	15185of				
0900 1000	Finland, Scandy Weekend Radio	6170va	11720va			
0900 1000	Germany, Good News World R	5985eu	5995eu			
0900 1000	Germany, Overcomer Ministries	13800pa	13810ou			
0900 1000	Germany, Voice of Hope	5975eu	21590me			
0900 1000	Guyana, Voice of	3290do	5950do			
0900 1000	Italy, Italian Radio Relay Svc	7120va				
0900 1000	Kenya, Kenya BC Corp	4885irr	4915irr			
0900 1000	Lesotho, Radio	4800do				
0900 1000	Liberia, ELWA	4760do				
0900 1000	Liberia, Radio Liberia Intl	6100do				
0900 1000	Malaysia, Radio	7295do				
0900 1000	Malta, Voice of Mediterranean	9840eu				
0900 1000	Namibia, Namibian BC Corp	7165af	7215af			
0900 1000	New Zealand, Radio NZ Intl	11675pa				
0900 1000	Nigeria, Radio/Enugu	6025do				
0900 1000	Nigeria, Radio/Ibadan	6050do				
0900 1000	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
0900 1000	Nigeria, Radio/Lagos	3326do	4990do			
0900 1000	Nigeria, Voice of	7255af	11770af	15120va		
0900 1000	Palau, KHBN/Voice of Hope	15725as				
0900 1000	Papua New Guinea, NBC	4890do	4890do			
0900 1000	Russia, Voice of Russia	15490ou	17495ou	17525ou	17635ou	17685ou
0900 1000	Singapore, SBC Radio One	6150do				
0900 1000	Solomon Islands, SIBC	5020do				
0900 1000	USA, Armed Forces Radio	6458usb	12689usb			
0900 1000	USA, KAIJ Dallas TX	5755va				
0900 1000	USA, KTNB Salt Lake City UT	7510na				
0900 1000	USA, KWHR Noalehu HI	11565pa				
0900 1000	USA, Voice of America	11930as	13610as	15150as		
0900 1000	USA, WBCQ Monticello ME	7415na				
0900 1000	USA, WEWN Birmingham AL	5825na	7425na	15745na		
0900 1000	USA, WHRA Greenbush ME	11730af				
0900 1000	USA, WHRI Noblesville IN	5745va	7315am			
0900 1000	USA, WJCR Upton KY	7490am	13595as			
0900 1000	USA, WMLK Bethel PA	9465eu				
0900 1000	USA, WRNO New Orleans LA	7395am				
0900 1000	USA, WSHB Cypress Crk SC	9845ou	9860eu	11615eu		
0900 1000	USA, WTJC Newport NC	9370nc				
0900 1000	USA, WWCN Nashville TN	3210no	5070no	5935na	7435no	
0900 1000	Vanuatu, Radio	3945do	4960do			
0900 1000	Zambia, Christian Voice	9865do				
0900 1000	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			
0910 0920	Greece, Voice of Greece	12105eu				
0915 1000 vl	Ghana, Ghana BC Corp	6130do	4915do			
0915 1000 vl/as	Ghana, Ghana BC Corp	4915do				
0930 1000	Australia, Radio	11880os	13605pa	15240as	17750as	21820as
0930 1000	Georgia, Georgian Radio	11910me				
0930 1000	Lithuania, Radio Vilnius	9710eu				
0930 1000	Netherlands, Radio	7260va	9790vo	12065va		
0930 1000	UK, BBC World Service	6190af	6195as	9740as	11760me	11940af
	12095eu 15190sa	15310as	15360os	15400af	15485eu	15565eu
	17660os 17790os	17885of	17790os	17830af	17885af	21470af
	21660os					

1000 UTC - 5AM E / 4AM C / 2AM P

1000 1005	New Zealand, Radio NZ Intl	11675pa			
1000 1027	Czech Rep, Radio Prague Intl	21745va			
1000 1027	Vietnam, Voice of	12019as			
1000 1030	Guam, KSDA/ Adventist World R	11560as			11705as
1000 1030	Palau, KHBN/Voice of Hope	15725as			
1000 1030	UK, BBC World Service				

Shortwave Guide



1000	1100	Canada, CKZU Vancouver BC	6160da				
1000	1100	Costa Rica, R for Peace Intl	15045va	15040al			
1000	1100	Costa Rica, University Network	5030am	6150am	7375am	9724sa	
		11870am 13749na 17645as					
1000	1100	Ecuador, HCJB	11755pa	21455usb			
1000	1100	Eq Guinea, Radio Africa	15185of				
1000	1100	Eq. Guinea, Radio East Africa	15185of				
1000	1100	Finland, Scandv Weekend Radio	6170va	11720va			
1000	1100	Germany, Voice of Hope 21590me					
1000	1100	Ghana, Ghana BC Corp	6130da				
1000	1100	Ghana, Ghana BC Corp	4915da				
1000	1100	Guyana, Voice of	5950da				
1000	1100	India, All India Radio	11585os	13700u	15770as	17510au	17840os
		17895au					
1000	1100	Italy, Italian Radio Relay Svc	7120va				
1000	1100	Japan, Radio	9695pa	15590as	21755pa		
1000	1100	Kenya, Kenya BC Corp	4885irr				
1000	1100	Lesotho, Radio	4800da				
1000	1100	Liberia, ELWA	4760da				
1000	1100	Liberia, Radio Liberia Intl	6100da				
1000	1100	Malaysia, Radio	7295da				
1000	1100	Namibia, Namibian BC Corp	7165af	7215af			
1000	1100	Netherlands, Radio	7260va	9790va	12065va		
1000	1100	Nigeria, Radio/Enugu	6025da				
1000	1100	Nigeria, Radio/Ibadan	6050da				
1000	1100	Nigeria, Radio/Kaduna	4770da	6090da	7275da	9570da	
1000	1100	Nigeria, Radio/Lagos	4990da	7285da			
1000	1100	Papua New Guinea, NBC	4890da	9675irr			
1000	1100	Singapore, SBC Radio One	6150da				
1000	1100	Saloman Islands, SIBC	5020da				
1000	1100	USA, Armed Forces Radio	6458usb	12689usb			
1000	1100	USA, KAIJ Dallas TX	5755va				
1000	1100	USA, KTNB Salt Lake City UT	7510na				
1000	1100	USA, KWHR Naalehu HI 9930as	11565pa				
1000	1100	USA, Voice of America	5745am	9590am	9770pa	15240os	
		15425as					
1000	1100	USA, WBCQ Monticella ME	7415na				
1000	1100	USA, WEWN Birmingham AL	5825na	7425na	15395na	15745eu	
1000	1100	USA, WHRI Noblesville IN	6040na	9495am			
1000	1100	USA, WJCR Upton KY	7490am	13595as			
1000	1100	USA, WRMI Miami FL	9955am				
1000	1100	USA, WRNO New Orleans LA	7395am				
1000	1100	USA, WSHB Cypress Crk SC	6095am	9455sa	11870os		
1000	1100	USA, WTJC Newport NC 9370na					
1000	1100	USA, WWCR Nashville TN	5070na	5935na	7260na	15685na	
1000	1100	USA, WYFR Okeechobee FL	5950na				
1000	1100	Vanuatu, Radio	3945da	4960da	7260da		
1000	1100	Vatican City, Vatican Radio	4885da				
1000	1100	Zambia, Christian Voice 9865da					
1000	1100	Zimbabwe, Zimbabwe BC Corp	5975da	6045da			
1006	1100	New Zealand, Radio NZ Intl	15175pa				
1030	1045	Ethiopia, Radio	5990da	7110da	9705da		
1030	1050	UAE, Emirates Radio	13675eu	15370eu	15395eu	21605eu	
1030	1100	Guam, KSDA/ Adventist World R	11560as				
1030	1100	Malaysia, RTM Sarawak 7160da					
1030	1100	Mongolia, Voice of	12085au				
1030	1100	Palau, KHBN/Voice of Hope	9965as	15725as			
1030	1100	UK, BBC World Service	6190af	6195va	9740as	11760me	11940af
		12095eu	15310as	15485eu	15565eu	15575os	17640eu
		17885af	21470af				
1045	1100	Germany, Deutsche Welle	13640eu				
1055	1100	Pakistan, Radio	17520os	17900os	21465os	21850as	

1100 UTC - 6AM E / 5AM C / 3AM P

1100	1127	Vietnam, Voice of	7285as				
1100	1130	Australia, Radio	5995pa	6020pa	9475as	9580va	11650pa
		11880as 12080va	13605va	15240as	21820as		
1100	1130	Netherlands, Radio	7260va	9790va	12065va		
1100	1130	UK, BBC Caribbean Report	6195ca	15220ca			
1100	1130	UK, BBC World Service	6190af	6195os	9740as	9815as	11760me
		11940af	11955as	12095eu	15280os	15310as	15400af
		15565eu	15575as	17640eu	17700os	17790sa	17885af
		21470af					
1100	1130	UK, BBC World Service	6195am	15190sa	15220am		
1100	1145	Germany, Deutsche Welle	11785af	15410af	17860af	21780af	
1100	1150	UAE, Emirates Radio	13675eu	15395eu	21605eu		
1100	1200	Anguilla, Caribbean Beacon	11775am				
1100	1200	Australia, ABC/Alice Springs	2310da				
1100	1200	Australia, ABC/Katherine	2485da				
1100	1200	Australia, ABC/Tennant Creek	2325da				
1100	1200	Australia, Christian Voice	13775pa	15530as	17655pa	17725pa	
1100	1200	Botswana, Radio	7255da	9600da			
1100	1200	Canada, CBC Northern Service	9625da				
1100	1200	Canada, CFRX Toronto ON	6070da				
1100	1200	Canada, CFVP Calgary AB	6030da				
1100	1200	Canada, CHNX Halifax, NS	6130da				
1100	1200	Canada, CKZN St John's NF	6160da				
1100	1200	Canada, CKZU Vancouver BC	6160da				
1100	1200	Costa Rica, R for Peace Intl	15045va	15040al			
1100	1200	Costa Rica, University Network	5030am	6150am	7375am	9724sa	
		11870am 13749na 17645as					
1100	1200	Ecuador, HCJB	12005am	15115am	21455usb		
1100	1200	Eq Guinea, Radio Africa	15185af				
1100	1200	Eq. Guinea, Radio East Africa	15185af				
1100	1200	Finland, Scandv Weekend Radio	6170va	11720va			
1100	1200	Germany, Voice of Hope 21590me					
1100	1200	Ghana, Ghana BC Corp	6130da				
1100	1200	Ghana, Ghana BC Corp	4915da				
1100	1200	Guyana, Voice of	5950da				
1100	1200	Iran, VO Islamic Rep. of Iran	15385as	15430as	15585as	21470as	
		21730as					

1100	1200	as/vl	Italy, Italian Radio Relay Svc	7120va			
1100	1200		Japan, Radio	6120na	9695pa	15590as	
1100	1200		Kenya, Kenya BC Corp	4885irr	4915irr		
1100	1200	vl	Lesotho, Radio	4800da			
1100	1200		Liberia, ELWA	4760da			
1100	1200		Liberia, Radio Liberia Intl	6100da			
1100	1200		Malaysia, Radio	7295da			
1100	1200		Malaysia, TRM Sarawak 7160da				
1100	1200		Namibia, Namibian BC Corp	7165af	7215af		
1100	1200		New Zealand, Radio NZ Intl	15175pa			
1100	1200	vl	Nigeria, Radio/Enugu	6025da			
1100	1200	vl	Nigeria, Radio/Ibadan	6050da			
1100	1200	vl	Nigeria, Radio/Kaduna	4770da	6090da	7275da	9570da
1100	1200	vl	Nigeria, Radio/Lagos	4990da	7285da		
1100	1200		Palau, KHBN/Voice of Hope	9965as			
1100	1200	vl	Papua New Guinea, NBC	4890da	9675irr		
1100	1200		Singapore, Radio Singapore Intl	6150as	9600as		
1100	1200		Switzerland, Swiss Radio Intl	9540va			
1100	1200		Taiwan, Radio Taipei Intl	7445as	7445as	11905as	
1100	1200		Taiwan, Voice of Asia	7445as			
1100	1200		USA, Armed Forces Radio	6458usb	12689usb		
1100	1200		USA, KAIJ Dallas TX	5755va			
1100	1200		USA, KTNB Salt Lake City UT	7510na			
1100	1200		USA, KWHR Naalehu HI 9930as	11565pa			
1100	1200		USA, Voice of America	6160as	9645as	9760as	9770pa
			15240os				15160os
1100	1200		USA, WEWN Birmingham AL	5825na	7425na	15395na	15745eu
1100	1200		USA, WHRI Noblesville IN	6040na	9495am		
1100	1200		USA, WJCR Upton KY	7490am	13595as		
1100	1200	mtwhfa	USA, WRMI Miami FL	9955am			
1100	1200		USA, WRNO New Orleans LA	7395am			
1100	1200		USA, WSHB Cypress Crk SC	6095am	9455sa	11590am	11660am
1100	1200		USA, WTJC Newport NC 9370na				
1100	1200		USA, WWCR Nashville TN	5070na	5935na	7260na	15685na
1100	1200	vl/s	USA, WYFR Okeechobee FL	5950na			
1100	1200		Vanuatu, Radio	3945da	4960da	7260da	
1100	1200		Zambia, Christian Voice 9865da				
1100	1200	vl	Zimbabwe, Zimbabwe BC Corp	5975da	6045da		
1115	1127		Zambia, National BC Corp	6265da			
1115	1145		Nepal, Radio 5005as	7165as			
1130	1135		Israel, Kol Israel	15640va	17545va		
1130	1145	vl	Libya, Voice of Africa	11815af	15435af	17725af	
1130	1157		Czech Rep. Radio Prague Intl	11640eu	21745as		
1130	1200		Australia, Radio	5995pa	6020pa	9475as	9580va
			11880as 12080va	13605va	21820as	11650pa	
1130	1200	a	Austria, Radio Austria Intl	6155eu	13730eu		
1130	1200		Belgium, RVI Flanders R Intl	9865as			
1130	1200		Netherlands, Radio	5965na	6045eu	9860eu	
1130	1200		South Korea, Radio Korea Intl	9650na			
1130	1200		UK, BBC World Service	6190af	6195os	9740as	9815as
			11940af	11955as	12095eu	15220am	15280os
			15575as	17640eu	17700os	17830af	17885af
			17830af			21470af	15485eu
1130	1200	f	Vatican City, Vatican Radio	15595va	17515va		

1200 UTC - 7AM E / 6AM C / 4AM P

1200	1205		New Zealand, Radio NZ Intl	15175pa			
1200	1220	fa	Kazakhstan, Radio Almaty	9620eu	11840eu		
1200	1220	mtwhf	UK, BBC Caribbean Report	6195ca	15220ca		
1200	1220		UK, BBC World Service	6190af	6195os	9740as	9815as
			11940af	11955as	12095eu	15280os	15310as
			15575as	17640eu	17700os	17830af	17885af
1200	1220	as	UK, BBC World Service	6195am	15220am		
1200	1230		France Radio France Intl	15540af	25820af		
1200	1230		Iran, VO Islamic Rep. of Iran	15385as	15430as	15585as	21470as
			21730as				
1200	1230		Philippines, FEBC	15110as			
1200	1230		South Korea, Radio Korea Intl	9650na			
1200	1230		Uzbekistan, Radio Tashkent	7285as	9715as	15295as	17775as
1200	1245		USA, WYFR Okeechobee FL	5850na	5950na	17750na	
1200	1256		North Korea, Voice of Korea	3560va	9640va	9850va	9975va
			11334va	13650va			
1200	1259		Canada, Radio Canada Intl	9660as	11730as		
1200	1300		Anguilla, Caribbean Beacon	11775am			
1200	1300	vl	Australia, ABC/Alice Springs	2310da			
1200	1300	vl	Australia, ABC/Katherine	2485da			
1200	1300	vl	Australia, ABC/Tennant Creek	2325da			
1200	1300		Australia, Christian Voice	13775pa	15530as	17725pa	
1200	1300		Australia, Radio	5995pa	6020pa	9475as	9580as
			11880as 21820as				
1200	1300	vl	Bangladesh, Bangla Betor	7185as	9550as		
1200	1300		Botswana, Radio	7255da	9600da		
1200	1300		Bulgaria, Radio	15700eu	17500eu		
1200	1300		Canada, CBC Northern Service	9625da			
1200	1300		Canada, CFRX Toronto ON	6070da			
1200	130						

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1200	1300	vi	Lesotho, Radio	4800do					
1200	1300		Liberia, Radio Liberia Intl		6100do				
1200	1300		Malaysia, Radio	7295do					
1200	1300		Nambia, Namibian BC Corp	7165of	7215of				
1200	1300		Netherlands, Radio	5965na	6045eu	9860eu			
1200	1300	vi	Nigeria, Radio/Enugu	6025do					
1200	1300	vi	Nigeria, Radio/Ibadan	6050do					
1200	1300	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do		
1200	1300	vi	Nigeria, Radio/Lagos	4990do	7285do				
1200	1300		Palau, KHBN/Voice of Hope	9965os					
1200	1300	vi	Papua New Guinea, N8C	4890do	9675srr				
1200	1300		Singapore, Radio Singapore Intl	6150os	9600os				
1200	1300		Taiwan, Radio Taipei Intl	7130os	9610au				
1200	1300		Ukraine, Radio Ukraine Intl	11720eu	11825na	15520no			
1200	1300		USA, Armed Forces Radio	6458usb	12689usb				
1200	1300		USA, KAJI Dallas TX	5755vo					
1200	1300		USA, K8BN Salt Lake City UT	7510no					
1200	1300		USA, KWHR Noalehu HI 9930as	11565pc					
1200	1300		USA, Voice of America	6160as	9645as	9760as	15160as	13240as	
1200	1300		USA, WEWN Birmingham AL	5825no	7425no	15375na	15745eu		
1200	1300		USA, WHRI Noblesville IN	6040no	9495om				
1200	1300		USA, WINB Red Lion PA	13570am					
1200	1300		USA, WJCR Upton KY	7490am	13595os				
1200	1300	mtwhfo	USA, WRMI Miami FL	15724no					
1200	1300	s	USA, WRMI Miami FL	9955am					
1200	1300		USA, WRNO New Orleans LA	7395am					
1200	1300		USA, WSHB Cypress Crk SC	6095am	9455am	9875as	11590am		
1200	1300		USA, WTJC Newport NC	9370na					
1200	1300		USA, WWCR Nashville TN	7435no	12160no	13845na	15685na		
1200	1300		USA, WWVF McCaysville GA	6890vo	12172vo				
1200	1300	vi/s	Vanuatu, Radio	3945do	4960do	7260do			
1200	1300		Zambia, Christian Voice	9865do					
1200	1300	vi	Zimbabwe, Zimbabwe BC Corp	5975do	6045do				
1206	1300	occsnal	New Zealand, Radio NZ Intl	6095pa					
1215	1300		Egypt, Radio Cairo	17595as					
1220	1240	w	Kazakhstan, Radio Almaty	9620eu	11840eu				
1220	1300		UK, BBC World Service	6190af	6195as	9740os	9815as	1176Cme	
			11940af	11955os	12095eu	15220om	15280as	15310as	15485eu
			15565eu	15575os	17640eu	17700os	17830af	17885af	21470af
1225	1300		Sri Lanka, SLBC	6005os	9770os	15425as			
1230	1257		Vietnam, Voice of	12019as	15115os				
1230	1300		Finland, YLE/Radio Finland	15400no	17670no				
1230	1300		Germany, Overcomer Ministries	6110eu					
1230	1300		Italy/Adv World Radio Europe	9610eu					
1230	1300		Sweden, Radio	18960no					
1230	1300		Thailand, Radio	9810vo					
1230	1300	a	UK, Wales Radio Intl	17810au					
1240	1300	:	Kazakhstan, Radio Almaty	9620eu	11840eu				
1245	1300		Germany, Deutsche Welle	13640eu					
1245	1300	a	Seychelles, FEBA Radio	15535me					
1245	1300		USA, WYFR Okeechobee FL	17750no					
1255	1300	mtwhfo	Taiwan, CBS 6180as	7250as	9630as	11725as	11775as		

1300 UTC - 8AM E / 7AM C / 5AM P

1300	1325		Netherlands, Radio	5965na	6045eu	9860eu			
1300	1330		Australia, Radio	5995pa	6020pa	9475os	9580vo	11650vo	
			11880os	21820os					
1300	1330		Egypt, Radio Cairo	17595as					
1300	1330		Guam, KSDA/ Adventist World R	15385as					
1300	1355		Poland, Radio Polonia	6095eu	7270eu	9525eu	11820eu		
1300	1400		Anguilla, Caribbean Beacon	11775am					
1300	1400	vi	Australia, ABC/Alice Springs	2310do					
1300	1400	vi	Australia, ABC/Katherine	2485do					
1300	1400	vi	Australia, ABC/Tennant Creek	2325do					
1300	1400		Australia, Christian Voice	13660pa	13775pa	15155os			
1300	1400	vi	Botswana, Radio	7255do	9600do				
1300	1400		Canada, CBC Northern Service	9625do					
1300	1400		Canada, CFRX Toronto ON	6070do					
1300	1400		Canada, CFVP Calgary AB	6030do					
1300	1400		Canada, CHNX Halifax, NS	6130do					
1300	1400		Canada, CKZN St John's NF	6160do					
1300	1400		Canada, CKZU Vancouver BC	6160do					
1300	1400	mtwhf	Canada, Radio Canada Intl	9515am	13655am	17710am			
1300	1400		China, China Radio Intl	7405na	9570no	11760pa	11900pa	11980as	
			15180os						
1300	1400		China, Voice of Hope	13820os					
1300	1400		Costa Rica, R for Peace Intl	15045vo	15040al	21815usb			
1300	1400		Costa Rica, University Network	5030am	6150am	7375am	9725sa		
			11870om	13749na	17645as				
1300	1400		Ecuador, HCJB	12005am	15115om	21455usb			
1300	1400	as/vl	Eq. Guinea, Radio East Africa	15185of					
1300	1400	a/monthly	Finland, Scandv Weekend Radio	6170vo	11720vo				
1300	1400		Germany, Deutsche Welle	13640eu					
1300	1400		Germany, Overcomer Ministries	6110eu	13810af				
1300	1400		Germany, Voice of Hope	15715me					
1300	1400	vi	Ghana, Ghana BC Corp	4915do	6130do				
1300	1400		Guyana, Voice of	5950do					
1300	1400	as/vl	Italy, Italian Radio Relay Svc	7120vo					
1300	1400		Jordan, Radio	11690eu					
1300	1400		Kenya, Kenya BC Corp	4885srr	4915srr				
1300	1400	vi	Lesotho, Radio	4800do					
1300	1400		Liberia, Radio Liberia Intl	6100do					
1300	1400		Malaysia, Radio	7295do					
1300	1400		Nambia, Namibian BC Corp	7165of	7215of				
1300	1400	occsnal	New Zealand, Radio NZ Intl	6095pa					
1300	1400	vi	Nigeria, Radio/Enugu	6025do					
1300	1400	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do		
1300	1400	vi	Nigeria, Radio/Lagos	4990do	7285do				

1300	1400		Palau, KHBN/Voice of Hope	9965os					
1300	1400	vi	Papua New Guinea, N8C	4890do	9675srr				
1300	1400	as	S Africa, Channel Africa	11720af	17780af	21725af			
1300	1400		Singapore, Radio Singapore Intl	6150os	9600os				
1300	1400		South Korea, Radio Korea Intl	9570os	13670om				
1300	1400		Sri Lanka, SLBC	6005as	9770os	15425as			
1300	1400		Uganda, Radio	7196do					
1300	1400		UK, BBC World Service	6190af	9740os	9815as	11760me	11940of	
			12095eu	15220om	15310os	15420of	15485eu	15565eu	15575me
			17640eu	17700as	17830af	17885of	21470af		
			USA, Armed Forces Radio						
			USA, KAJI Dallas TX	5755vo					
			USA, KNLS Anchor Point AK		9615as				
			USA, KT8N Salt Lake City UT		7510na				
			USA, KWHR Noalehu HI 9930as		11565pa				
			USA, Voice of America	6160os	9645as	9760os	15160os	15425as	
			USA, WBCQ Monticello ME		17495na				
			USA, WEWN Birmingham AL	11875na	11530na	11550na	15375na		
			15745eu						
			USA, WHRI Noblesville IN	6040no	15105am				
			USA, WINB Red Lion PA	13570am					
			USA, WJCR Upton KY	7490am	13595os				
		mtwhfo	USA, WRMI Miami FL	15724na					
		s	USA, WRMI Miami FL	9955am					
			USA, WRNO New Orleans LA	7395am					
			USA, WSHB Cypress Crk SC	9430na	9455am	9940os			
			USA, WTJC Newport NC	9370na					
			USA, WWCR Nashville TN	9475na	12160na	13845na	15685na		
			USA, WWVF McCaysville GA	9400vo	12172vo				
			USA, WYFR Okeechobee FL	11550as	11830na	11970na	17750na		
			Zambia, Christian Voice	9865do					
		vi	Zimbabwe, Zimbabwe BC Corp	5975do	6045do				
			UAE, Emirates Radio	13630eu	13675eu	15395eu	21605eu		
			Vietnam, Voice of	9730eu	11630eu	13740eu			
			Australia, Radio	5995pa	6020pa	9475os	9580vo	11650vo	
			11660as	21820os					
1330	1400	s	Austria, Radio Austria Intl	6155eu	13730eu	21789as			
1330	1400		Guam, KSDA/ Adventist World R	11705as	11980os				
1330	1400		India, All India Radio	9690os	11620os	13710os			
1330	1400		Laos, Lao National Radio	7145os					
1330	1400		Sweden, Radio	9430vo	17505vo	18960na			
1330	1400		Turkey, Voice of	17690os	17815eu				
1330	1400		UAE, AWR Africa	15385vo					
1330	1400		UK, BBC World Service	6190af	6195as	9740os	9815as	11760me	
			11940af	12095eu	15220om	15310as	15420af	15485eu	15565eu
			15575me	17640eu	17700os	17830af	17885af	21470af	
1330	1400		Uzbekistan, Radio Tashkent	7285os	9715as	15295os	17775os		

1400 UTC - 9AM E / 8AM C / 6AM P

1400	1427		Czech Rep, Radio Prague Intl	21745va					
1400	1430		Ecuador, HCJB	12005am	15115om	21455usb			
1400	1430		Guam, KSDA/ Adventist World R	17720os					
1400	1430		Thailand, Radio	9530vo					
1400	1430	as	UK, BBC World Service	15245os					
1400	1430	s	USA, Voice of America	18275va					
1400	1455	as	S Africa, Channel Africa	11720af	17780af	21725af			
1400	1456		Romania, Radio Romania Intl	15250eu	17735eu				
1400	1500		Anguilla, Caribbean Beacon	11775am					
1400	1500	vi	Australia, ABC/Alice Springs	2310do					
1400	1500	vi	Australia, ABC/Katherine	2485do					
1400	1500	vi	Australia, ABC/Tennant Creek	2325do					
1400	1500		Australia, Christian Voice	13660pa	13775pa	15155os			
1400	1500	vi	Australia, Radio	5995vo	9580vo	11660os			
1400	1500	vi	Botswana, Radio	7255do	9600do				
1400	1500		Cameroon, CRTV Radio Buea	6005do					
1400	1500		Canada, CBC Northern Service	9625do					
1400	1500		Canada, CFRX Toronto ON	6070do					
1400	1500		Canada, CFVP Calgary AB	6030do					
1400	1500		Canada, CHNX Halifax, NS	6130do					

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1400	1500	vi	Nigeria, Radio/Lagos	4990do	7285do				
1400	1500		Oman, Radio Sultanate of		15140va				
1400	1500		Palau, KHBN/Voice of Hope		9965as				
1400	1500		Singapore, SBC Radio One		6150do				
1400	1500		Sri Lanka, SLBC	6005as	9770as	15425as			
1400	1500		Taiwan, Radio Taipei Intl		15265as				
1400	1500		Uganda, Radio	7196do					
1400	1500		UK, BBC World Service	6190af	6195as	9740as	9815as	11940af	
1400	1500			12095eu	15310as	15485eu	15565eu	15575me	17640eu
1400	1500			17830af	17840am	21470af	21660af		
1400	1500		USA, Armed Forces Radio			12689usb			
1400	1500		USA, KAJI Dallas TX	13815va					
1400	1500		USA, KJES Vado NM	11715na					
1400	1500		USA, KTNB Salt Lake City UT		7510na				
1400	1500		USA, KWHR Naalehu HI	9930as	11565pa				
1400	1500		USA, Voice of America	6160as	7125as	9645as	9760as	15160as	
1400	1500			15255va	15425as				
1400	1500		USA, WBCQ Monticello ME		17495na				
1400	1500		USA, WEWN Birmingham AL		11875na	11530na	11550na	15375na	
1400	1500			15745eu					
1400	1500		USA, WHRI Noblesville IN		6040na	15105am			
1400	1500		USA, WINB Red Lion PA	13750am					
1400	1500		USA, WJCR Upton KY	7490am	13595as				
1400	1500	mtwhfa	USA, WRMI Miami FL	15724na					
1400	1500	s	USA, WRMI Miami FL	9955am					
1400	1500		USA, WRNO New Orleans LA		7395am				
1400	1500		USA, WTJC Newport NC	9370na					
1400	1500		USA, WWCR Nashville TN		9475na	12160na	13845na	15685na	
1400	1500		USA, WWFV McCaysville GA		9400va	12172va			
1400	1500		USA, WYFR Okeechobee FL		11550as	11830na	11970na	17750na	
1400	1500		Zambia, Christian Voice	9865do					
1400	1500	vi	Zimbabwe, Zimbabwe BC Corp		5975do	6045do			
1415	1420		Nepal, Radio 5005as	7165as					
1430	1500		Guam, KTWR/ Trans World R		15330as				
1430	1500		Malaysia, RTM Kota Kinabalu		5980do				
1430	1500		Myanmar, Radio	5985do					
1430	1500		Netherlands, Radio	12070as	12080as	15220na	15595as		
1430	1500		Sweden, Radio	17505va	18960na				
1445	1500	f	Seychelles, FEBA Radio	11600as					

1500 UTC - 10AM E / 9AM C / 7AM P

1500	1530		Australia, Radio	5995va	9580va	11650va	11660as		
1500	1530		Mexico, Radio Mexica Intl		9705am	11770am			
1500	1530		Mongolia, Voice of	12015as	12085as				
1500	1530		S Africa, Channel Africa	17770af					
1500	1530	h	Seychelles, FEBA Radio	11600as					
1500	1530		UK, BBC World Service	5975as	6190af	6195as	9740as	11860af	
1500	1530			11940af	12095eu	15310as	15400af	15420af	15485eu
1500	1530			17700as	17830af	17840am	21470af	21490af	21660af
1500	1530		USA, VOA Special English		6160as	9590as	9760as	9845as	
1500	1556		North Korea, Voice of Korea		4405va	6574na	9335na	11710na	
1500	1557		Canada, Radio Canada Intl		15360as	17820as			
1500	1559		Canada, Radio Canada Intl		9515am	13655am	17710am		
1500	1600		Anguilla, Caribbean Beacon		11775am				
1500	1600	vi	Australia, ABC/Alice Springs		2310do				
1500	1600	vi	Australia, ABC/Katherine		2485do				
1500	1600	vi	Australia, ABC/Tennant Creek		2325do				
1500	1600		Australia, Christian Voice		13660pa	13775pa	15155as		
1500	1600	vi	Botswana, Radio	7255do	9600do				
1500	1600		Canada, CBC Northern Service		9625do				
1500	1600		Canada, CFRX Toronto ON		6070do				
1500	1600		Canada, CFVP Calgary AB		6030do				
1500	1600		Canada, CHNX Halifax, NS		6130do				
1500	1600		Canada, CKZN St John's NF		6160do				
1500	1600		Canada, CKZU Vancouver BC		6160do				
1500	1600		China, China Radio Intl	7160as	9785as				
1500	1600		China, Voice of Hope	13820as					
1500	1600		Costa Rica, R for Peace Intl		15045va	15040af	21815usb		
1500	1600		Costa Rica, University Network		5030am	6150am	7375am	9724sa	
1500	1600	as/vi	Eq. Guinea, Radio East Africa		15185af				
1500	1600	a/monthly	Finland, Scandv Weekend Radio		5990va	11720va			
1500	1600		Germany, Deutsche Welle		13640eu				
1500	1600	as	Germany, Overcomer Ministries		17490eu				
1500	1600		Germany, Overcomer Ministries		5110eu	13810af			
1500	1600	vi	Germany, Voice of Hope	15775as					
1500	1600		Ghana, Ghana BC Corp		4915do	6130do			
1500	1600		Guam, KTWR/ Trans World R		15330as				
1500	1600		Guyana, Voice of	5950do					
1500	1600		Japan, Radio	7200pa	9750as	11730as			
1500	1600		Jordan, Radio	11690na	17680af				
1500	1600		Kenya, Kenya BC Corp	4885sirr	4915sirr				
1500	1600	vi	Lesotho, Radio	4800do					
1500	1600		Liberia, Radio Liberia Intl		6100do				
1500	1600		Malaysia, Radio	7295do					
1500	1600		Malaysia, RTM Kota Kinabalu		5980do				
1500	1600		Malaysia, RTM Sarawak	7160do					
1500	1600		Myanmar, Radio	5985do					
1500	1600		Namibia, Namibian BC Corp		7165af	7215af			
1500	1600		Netherlands, Radio	12070as	12080as	15220na	15595as		
1500	1600	accsna	New Zealand, Radio NZ Intl		6095pa				
1500	1600	vi	Nigeria, Radio/Enugu	6025do					
1500	1600	vi	Nigeria, Radio/Ibadan	6050do					
1500	1600	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do		
1500	1600	vi	Nigeria, Radio/Lagos	4990do	7285do				
1500	1600		Russia, Voice of Russia	9745as	12055as	15550as			
1500	1600		Singapore, SBC Radio One		6150do				
1500	1600		Sri Lanka, SLBC	6005as	9770as	15425as			

1500	1600		Uganda, Radio	7196do					
1500	1600	s	UK, Merlin Network One	6175eu					
1500	1600		USA, Armed Forces Radio		6458usb	12689usb			
1500	1600		USA, KAJI Dallas TX	13815va					
1500	1600		USA, KTNB Salt Lake City UT		7510na				
1500	1600		USA, KWHR Naalehu HI	9930as	11565pa				
1500	1600		USA, Voice of America	7125as	9645as	9700me	15205eu	15255va	
1500	1600		USA, WBCQ Monticello ME		9335na	17495na			
1500	1600		USA, WEWN Birmingham AL		11875na	11530na	11550na	15375na	
1500	1600			15745eu					
1500	1600		USA, WHRA Greenbush ME		17650af				
1500	1600		USA, WHRI Noblesville IN		13760va	15105am			
1500	1600		USA, WINB Red Lion PA	13570am					
1500	1600		USA, WJCR Upton KY	7490am	13595as				
1500	1600	mtwhfa	USA, WRMI Miami FL	15724na					
1500	1600	s	USA, WRMI Miami FL	9955am					
1500	1600		USA, WRNO New Orleans LA		7395am				
1500	1600		USA, WTJC Newport NC	9370na					
1500	1600		USA, WWCR Nashville TN		9475na	12160na	13845na	15685na	
1500	1600		USA, WWFV McCaysville GA		9400va	12172va			
1500	1600		USA, WYFR Okeechobee FL		5280as	11830na	17750na		
1500	1600	vi	Zambia, Zimbabwe BC Corp		5975do	6045do			
1515	1600	m	Seychelles, FEBA Radio	11600as					
1530	1600		Australia, Radio	5995va	9475as	9580va	11650va	11660as	
1530	1600		Austria, AWR Europe	7165eu	17660as				
1530	1600		Austria, Radio Austria Intl		6155eu	13730eu	17865na		
1530	1600	vi	Botswana, Radio	3356do	4820do	7255do			
1530	1600		Iran, VO Islamic Rep. of Iran		7245as	9635as	11775na		
1530	1600	as	Seychelles, FEBA Radio	11600as					
1530	1600		UK, BBC World Service	5975as	6190af	6195as	9740as	9815as	
1530	1600			11940af	12095eu	15310as	15400af	15485eu	15565eu
1530	1600			17830af	17840am	21470af	21660af	17700as	
1550	1600		Vatican City, Vatican Radio		12065au	13765au	15235au		

1600 UTC - 11AM E / 10AM C / 8AM P

1600	1610		Vatican City, Vatican Radio		12065au	13765au	15235au		
1600	1615		Pakistan, Radio	11570as	12050as	15100as	15600as	17750as	
1600	1620		UAE, Emirates Radio	13630eu	13675eu	15395eu	21605eu		
1600	1625		Netherlands, Radio	12070as	12080as	15220na	15595as		
1600	1630	s	Germany, Universal Life	15530af					
1600	1630		Iran, VO Islamic Rep. of Iran		7245as	9635as	11775as		
1600	1630		Mexico, Radio Mexica Intl		9705am	11770am			
1600	1630		S Africa, Channel Africa	9525af					
1600	1630		UK, BBC World Service	3915as	5975as	6190af	6195as	7160as	
1600	1630			9410eu	9740as	11940af	12095eu	15310as	15400af
1600	1630			15565eu	17700as	17830af	17840am	21470af	21660af
1600	1630	vi	Zimbabwe, Zimbabwe BC Corp		5975do	6045do			
1600	1645	a/monthly	Finland, Scandv Weekend Radio		5990va	11720va			
1600	1650	accsna	New Zealand, Radio NZ Intl		6095pa				
1600	1656		North Korea, Voice of Korea		3560va	6520va	9660va	9975va	
1600	1659	as	Canada, Radio Canada Intl		9515am	13655am	17710am		
1600	1700		Algeria, Radio Algiers Intl		11715va	15160va			
1600	1700		Anguilla, Caribbean Beacon		11775am				
1600	1700	vi	Australia, ABC/Alice Springs		2310do				
1600	1700	vi	Australia, ABC/Katherine		2485do				
1600	1700	vi	Australia, ABC/Tennant Creek		2325do				
1600	1700		Australia, Christian Voice		7170pa	13660pa	15115as		
1600	1700		Australia, Radio	5995va	9475as	9580va	11650va	11660as	
1600	1700	vi	Botswana, Radio	3356do	4820do	7255do			
1600	1700		Canada, CBC Northern Service		9625do				
1600	1700		Canada, CFRX Toronto ON		6070do				
1600	1700		Canada, CFVP Calgary AB		6030do				
1600	1700		Canada, CHNX Halifax, NS		6130do				
1600	1700		Canada, CKZN St John's NF		6160do				
1600	1700		Canada, CKZU Vancouver BC		6160do				

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1600	1700	Costa Rica, University Network 11870am 13749na	5030am	6150am	7375am	9724sa
1600	1700	Ethiopia, Radio	7165af	9560af		
1600	1700	France Radio France Intl	11615af	11995af	12015af	17850af
1600	1700	Germany, Deutsche Welle		13640eu		
1600	1700	Germany, Good News World R		15105af		
1600	1700	Germany, Overcomer Ministries		17490eu		
1600	1700	Ghana, Ghana BC Corp		4915do	6130do	
1600	1700	Greece, Voice of Greece	9420eu	15630eu	17705na	
1600	1700	Guam, KSDA/ Adventist World R		11850as		
1600	1700	Guyana, Voice of	5950do			
1600	1700	Jordan, Radio	11690na	17680af		
1600	1700	Kenya, Kenya BC Corp	4885irr	4915irr		
1600	1700	Lesotho, Radio	4800do			
1600	1700	Liberia, Radio Liberia Intl		6100do		
1600	1700	Malaysia, Radio	7295do			
1600	1700	Namibia, Namibian BC Corp		7165af	7215af	
1600	1700	Nigeria, Radio/Enugu	6025do			
1600	1700	Nigeria, Radio/Ibadan	6050do			
1600	1700	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
1600	1700	Nigeria, Radio/Lagos	3326do	4990do		
1600	1700	Russia, Voice of Russia	4940me	4965me	4975me	7325me 9730eu
1600	1700	11500as 11985me				
1600	1700	South Korea, Radio Korea Intl		5975am	6150eu	9515af 9870af
1600	1700	Taiwan, Radio Taipei Intl		11550as		
1600	1700	Uganda, Radio	7196do			
1600	1700	UK, Merlin Network One	6175eu			
1600	1700	UK, World Beacon	15455eu			
1600	1700	USA, Armed Forces Radio		6458usb	12689usb	
1600	1700	USA, KAJI Dallas TX	13815va			
1600	1700	USA, KTNB Salt Lake City UT		15590na		
1600	1700	USA, KWHR Naalehu HI	9930as			
1600	1700	USA, VOA Special English		13600af	15445af	17895af
1600	1700	USA, Voice of America	6035af	6160as	7125as	9645as 9700me
1600	1700	9760as 13605af 13710af		15205eu	15225af	15255va 15410af
1600	1700	USA, WBCQ Monticello ME		9335na	17495na	
1600	1700	USA, WEWN Birmingham AL		11550na	11530na	13615na 15575na
1600	1700	USA, WHRA Greenbush ME		17650af		
1600	1700	USA, WHRI Noblesville IN		13760va	15105am	
1600	1700	USA, WINB Red Lion PA	13570am			
1600	1700	USA, WJCR Upton KY	7490am			
1600	1700	USA, WRMI Miami FL	15724na			
1600	1700	USA, WRMI Miami FL	9955am			
1600	1700	USA, WRNO New Orleans LA		7395am	15420am	
1600	1700	USA, WSHB Cypress Crk SC		18910af		
1600	1700	USA, WTJC Newport NC	9370na			
1600	1700	USA, WWCR Nashville TN		9475na	12160na	13845na 15685na
1600	1700	USA, WWFV McCaysville GA		9400va	12172va	
1600	1700	USA, WYFR Okeechobee FL		11830na	17750na	18980eu 21455eu
1600	1700	21525af				
1600	1700	Zambia, Christian Voice	4965do			
1615	1700	UK, BBC World Service	11860af	21490af		
1630	1657	Vietnam, Voice of	9730eu	11630af	13740eu	
1630	1700	Cameroon, CRTV Radio Buea		6005do		
1630	1700	Egypt, Radio Cairo	15255af			
1630	1700	Georgia, Georgian Radio		6180me		
1630	1700	UK, BBC World Service	11860af	21490af		
1630	1700	UK, BBC World Service	3915as	5975as	6109af 6195as 7160as	
1630	1700	9410eu 9740as 11940af		12095eu	15310as 15400af 15420af	
1630	1700	15485eu 15565eu 17700as		17830af	17840am 21470af 21660af	
1630	1700	UK, Merlin Network One	11535as			
1630	1700	UK, Merlin Network One	11590as			
1630	1700	UK, Merlin Network One	11540as			
1645	1700	Zimbabwe, Zimbabwe BC Corp		4828do	6045do	
1645	1700	Finland, Scandy Weekend Radio		6170va	11720va	
1645	1700	Tajikistan, Radio	7245as			
1650	1700	New Zealand, Radio NZ Intl		11725pa		

1700 UTC - 12PM E / 11AM C / 9AM P

1700	1727	Czech Rep, Radio Prague Intl	5930eu	17485eu		
1700	1727	Vietnam, Voice of	12070eu			
1700	1730	Azerbaijan, Voice of	6110eu	9155eu		
1700	1730	Finland, Scandy Weekend Radio		6170va	11720va	
1700	1730	France Radio France Intl	11615af	15605af		
1700	1730	Germany, Overcomer Ministries		6110eu		
1700	1730	Israel, Kol Israel	11605va	17545va		
1700	1730	Jordan, Radio	11690na	17680af		
1700	1730	Malta, Voice of Mediterranean		6110eu	9840eu	
1700	1730	S Africa, Channel Africa	17870af			
1700	1745	Germany, Deutsche Welle		6140eu		
1700	1746	UK, BBC World Service	3255af	3915as	5975as	6005af 6190af
		6195eu 7160as 9410eu		9510as	9630af 9740as 12095eu	
		15400af 15420af 15485eu		15575me	17830af 21470af	
		New Zealand, Radio NZ Intl		11725pa		
1700	1756	Romania, Radio Romania Intl		11740eu		
1700	1800	Anguilla, Caribbean Beacon		11775am		
1700	1800	Australia, ABC/Alice Springs		2310do		
1700	1800	Australia, ABC/Katherine		2485do		
1700	1800	Australia, ABC/Tennant Creek		2325do		
1700	1800	Australia, Christian Voice		7170pa	13660pa 15115as	
1700	1800	Australia, Radio	5995va	9475as	9580va 9655va 9815as	
		11880va				
1700	1800	Botswana, Radio	3356do	4820do	7255do	
1700	1800	Canada, CBC Northern Service		9625do		
1700	1800	Canada, CFRX Toronto ON		6070do		
1700	1800	Canada, CFVP Calgary AB		6030do		
1700	1800	Canada, CHNX Halifax, NS		6130do		
1700	1800	Canada, CKZN St John's NF		6130do		
1700	1800	Canada, CKZU Vancouver BC		6160do		

1700	1800	China, China Radio Intl	7150af	9570af	9695af	11910af	15125af
1700	1800	Costa Rica, R for Peace Intl		15045va	15040af	21815usb	
1700	1800	Costa Rica, University Network		5030am	6150am	7375am	9724sa
		11870am 13749na					
1700	1800	Egypt, Radio Cairo	15255af				
1700	1800	Eqt Guinea, Radio Africa		15185af			
1700	1800	Germany, Good News World R		11795me			
1700	1800	Germany, Overcomer Ministries		17490eu			
1700	1800	Germany, Voice of Hope	9815eu				
1700	1800	Germany, Unt Methodist Church		13820af	15485af		
1700	1800	Ghana, Ghana BC Corp		3366do	4915do		
1700	1800	Guyana, Voice of	5950do				
1700	1800	Italy, Italian Radio Relay Svc		3985va			
1700	1800	Japan, Radio	9505na	11970eu	15355af		
1700	1800	Kenya, Kenya BC Corp	4885irr	4915irr			
1700	1800	Lesotho, Radio	4800do				
1700	1800	Liberia, Radio Liberia Intl		6100do			
1700	1800	Namibia, Namibian BC Corp		3270af	3289af		
1700	1800	Nigeria, Radio/Enugu	6025do				
1700	1800	Nigeria, Radio/Ibadan	6050do				
1700	1800	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1700	1800	Nigeria, Radio/Lagos	3326do	4990do			
1700	1800	Russia, Voice of Russia	7305as	9730eu	11985me	12055as	15540me
1700	1800	Sierra Leone, Sierra Leone 85		3316do			
1700	1800	Uganda, Radio	7196do				
1700	1800	UK, Merlin Network One	11540as				
1700	1800	UK, World Beacon	15455eu				
1700	1800	USA, Armed Forces Radio		6458usb	12689usb		
1700	1800	USA, KAJI Dallas TX	13815va				
1700	1800	USA, KTNB Salt Lake City UT		15590na			
1700	1800	USA, KWHR Naalehu HI	9930as				
1700	1800	USA, Voice of America	6160as	7125as	7170as	9645as 9700me	
1700	1800	9760af 15255va 15410af		15445af	15445af	15445af	
1700	1800	USA, Voice of America	5990as	6045as	7215as	9550as 9770as	
1700	1800	USA, WBCQ Monticello ME		9335na	17495na		
1700	1800	USA, WEWN Birmingham AL		11550na	11530na	13615na 15745na	
		17595eu					
1700	1800	USA, WHRA Greenbush ME		17650af			
1700	1800	USA, WHRI Noblesville IN		13760va	15105am		
1700	1800	USA, WINB Red Lion PA	13570am				
1700	1800	USA, WJCR Upton KY	7490am				
1700	1800	USA, WMLK Bethel PA	15265eu				
1700	1800	USA, WRMI Miami FL	15724na				
1700	1800	USA, WRNO New Orleans LA		7395am	15420am		
1700	1800	USA, WSHB Cypress Crk SC		18910af			
1700	1800	USA, WTJC Newport NC	9370na				
1700	1800	USA, WWCR Nashville TN		9475na	12160na	13845na 15685na	
1700	1800	USA, WWFV McCaysville GA		9400va	12172va		
1700	1800	USA, WYFR Okeechobee FL		11830na	17750na	18980eu 21455eu	
1700	1800	1715 1730					
1725	1745	UK, United Nations Radio		6125af			
1730	1745	Libya, Voice of Africa	11815af	15435af	17725af		
1730	1745	Swaziland, Trans World Radio		9500af			
1730	1745	Swaziland, Trans World Radio		3200af			
1730	1800	Finland, Scandy Weekend Radio		6170va	11690va		
1730	1800	Guam, KSDA/ Adventist World R		11965as			
1730	1800	Liberia, ELWA	4760do				
1730	1800	Netherlands, Radio	6020af	11655as			
1730	1800	Philippines, Radyo Pilipinas		11720pa	15190pa	17720pa	
1730	1800	S Africa, AWR Africa	12130af				
1730	1800	Slovakia, Radio Slovakia Intl		5920eu	6055eu	7345eu	
1730	1800	Switzerland, Swiss Radio Intl		9605va	13790va	15555va	
1730	1800	Vatican City, Vatican Radio		13765af	15570af	17515af	
1735	1745	Paraguay, Radio Nacional		9739sa			
1745	1800	Bangladesh, Bangla Betar		7185eu	9550eu	15520eu	
1745	1800	Germany, Deutsche Welle		6140eu			
1745	1800	India, All India Radio	7410eu	9950as	11935af	13605af 15155af	
		17670af					
1745	1800	Swaziland, Trans World Radio		3200af			

Shortwave Guide



1800	1900	Australia, Christian Voice	7170pa	9795pa			
1800	1900	Australia, Radio 11880va	6080pa	7240va	9475os	9580va	9815pa
1800	1900	Botswana, Radio	3356da	4820da			
1800	1900	Canada, CBC Northern Service	9625da	6070da			
1800	1900	Canada, CFRX Toronto ON	6070da	6030da			
1800	1900	Canada, CFVP Calgary AB	6130da	6160da			
1800	1900	Canada, CHNX Halifax, NS	6160da	6160da			
1800	1900	Canada, CKZN St John's NF	6160da	15045va	15040al	21815usb	
1800	1900	Canada, CKZU Vancouver BC	6160da	5030am	6150am	7375am	9724sa
1800	1900	Costa Rica, R for Peace Intl	11870am	13749na	17645as		
1800	1900	Costa Rica, University Network	5030am	6150am	7375am	9724sa	
1800	1900	Eqt Guinea, Radio Africa	15185af				
1800	1900	Finland, Scandv Weekend Radio	6170va	11690va			
1800	1900	Germany, Unt Methodist Church	13820af	15485af			
1800	1900	Germany, Voice of Hope	9815eu				
1800	1900	Ghana, Ghana BC Corp	3366da	4915da			
1800	1900	Greece, Voice of Greece	9420eu	15630eu	17705na		
1800	1900	Guyana, Voice of	5950da				
1800	1900	India, All India Radio	7410as	9950as	11935af	13605af	15155af
1800	1900	Italy, Italian Radio Relay Svc	3985va				
1800	1900	Kenya, Kenya BC Corp	4885irr	4915irr			
1800	1900	Kuwait, Radio	11990va				
1800	1900	Lesotho, Radio	4800da				
1800	1900	Liberia, ELWA	4760da				
1800	1900	Liberia, Radio Liberia Intl	5100da				
1800	1900	Nambbia, Nambian BC Corp	3270af	3289af			
1800	1900	Netherlands, Radio	6020af	11655af			
1800	1900	New Zealand, Radio NZ Intl	15160pa				
1800	1900	Nigeria, Radio/Enugu	6025da				
1800	1900	Nigeria, Radio/Ibadan	6050da				
1800	1900	Nigeria, Radio/Kaduna	4770da	6090da	7275da	9570da	
1800	1900	Nigeria, Radio/Lagos	3326da	4990da			
1800	1900	Philippines, Radyo Pilipinas	11720pa	15190pa	17720pa		
1800	1900	Russia, Voice of Russia	7420eu	9480eu	9820eu	11675eu	
1800	1900	Russia, Voice of Russia	7310eu	9730eu	9775eu	9890eu	11510af
1800	1900	Russia, World Beacon	15365eu				
1800	1900	S Africa, African Beacon	3230af				
1800	1900	S Africa, Radio Lufonia	3345af				
1800	1900	S Africa, S African Radio League	3215af				
1800	1900	Sierra Leone, Sierra Leone BS	3316da				
1800	1900	Swaziland, Trans World Radio	3200af	9500af			
1800	1900	Taiwan, Radio Taipei Intl	3955eu				
1800	1900	Uganda, Radio	7196da				
1800	1900	UK, World Beacon	15585af	17665af			
1800	1900	USA, Armed Forces Radio	6458usb	12689usb			
1800	1900	USA, KAJI Dallas TX	13815va				
1800	1900	USA, KTBN Salt Lake City UT	15590na				
1800	1900	USA, KWHR Noalehu HI	17510as				
1800	1900	USA, Voice of America	6035af	7415af	9760af	9770me	11975af
1800	1900	USA, WBCQ Monticello ME	9335na	17495na			
1800	1900	USA, WEWN Birmingham AL	11550na	11530na	13615na	15745na	
1800	1900	USA, WHRA Greenbush ME	17650af				
1800	1900	USA, WHRI Noblesville IN	9495am	13760va			
1800	1900	USA, WINB Red Lion PA	13570am				
1800	1900	USA, WJCR Upton KY	7490am	13595as			
1800	1900	USA, WMLK Bethel PA	15265eu				
1800	1900	USA, WRMI Miami FL	15724na				
1800	1900	USA, WRNO New Orleans LA	7395am	15420am			
1800	1900	USA, WSHB Cypress Crk SC	15665va	18910af			
1800	1900	USA, WTJC Newport NC	9370na				
1800	1900	USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
1800	1900	USA, WWFR McCaysville GA	9400va	12172va			
1800	1900	USA, WYFR Okeechobee FL	18980eu				
1800	1900	Zambia, Christian Voice	4965da				
1800	1900	Zimbabwe, Zimbabwe BC Corp	4828da	6045da			
1815	1845	S Africa, Radio Lufonia	7155af				
1815	1855	Bangladesh, Bangla Betar	7185eu	9550eu	15520eu		
1830	1900	Greece, Voice of Greece	11645eu				
1830	1900	Austria, Radio Austria Intl	5945eu	6155eu			
1830	1900	Belgium, RVI Flanders R Intl	9925eu	13685eu	13710eu		
1830	1900	Cameroon, CRTV Radio Buea	6005da				
1830	1900	Georgia, Georgian Radio	6230eu				
1830	1900	Georgia, Georgian Radio	6080as				
1830	1900	Netherlands, Radio	9895af	17605af			
1830	1900	Sweden, Radio	6065va				
1830	1900	Sweden, Radio	5840va				
1830	1900	UK, BBC World Service	3255af	6005af	6190af	6195eu	9410eu
1830	1900	UK, RTE Radio	21630me	15400af	15575me	17830af	21470af
1830	1900	UK, RTE Radio	21630me				
1830	1900	USA, Voice of America	11690af	13730af	15525af		
1830	1900	Yugoslavia, Radio	6100eu				
1845	1900	Congo, RTV Congolaise	4765af	5985af			

1900 UTC - 2PM E / 1PM C / 11AM P

1900	1915	Congo, RTV Congolaise	4765da	5985af			
1900	1927	Vietnam, Voice of	9730eu	11630al	13740eu		
1900	1930	Philippines, Radyo Pilipinas	11720pa	15190pa	17720pa		
1900	1945	Germany, Deutsche Welle	11805af	11965af	13720af	15390af	
1900	1945	India, All India Radio	7410as	9950as	11935af	13605af	15155af
1900	1956	North Korea, Voice of Korea	4405va	6574na	6595na	6615na	
			9335na	11710na	13760na		

1900	2000	Anguilla, Caribbean Beacon	11775am				
1900	2000	Australia, ABC/Katherine	2485da				
1900	2000	Australia, ABC/Tennant Creek	2325da				
1900	2000	Australia, Christian Voice	7170pa	9795pa	9580va	9815pa	
1900	2000	Australia, Radio 11880va	6080pa	7240va	9500as	9580va	9815pa
1900	2000	Botswana, Radio	3356da	4820da			
1900	2000	Canada, CFRX Toronto ON	6070da	6030da			
1900	2000	Canada, CFVP Calgary AB	6130da	6160da			
1900	2000	Canada, CHNX Halifax, NS	6130da	6160da			
1900	2000	Canada, CKZN St John's NF	6160da	15045va	15040al	21815usb	
1900	2000	Canada, CKZU Vancouver BC	6160da	5030am	6150am	7375am	9724sa
1900	2000	China, China Radio Intl	9440af	9585af	9595af	13790af	
1900	2000	Costa Rica, R for Peace Intl	11870am	13749na	17645as		
1900	2000	Costa Rica, University Network	5030am	6150am	7375am	9724sa	
1900	2000	Eqt Guinea, Radio Africa	15185af				
1900	2000	Finland, Scandv Weekend Radio	6170va	11690va			
1900	2000	Germany, Deutsche Welle	6140eu				
1900	2000	Ghana, Ghana BC Corp	3366da	4915da			
1900	2000	Italy, Italian Radio Relay Svc	3985va				
1900	2000	Kenya, Kenya BC Corp	4885irr	4915irr			
1900	2000	Kuwait, Radio	11990va				
1900	2000	Lesotho, Radio	4800da				
1900	2000	Liberia, ELWA	4760da				
1900	2000	Liberia, Radio Liberia Intl	5100da				
1900	2000	Nambbia, Nambian BC Corp	3270af	3289af			
1900	2000	Netherlands, Radio	6020af	11655af	17605af		
1900	2000	New Zealand, Radio NZ Intl	15160pa				
1900	2000	Nigeria, Radio/Enugu	6025da				
1900	2000	Nigeria, Radio/Ibadan	6050da				
1900	2000	Nigeria, Radio/Kaduna	4770da	6090da	7275da	9570da	
1900	2000	Nigeria, Radio/Lagos	3326da	4990da			
1900	2000	Russia, Voice of	7255af	11770af	15120va		
1900	2000	Russia, Voice of Russia	7300eu	7310eu	7420eu	9480eu	9745af
1900	2000	Russia, World Beacon	15365eu				
1900	2000	S Africa, African Beacon	3230af				
1900	2000	Sierra Leone, Sierra Leone BS	3316da				
1900	2000	Solomon Islands, SIBC	5020da				
1900	2000	South Korea, Radio Korea Intl	5975om	7275eu			
1900	2000	Swaziland, Trans World Radio	3200af				
1900	2000	Thailand, Radio	9535eu				
1900	2000	Uganda, Radio	7196da				
1900	2000	UK, BBC World Service	3255af	6005af	6190af	6195eu	9410eu
1900	2000	UK, R. Chessington/Merlin	9630af	12095eu	12095eu	15400af	15575me
1900	2000	UK, World Beacon	9675eu	15457af	15585eu	12689usb	
1900	2000	USA, Armed Forces Radio	6458usb	12689usb			
1900	2000	USA, KAJI Dallas TX	13815va				
1900	2000	USA, KJES Vado NM	15385ou				
1900	2000	USA, KTBN Salt Lake City UT	15590na				
1900	2000	USA, KWHR Noalehu HI	17510as				
1900	2000	USA, VOA Special English	7260eu	9680me	13690me		
1900	2000	USA, Voice of America	4950af	6035af	6160me	7375af	7415af
1900	2000	USA, WEWN Birmingham AL	11550na	11530na	13615na	15745na	
1900	2000	USA, WHRA Greenbush ME	17650af				
1900	2000	USA, WHRI Noblesville IN	9495am	13760va			
1900	2000	USA, WINB Red Lion PA	13570am				
1900	2000	USA, WJCR Upton KY	7490am	13595as			
1900	2000	USA, WMLK Bethel PA	15265eu				
1900	2000	USA, WRMI Miami FL	15724na				
1900	2000	USA, WRNO New Orleans LA	7395am	15420am			
1900	2000	USA, WSHB Cypress Crk SC	15665va	18910af			
1900	2000	USA, WTJC Newport NC	9370na				
1900	2000	USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
1900	2000	USA, WWFR McCaysville GA	9400va	12172va			
1900	2000	USA, WYFR Okeechobee FL	18980eu				
1900	2000	Zambia, Christian Voice	4965da				
1900	2000	Zimbabwe, Zimbabwe BC Corp	4828da	6045da			
1900	2000	Georgia, Georgian Radio	11760eu				
1900	2000	Iran, VO Islamic Rep. of Iran	902				

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2130	2200	6190af	6195va	9410eu	11835af	11945as	12095sa	15400af
2145	2200	Uzbekistan, Radio Tashkent			7105eu	9540eu	11905eu	
		USA, WYFR Okeechobee FL			13855af	15120af	17845af	

2200 UTC - 5PM E / 4PM C / 2PM P

2200	2215				15160pa			
2200	2220	s	New Zealand, Radio NZ Intl		15650au			
2200	2220		Greece, Voice of Greece	9425au				
2200	2220		Turkey, Voice of	9525as				
2200	2230		Canada, Radio Canada Intl	6045eu	9770af	9805me	11600va	
2200	2230		India, All India Radio	7150va	7410eu	9650ou	9910au	9950eu
			11620au	11715au				
2200	2230		Iran, VO Islamic Rep. of Iran	9570as	13745as			
2200	2230		Mexico, Radio Mexico Intl	9705am	11770am			
2200	2230	vi	Papua New Guinea, NBC	4890do				
2200	2230		South Korea, Radio Korea Intl	3955eu				
2200	2230	mtwhf	USA, Voice of America	5855af	6035af	7375af	7415af	11975af
2200	2230	mtwhfo	Yugoslavia, Radio	7230au				
2200	2245		Egypt, Radio Cairo	9990eu				
2200	2245		USA, WYFR Okeechobee FL		11740na	15120af	17725af	17845af
2200	2259	a	Spain, Radio Exterior Espana	9595va	9840va			
2200	2300		Anguilla, Caribbean Beacon	6090am				
2200	2300	vi	Australia, ABC/Alice Springs	4835do				
2200	2300	vi	Australia, ABC/Katherine	5025do				
2200	2300	vi	Australia, ABC/Tennant Creek	4910do				
2200	2300		Australia, Christian Voice	13620pa	17850pa			
2200	2300		Australia, Radio	11880as	15240as	17715va	17795va	21740va
2200	2300		Bulgaria, Radio	5800eu	7500eu			
2200	2300		Canada, CBC Northern Service	9625do				
2200	2300		Canada, CFRX Toronto ON	6070do				
2200	2300		Canada, CFVP Calgary AB	6030do				
2200	2300		Canada, CHNX Halifax, NS	6130do				
2200	2300		Canada, CKZN St John's NF	6160do				
2200	2300		Canada, CKZU Vancouver BC	6160do				
2200	2300		China, China Radio Intl	7175eu				
2200	2300		Costa Rica, R for Peace Intl	15045va	15040al	21815usb		
2200	2300		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
			11870am	13749na	17645as			
2200	2300	mtwhf	Eqt Guinea, Radio Africa	15185af				
2200	2300	f/monthly	Finland, Scandy Weekend Radio	6170va	11720va			
2200	2300	vi	Ghana, Ghana BC Corp	3366do	4915do			
2200	2300	fas/vl	Italy, Italian Radio Relay Svc	3985va				
2200	2300		Malaysia, Radio	7295do				
2200	2300		Namibia, Namibian BC Corp	3270af	3289af			
2200	2300	vi	Nigeria, Radio/Enugu	6025do				
2200	2300	vi	Nigeria, Radio/Ibadan	6050do				
2200	2300	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
2200	2300	vi	Nigeria, Radio/Lagos	3326do	4990do			
2200	2300	vi	Nigeria, Voice of	7255af	15120va			
2200	2300	vi	Solomon Islands, SIBC	5020do	9545do			
2200	2300		Taiwan, Radio Taipei Intl	11565eu	15600eu			
2200	2300		UK, BBC World Service	5965as	5975am	6195na	7105as	9660as
			11835af	11955as	12095sa			
2200	2300		Ukraine, Radio Ukraine Intl	5905eu	7240eu	9560eu		
2200	2300		USA, Armed Forces Radio	6458usb				
2200	2300		USA, KAIJ Dallas TX	13815va				
2200	2300		USA, KTBN Salt Lake City UT		15590na			
2200	2300		USA, KWHR Naalehu HI	17510as				
2200	2300		USA, Voice of America	7215as	9705as	9770as	11760as	15185as
			15290as	15305as	17740as			
2200	2300		USA, WBCQ Monticello ME	7415na	9335na	17495na		
2200	2300		USA, WEWN Birmingham AL	9975eu	11530na	15745na		
2200	2300		USA, WHRA Greenbush ME	7580eu				
2200	2300		USA, WHRI Noblesville IN	5745va	9495am			
2200	2300		USA, WINB Red Lion PA	13570am				
2200	2300		USA, WJCR Upton KY	7490am	13595as			
2200	2300	os	USA, WRMI Miami FL	9955am				
2200	2300		USA, WRNO New Orleans LA	7395am				
2200	2300		USA, WSHB Cypress Crk SC	13770eu	15285sa			
2200	2300		USA, WTJC Newport NC	9370na				
2200	2300		USA, WWCR Nashville TN	7435na	9475na	12160na	13845na	
2200	2300		USA, WWFV McCaysville GA	9400va	12172va			
2200	2300	vi	Vanuatu, Radio	3945do	4960do	7260do		
2200	2300		Zambia, Christian Voice	4965do				
2200	2359		Liberia, Radio Liberia Intl	5100do				
2205	2230		Italy, RAI International	9675as	11900as			
2205	2259	s	Spain, Radio Exterior Espana	9595va	9840va			
2216	2300		New Zealand, Radio NZ Intl	17675pa				
2230	2257		Czech Rep, Radio Prague Intl	7345na	9435af			
2230	2300		Belgium, RVI Flanders R Intl	13685na				
2230	2300		Cuba, Radio Havana	9550am				
2230	2300	mtwhfo	Hungary, Radio Budapest	3975eu				
2230	2300	vi	Papua New Guinea, NBC	4890do	11880irr			
2230	2300		Sweden, Radio	6065va	7325va			
2245	2300		India, All India Radio	9705as	9950as	11620as	13605as	
2245	2300		USA, WYFR Okeechobee FL	11740na				

2300 UTC - 6PM E / 5PM C / 3PM P

2300	0000		Anguilla, Caribbean Beacon	6090am				
2300	0000	vi	Australia, ABC/Alice Springs	4835do				
2300	0000	vi	Australia, ABC/Katherine	5025do				
2300	0000	vi	Australia, ABC/Tennant Creek	4910do				
2300	0000	vi	Cameroon, CRTV Radio Buea	6005do				
2300	0000		Canada, CBC Northern Service	9625do				
2300	0000		Canada, CFRX Toronto ON	6070do				
2300	0000		Canada, CFVP Calgary AB	6030do				
2300	0000		Canada, CHNX Halifax, NS	6130do				
2300	0000		Canada, CKZN St John's NF	6160do				

2300	0000		Canada, CKZU Vancouver BC	6160do				
2300	0000		China, China Radio Intl	5990na	13680na			
2300	0000		Costa Rica, R for Peace Intl	15045va	15040al	21815usb		
2300	0000		Costa Rica, University Network	5030am	6150am	7375am	9925sa	
			11870am	13749na	17645as			
2300	0000		Ecuador, HCJB	11785as				
2300	0000		Egypt, Radio Cairo	9900am				
2300	0000	f/monthly	Finland, Scandy Weekend Radio	6170va	11690va			
2300	0000	vi	Ghana, Ghana BC Corp	3366do	4915do			
2300	0000		India, All India Radio	9705as	9950as	11620as	13605as	
2300	0000		Liberia, Radio Liberia Intl	5100do				
2300	0000		Malaysia, Radio	7295do				
2300	0000		Malaysia, RTM Kata Kinabalu	5980do				
2300	0000		Namibia, Namibian BC Corp	3270af	3289af			
2300	0000		New Zealand, Radio NZ Intl	17675pa				
2300	0000	vi	Papua New Guinea, NBC	4890do	11880irr			
2300	0000		Singapore, SBC Radio One	6150do				
2300	0000	vi	Solomon Islands, SIBC	5020do	9545do			
2300	0000		UK, BBC World Service	3915as	5965as	5975am	6035as	6195as
			7105as	11945as	11955as	12095as	15280as	
2300	0000		USA, Armed Forces Radio	6458usb	12689usb			
2300	0000		USA, KAIJ Dallas TX	13815va				
2300	0000		USA, KTBN Salt Lake City UT		15590na			
2300	0000		USA, KWHR Naalehu HI	17510as				
2300	0000		USA, VOA Special English	7190as	7200as	9545as	11805pa	
			11925as	13735as	13775as			
2300	0000		USA, Voice of America	7215as	9705as	9770as	11760as	15185as
			15290as	15305as	17740as			
2300	0000		USA, WBCQ Monticello ME	7415na	9335na	17495na		
2300	0000		USA, WEWN Birmingham AL	9975eu	11530na	15745na		
2300	0000		USA, WHRA Greenbush ME	7580eu				
2300	0000		USA, WHRI Noblesville IN	5745va	9495am			
2300	0000		USA, WINB Red Lion PA	12160am				
2300	0000		USA, WJCR Upton KY	7490am	13595as			
2300	0000		USA, WRMI Miami FL	9955am				
2300	0000		USA, WRNO New Orleans LA	7355am				
2300	0000		USA, WSHB Cypress Crk SC	13770eu	15285sa			
2300	0000	as	USA, WTJC Newport NC	9370na				
2300	0000		USA, WWCR Nashville TN	5070na	7435na	9475na	13845na	
2300	0000		USA, WWFV McCaysville GA	6890va	9400va			
2300	0000	vi	Vanuatu, Radio	3945do	4960do	7260do		
2300	0000		Zambia, Christian Voice	4965do				
2300	2305	vi	Nigeria, Radio/Enugu	6025do				
2300	2305	vi	Nigeria, Radio/Ibadan	6050do				
2300	2305	vi	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
2300	2305	vi	Nigeria, Radio/Lagos	3326do	4990do			
2300	2330	vi	Australia, Radio	9660pa	11880as	12080va	15240as	17715va
			17795va	21740va				
2300	2330		Cuba, Radio Havana	9550am				
2300	2330	mtwhf	Mexico, Radio Mexico Intl	9705am	11770am			
2300	2345		Germany, Deutsche Welle	9815as	12055as	13610as	21790as	
2300	2345		USA, WYFR Okeechobee FL	11740na				
2300	2350		Turkey, Voice of	9655na	9830va			
2300	2356		Romania, Radio Romania Intl	9750eu	11775eu	11940na	15105	

Notes:

- The BBC World Service Americas stream [BBCWS(am)] is on shortwave at these times and on these frequencies: 1000-1400 on 6195; 0900-1000, 1000-1100 (weekends only) and 1100-1700 on 15190; 1100-1130 on 17790; 2100-0200 on 12095; 2100-0500 on 5975; 0000-0300 on 9915; 0100-0400 on 9525; 0400-0600 on 6135.
- VOA News Now broadcasts are best heard here during the service to Central and South America and the Caribbean at 1000-1100 and 0000-0200 (T-A only). Most VOA features are broadcast during these time periods. The most notable exception is *On the Line*, which discusses official US foreign policy, and is broadcast A at 0633, 1433, 2233 and S 0233, 1033 and 1833. See the MT frequency list for frequencies directed to other areas, some of which are heard well in North America.
- If you're monitoring global newscasts, this month's listings include only longer-form news bulletins. Most transmissions and hours start with news, so referring to the time and frequency section of the MT Guide should be helpful in locating other newscasts of interest.

0000 UTC - Page 43 Freqs

Sunday	
0000 R. Netherlands	Music 52/15 (Martha Hawley presents musical styles from around the globe)
	WBCQ(7415kHz.)
	The Real Amateur Radio Show
0001 BBCWS(am)	Play of the Week (classic and contemporary drama for radio)
0005 R. Australia	The Europeans (historical and cultural perspectives on European societies.)
	Quirks and Quarks (Bob McDonald with what's new and next in science)
	R. Canada Int.
	R. New Zealand Int.
0010 R. Japan	The Film Show (a weekly report on cinema with Jonathan Dennis)
0030 R. Netherlands	Hello from Tokyo (listener letters, music and short features)
	Roughly Speaking (European youth lifestyles magazine)
	R. New Zealand Int.
	Bookmarks (NZ books, literature and writers)
	WBCQ(7415 kHz.)
	Fred Flintstone's Music Show
Monday-Friday	
0005 R. New Zealand Int.	Cadenza (light classical music selections)
Monday	
0000 BBCWS(am)	World Briefing
	WBCQ(7415kHz.)
	Le Show (Harry Shearer with a tour-de-force variety show)
	R. Netherlands
	Dutch Horizons (Bertine Krol chronicles life in Holland)
0005 R. Canada Int.	Global Village (Jawn Taylor fields reports and music from global venues)
0010 R. Australia	Away! (produced and presented by Aboriginal broadcasters, this is Australia's only national indigenous arts and culture program)
	R. Bulgaria
	Folk Studio (Bulgarian folk music)
	R. Japan
	Weekend Square (A program designed to present various aspects of Japan in a friendly and relaxed atmosphere with interviews, music and discussions)
0020 BBCWS(am)	Sports Roundup
0030 BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news program)
	R. Bulgaria
	Bulgarian Plaza (bimonthly cultural magazine)
	Walks and Talks (interesting places in Bulgaria, aired bimonthly)
	R. Netherlands
	The Sound Fountain (interesting topics approached in an unusual way using sound montage, esoteric conversations, inner musings and atmospheric music)
0045 R. Exterior de Espana	Radio Club (a repeat of Saturday's 0035 program.)
Tuesday-Saturday	
0000 R. Exterior de Espana	REE's News Service (featuring international, Ibero-American and national news in-depth, a review of the Spanish press, commentaries and analyses)
	VOA News Now
	News Now (the VOA's continuous rolling news service with analysis, sports, business reports and topical features)[broadcast around the clock, seven days a week; see MT frequency list for frequencies]
0005 BBCWS(am)	Outlook (topical magazine of people, places and events)
0005 R. Canada Int.	As It Happens (continues from Mon.-Fri. 2330)
0015 R. Japan	44 Minutes (daily current affairs magazine about Japan and Asia)
0045 R. Exterior de Espana	Spanish Language Course
Tuesday	
0000 R. Netherlands	The Research File (a magazine emphasizing the relevance

of science to all our lives)
 The Science Show (one of the longest running programs on ABC Radio)
 EuroQuest (a magazine placing Europe in context)
 Encounter (current events debate and discussion)
 Patterns of Faith (a global exploration of religious values and human wisdom)

Wednesday

0000 R. Netherlands
 Music 52/15 (Martha Hawley presents musical styles from around the globe)
 Pat Boone (musical variety)
 0010 R. Australia
 The National Interest (Terry Lane's round-up of the week's major issues)
 0030 R. Netherlands
 A Good Life (how development affects societies)
 0033 VOA News Now
 Our World (the VOA's science, technology agriculture and environment magazine)
 0045 BBCWS(am)
 A Radio History of the World (a series charting the history of conflict from the first wars and empires to today's global security problems)

Thursday
 0000 R. Netherlands
 The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)
 0005 WWCRC(9475kHz.)
 This Week in Americana (magazine on antique collecting)
 0010 R. Australia
 Background Briefing (ABC Radio's award-winning agenda-setting, current affairs radio documentary program)
 0030 R. Canada Int.
 Dispatches (in-depth reports offering a Canadian perspective on international news topics)
 R. Netherlands
 WBCQ(7415kHz.)
 Dutch Horizons (Bertine Krol chronicles life in Holland)
 World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)
 0033 VOA News Now
 0045 BBCWS(am)
 Kaleidoscope (the VOA's arts and culture magazine)
 Heart and Soul (global religious and spiritual experiences)

Friday

0000 R. Netherlands
 The Sound Fountain (interesting topics approached in an unusual way using sound montage, esoteric conversations, inner musings and atmospheric music)
 Goddess Irina 1 Music Show (your guess is as good as mine...ed.)
 0010 R. Australia
 Hindsight (Australian social history woven from the memories of those who were there)
 0030 R. Netherlands
 The Research File (a magazine emphasizing the relevance of science to all our lives)
 0033 VOA News Now
 Best of "Talk to America" (excerpts from previous editions of this VOA listener phone-in)
 0045 BBCWS(am)
 What's the Problem (a panel of experts offers advice to listeners who write in with their problems)

Saturday

0000 R. Netherlands
 A Good Life (how development affects societies)
 0000 WBCQ(7415kHz.)
 The Last Discs Radio Show (spinning obscure oldies)
 0005 R. Australia
 Feedback (Roger Broadbent answers listener questions and provides regular updates about RA)
 0010 R. New Zealand Int.
 Home Grown (Liz Barry plays contemporary Kiwi music)
 0030 R. Australia
 Country Breakfast (an entertaining look at Australian rural and regional issues with Belinda Varischere)
 R. Netherlands
 The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)
 R. New Zealand Int.
 Musical Chairs (the music and background of a featured NZ musician)
 0033 VOA News Now
 Press Conference USA ('Meet the Press' for shortwave)
 0035 R. Exterior de Espana
 Radio Club (answering listeners' letters)
 0045 BBCWS(am)
 It's a Girl! (how different societies react to the birth of a girl and what is being done to improve women's lives)
 R. Exterior de Espana
 Radio Waves (a weekly program for radio enthusiasts)

0100 UTC - Page 43 Freqs

Sunday	
0100 BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news program)
	HCB Ecuador
	JX Partyline (Allen Graham hosts a weekly program for DXers and SWLs)
	WBCQ(7415kHz.)
	A Different Kind of Oldies Show (a unique mix. of oldies music with "Big Steve" Cole)
	The Bible on Tape
	DXing with Cumbre (Marie Lamb with the hottest DX catches)
0105 Deutsche Welle	"talking Point (European journalists discuss the week's events)
R. Australia	Correspondents' Report (ABC News reporters background international events)
0105 R. Netherlands	Wide Angle (a weekly in-depth look at a news topic)
R. New Zealand Int.	Eureka! (Allan Coukell reports on science in NZ)
R. Prague	Readings from Czech Literature
0110 R. Prague	Saturday Music (Czech classical, folk, jazz or rock music)
0115 Deutsche Welle	Inside Europe (a weekly magazine exploring the topical issues shaping the continent)
0120 China R. Int.	In the Spotlight (Chinese arts and cultural magazine)
0130 BBCWS(am)	Reporting Religion (the week's religious news)
HCB Ecuador	Saludos Amigos (Yvonne Kennedy and Sharon Bulmer host this popular program of international friendship)
R. Australia	Oz Sounds (Australian new music releases)

R. New Zealand Int
 RTE Ireland
 0140 R. Habana Cuba
 0145 BBCWS(am)

Monday-Friday

0105 R. New Zealand Int.
 In Touch with New Zealand (a domestic afternoon variety program hosted by Wayne Mowat; this hour features popular music set to a theme)
 0110 R. Australia
 Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
 0115 China R. Int
 Current Affairs (reports and comment on events and issues)

Monday
 0100 BBCWS(am)
 The World Today (the BBC's agenda-setting flagship global news program)
 HCB Ecuador
 Musical Mailbag (listener letters, food and the question of the week)
 R. Habana Cuba
 WBCQ(7415kHz.)
 Weekly Review (Cuba's perspective on current events)
 Radio New York International (Johnny Lightning plays classic rock)
 WWCRC(3215kHz.)
 0145 Deutsche Welle
 World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)
 Religion and Society (an insight into religious events around the world)
 R. Netherlands
 WWCRC(5070kHz.)
 01:5 Deutsche Welle
 Arts on the Air (Breandain O'Shea covers the German cultural scene)
 01:0 China R. Int.
 People in the Know (interviews with prominent Chinese who are shaping the nation's future)
 R. Australia
 The Health Report (Dr Norman Swan's weekly report on health and medical issues)
 RTE Ireland
 0140 R. Habana Cuba
 0150 R. Habana Cuba
 Tuesday-Saturday
 0160 R. Exterior de Espana

REE's News Service (featuring international, Ibero-American and national news in-depth, a review of the Spanish press, commentaries and analyses)
 Newsline (news, analysis and background reports)
 News Now (the VOA's continuous rolling news service with analysis, sports, business reports and topical features)[broadcast around the clock, seven days a week; see MT frequency list for frequencies]
 Newslink (daily current affairs magazine focused on Europe)
 0105 Deutsche Welle
 0110 HCB Ecuador
 0130 RTE Ireland
 0145 R. Exterior de Espana
 0155 VOA News Now

Tuesday

0100 WWCRC(3215kHz)
 0105 BBCWS(am)
 0130 BBCWS(am)
 China R. Int.
 Deutsche Welle
 R. Australia

Keen on Jazz
 Meridian-Masterpiece (critical examinations of creative endeavors)
 Music Mix (insights into current popular music)
 Sports World (comprehensive coverage of sports in China and Asia)
 Insight (a look at major international trends and developments)
 The Law Report (Dorrien Carrick presents breaking legal stories in Australia and overseas)

Wednesday

0100 WBCQ(7415kHz.)
 0105 BBCWS(am)
 0130 BBCWS(am)
 Deutsche Welle
 R. Australia
 0140 R. Habana Cuba

Off the Hook
 Meridian-Screen (interviews, documentaries, features and discussions on the film arts)
 UK Top Twenty (music from the British rock and pop charts)
 Man and Environment (John Hay presents the human element in environmental issues.)
 The Religion Report (Lyn Gallacher examines the way religion and societies interact)
 DXers Unlimited (Arnie Caro presents a program from radio enthusiasts.)

Thursday

0105 BBCWS(am)
 0130 BBCWS(am)
 Deutsche Welle
 R. Australia
 0145 BBCWS(am)
Friday
 0100 WBCQ(7415kHz.)
 0105 BBCWS(am)
 WWCRC(9475kHz.)
 0115 Deutsche Welle

Mendion-Music (an in-depth look at classical music of the world)
 Westway (a twice-weekly radio soap opera)
 Living in Germany (people, places and events in Germany)
 The Media Report (Mick O'Regan takes a critical look at the latest developments in the communications industry)
 UK Album Chart (music from Britain's most popular CDs)
 Everybody's Uncle
 Meridian-Writing (reports on books, theatre, poetry, journalism, biography, history and anthropology)
 This Week in Americana (magazine on antique collecting)
 Hard to Boat - The World of Sport (weekly report on German and European sport)

Shortwave Guide



0130 BBCWS(am) World of Music (the best of folk, non-Western classical and non-Western popular music)
 R. Australia The Sports Factor (Amanda Smith presents reports which debate and celebrate the cultural significance of sport)
Saturday
 0100 WBCQ(7415kHz) Allan Weiner Worldwide (the station manager's show)
 0105 BBCWS(am) Omnibus (a weekly documentary feature program that tackles any topic across the globe)
 R. Australia Asia-Pacific Weekend Edition (a weekly current events and business report for and about Asia and the Pacific region)
 R. New Zealand Int Home Grown (continues from 0010)
 0120 China R. Int. Listeners' Garden (letters, touring, cooking and a language lesson)
 0130 BBCWS(am) Westway (a radio soap opera)
 Deutsche Welle German by Radio (a language lesson)
 R. Australia Arts Talk (Julie Copeland presents the world of arts and cultural ideas)
 0133 VOA News Now Communications World (Kim Elliott reviews the week in global communications) [also broadcast at 0533, 0933, 1333, 1733, 2133, see MT frequency list for frequencies]
 0135 R. Exterior de Espana Radio Club (answering listeners' letters)
 0145 BBCWS (am) Revolver (each week a different presenter reviews some recent releases that have caught their ear, from metal to country, from indie to rhythm and blues)
 R. Exterior de Espana Radio Waves (a weekly program for radio enthusiasts)
 VOA Special English American Stories (short stories by American authors)

0200 UTC - Page 43 Freqs

Daily
 0230 R. Austria Int Report from Austria (a daily magazine focusing on Austria and central and eastern Europe)
Sunday
 0200 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)
 WBCQ(7415kHz) Marion's Attic (rare and vintage recordings presented by Marion Webster)
 0205 R. Australia Margaret Throsby (a guest is interviewed and presents favorite musical pieces)
 R. Prague Readings from Czech Literature
 R. New Zealand Int Program on Maori history, culture or issues
 0210 R. Canada Int. Business Sense (an in-depth look at Canadian companies in the global economy)
 R. Prague Saturday Music (Czech classical, folk, jazz or rock music)
 0211 Voice of Russia News and Views (Russian views on news developments)
 0215 R. Taipei Int. Great Wall Forum (the China-Taiwan issue from Taipei's perspective)
 0230 BBCWS(am) From Our Own Correspondent (the background to international events from BBC correspondents around the world)
 R. Sweden Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)
 Sweden Today (George Wood presents the voices of Sweden, the second week of the month)
 Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)
 Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)
 WWCR(5070kHz) New Horizons (2001 NY International Radio Award winning program reporting on breakthrough discoveries in science, medicine and technology)
 0232 Voice of Russia Moscow Yesterday and Today (recalling the most interesting events in the history of the city)
 0235 R. Austria Int Radia E (A weekly magazine on Europe jointly produced by the BBC and other European broadcasters)
 R. Canada Int Canada in the World (Wojtek Gwiazda hosts a weekly magazine examining Canadian policies, priorities and international relations)
 R. Habana Cuba The World of Stamps (This just might be the only program on radio on philatelic matters)
 R. New Zealand Int. The Band Programme (John Harrison presents music from the world of brass)
 0245 WWCR(5070kHz) Ask WWCR
Monday-Friday
 0205 R. New Zealand Int. In Touch with New Zealand (continues from 0105, this hour includes interviews, reports and music)
 0210 R. Australia The World Today (a comprehensive current affairs program with Monica Attard and John Highfield)
 0245 R. Taipei Int. Lei's Learn Chinese
Monday
 0200 WBCQ(7415kHz) Radio New York International (continues from 0100)
 0205 BBCWS(am) Wright Around the World (Steve Wright puts the best e-mails, letters, answer machine messages and faxes on the air while playing musical requests)
 R. Budapest Spotlight (a monthly magazine)[1st M]
 Europe Unlimited (Hungary's relations with the rest of Europe)[2nd M]
 Heading for Hungary (a monthly travelogue)[3rd M]
 And the Gatepost (listener letters)[4th M]
 0210 R. Canada Int The Maple Leaf Mailbag (Ian Jones answers listener mail and

R. Habana Cuba hosts the fortnightly CIDX Report for dazers)
 From Havana (a showcase of contemporary Cuban music and musicians)
 0215 R. Taipei Int. Jade Bells and Bamboo Pipes (Carson Wong introduces selections of traditional Chinese music)
 0230 R. Habana Cuba The Jazz Place (the very best of Cuban jazz)
 R. Sweden In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hogström)
 Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first)
 WRM(73B5kHz) Wavescan (Adventist World Radio's swl program)
 0232 Voice of Russia Timelines (Estelle Winters' variety show giving insight into life in Moscow through foreign eyes)
 0235 R. Canada Int Spotlight (a magazine touching on all facets of artistic and cultural life in Canada)
Tuesday-Saturday
 0210 R. Budapest Hungary Today (daily magazine covering current events in Hungary)
 R. Canada Int Canada Today (daily magazine of interviews, correspondents' reports and Canadian views on world and national events)
 0211 Voice of Russia Commonwealth Update (comments on domestic developments and major domestic issues)
 0230 R. Sweden Sixty Degrees North (reports, interviews and analysis on the Nordic region)
Tuesday
 0205 BBCWS(am) Health Matters (reports on the latest research explaining where medicine is going)
 0230 BBCWS(am) Everywoman (the BBC's international magazine for women)
 0232 Voice of Russia Folk Bar (music drawn from the traditions of the hundreds of nationalities that make up Russia and the CIS)
 0235 R. Canada Int. Media Zone (Ian Jones hosts a weekly forum with Canadian journalists discussing topical issues facing Canadians)
 Sports Scan (a weekly report on sports in the Nordic region)
 0245 R. Sweden The Book and the Spade (the latest discoveries and developments in Biblical archaeology)
Wednesday
 0200 HCB Ecuador Go Digital (technology journalist Tracey Logan explains the latest in IT)
 0205 BBCWS(am) Focus on Faith (Trevor Barnes looks at the religious stories behind the news)
 0230 BBCWS(am) The Jazz Show (recordings from the Russian world of jazz)
 0232 Voice of Russia Spotlight (a magazine touching on all facets of artistic and cultural life in Canada)
 0245 R. Sweden Close Up (profiles of people in Sweden from all walks of life)
Thursday
 0205 BBCWS(am) Sports International (the issues and personalities behind the headlines)
 0215 R. Taipei Int. Journey into Chinese Culture
 0230 BBCWS(am) Pick of the World (Daire Brahan presents World Service highlights and talks with the producers and presenters of BBC programs)
 0232 Voice of Russia Folk Bar (music drawn from the traditions of the hundreds of nationalities that make up Russia and the CIS)
 0235 R. Canada Int. The Maple Leaf Mailbag (Ian Jones reads listener letters and answers their questions)[The CIDX Report is included fortnightly]
 Money Matters (a weekly economic report on the Nordic region)
Friday
 0205 BBCWS(am) One Planet (stories about the environment, development, agriculture and human impact on the natural world)
 0230 BBCWS(am) People and Places (a forum for the exchange of views and experiences on a global scale)
 0235 R. Canada Int. Business Sense (an in-depth look at Canadian companies in the global economy)
 0245 R. Sweden Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)
 Greenscan (Azariah Kuros highlights Swedish environmental awareness and challenges the second week of the month)
 Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)
 The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)
Saturday
 0200 WBCQ(7415kHz) Tasha Takes Control (upbeat progressive music)
 0205 BBCWS(am) Discovery (in-depth exploration of ideas and discoveries in science and technology)
 R. New Zealand Int Program or series on music
 0210 R. Australia Background Briefing (ABC Radio's award-winning agenda-setting, current affairs radio documentary program)
 0230 BBCWS(am) Essential Guide (the biggest developments, issues and names in global affairs)
 WWCR(3215kHz) Ken's Country Classics (classic country music)
 0235 R. Canada Int Canada in the World (Wojtek Gwiazda hosts a weekly magazine examining Canadian policies, priorities and international relations)

0300 UTC - Page 43 Freqs

Daily
 0300 BBCWS(am) World Briefing
 0320 BBCWS(am) Sports Roundup
Sunday
 0300 HCB Ecuador Inspirational Classics (classical music inspired by religious and spiritual themes)
 WBCQ(7415kHz) Radio Detective (program on antique radio restoration)
 WWCR(5070kHz) Communications World (Kim Elliott reviews the week in global communications)
 0305 R. Australia Feedback (Roger Broadbent answers listener questions and provides regular updates about RA)
 R. New Zealand Int. Playhouse (classic and contemporary radio drama from around the world)
 0311 Voice of Russia Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow)
 0315 Deutsche Welle Spectrum (a weekly program looking at developments in the fields of science and technology)
 0320 China R. Int In the Spotlight (Chinese arts and cultural magazine)
 0330 BBCWS(am) Science in Action (Richard Black reports news from the worlds of science and technology)
 R. Australia Octham's Razor (sharp commentaries on scientific issues)
 R. Sweden Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)
 Sweden Today (George Wood presents the voices of Sweden, the second week of the month)
 Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)
 Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)
 This Lousy Half-Hour Show (Charlie Kaufman with an eclectic selection of music)
 World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)
 0332 Voice of Russia Songs from Russia (melodies and musical novelties from Russia's past)
 0340 R. Habana Cuba DXers Unlimited (Amie Caro presents a program from radio enthusiasts)
Monday-Friday
 0300 R. New Zealand Int. Pacific Regional News
 0315 China R. Int. Current Affairs (reports and comment on events and issues)
Monday
 0300 R. Habana Cuba Weekly Review (Cuba's perspective on current events)
 WBCQ(7415kHz) Radio New York International (continues from 0100)
 WWCR(3215kHz) Keen on Jazz
 0305 R. New Zealand Int. Tagata a te Moana (Anita Purcell presents a weekly Pacific magazine with NZ and regional Pacific news, issues, information and music)
 0310 R. Bulgaria Folk Studio (Bulgarian folk music)
 0311 Voice of Russia Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow)
 0315 Deutsche Welle Arts on the Air (Breandain O'Shea covers the German cultural scene.)
 0330 BBCWS(am) Assignment (documentaries that delve behind the headlines to find out how news events affect people's everyday lives)
 China R. Int. People in the Know (interviews with prominent Chinese who are shaping the nation's future)
 R. Bulgaria Bulgarian Plaza (bimonthly cultural magazine)
 R. Sweden Walks and Talks (interesting places in Bulgaria, aired bimonthly)
 In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hogström)
 Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first)
 0332 Voice of Russia This is Russia (the cities and regions, culture and the arts, the countryside, religion and people)
 0335 R. Budapest Spotlight (a monthly magazine)[1st M]
 Europe Unlimited (Hungary's relations with the rest of Europe)[2nd M]
 Heading for Hungary (a monthly travelogue)[3rd M]
 And the Gatepost (listener letters)[4th M]
 0340 R. Australia The Australian Music Show (the latest rock music from the Triple J youth network of the ABC)
 R. Habana Cuba The Mailbag Show (listener letters)
Tuesday-Saturday
 0350 R. Habana Cuba Breakthrough (Amie Caro's weekly science report)
 0305 Deutsche Welle Newslink (daily current affairs magazine focused on Europe)
 0310 R. Bulgaria Events and Developments (reports, analyses and commentary on Bulgarian and Balkan events)
 0330 BBCWS(am) World Business Report (a guide through the main business issues of the day)
 R. Sweden Sixty Degrees North (reports, interviews and analysis on the Nordic region)

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0335 R. Budapest Hungary Today (a daily magazine covering current events in Hungary)

Tuesday
0305 R. New Zealand Int. Top Five and New Releases (the top five singles and new music releases in NZ with Greg Tatera)

0311 Voice of Russia Science and Engineering (reports on the latest developments in science and technology)

0315 Radio Taipei Int. Taiwan Economic Journal

0330 China R. Int. Sports World (the sports scene in China and Asia)
Deutsche Welle Insight (a look at major international trends and developments)

0332 Voice of Russia Kaleidoscope (the latest economic, social and cultural events in Russia and the CIS)

0340 R. Australia Music Deli (Austrian performances of folk, acoustic, traditional and world music)

0345 BBCWS(am) R. Sweden Analysis (background to the stories in the news)
Sports Scan (a weekly report on sports in the Nordic region)

Wednesday
0305 R. New Zealand Int. Pacific Report (RNZI correspondent Don Wiseman interviews and reports on regional matters)

0311 Voice of Russia Newmarket (news about business in Russia and Russia's involvement in international business)

0330 Deutsche Welle Man and Environment (John Hay presents the human element in environmental issues.)
R. New Zealand Int. Tradewinds (Walter Zweifel with a weekly report on Pacific regional business and economic news)

0340 R. Australia Blacktracker (Mal Honess presents contemporary Aboriginal music)

R. Habana Cuba DXers Unlimited (Arnie Caro presents a program from radio enthusiasts)

0345 BBCWS(am) R. Sweden Analysis (background to the stories in the news)
Close Up (profiles of people in Sweden from all walks of life)

Thursday
0305 R. New Zealand Int. RNZI Talk (a fortnightly introduction to the RNZI and National Radio staff, along with RNZI developments, projects and programmes)
Mailbag (a fortnightly program aimed at the serious shortwave listener, with Myra Oh answering letters, Paul Ormandy reporting the latest DX news, and Frequency Manager Adron Sainsbury answering technical questions)

0311 Voice of Russia Moscow Mailbag (YOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow.)

0330 Deutsche Welle The World in Sport (Dmitri Edwards presents highlights of the world's sporting week with emphasis on NZ and the Pacific)
R. New Zealand Int. Moscow Yesterday and Today (recalling the most interesting events in the history of the city)

0332 Voice of Russia Oz Country Style (country music from Australia)

0340 R. Australia From Our Own Correspondent (the background to international events from BBC correspondents around the world)

0345 BBCWS(am) R. Sweden Money Matters (a weekly economic report on the Nordic region)

Friday
0305 R. New Zealand Int. Dateline Pacific (the major Pacific stories of the week, with background and reaction from the people making the news, presented by Don Wiseman)

0311 Voice of Russia Science and Engineering (reports on the latest developments in science and technology)

0330 China R. Int. Life in China (a weekly magazine focusing on the lives of ordinary people in China)
Deutsche Welle Hard to Beat: The World of Sport (weekly report on German and European sport)
HCB Ecuador The Book and the Spade (the latest discoveries and developments in Biblical archaeology)
R. New Zealand Int. Pacific Correspondent (RNZI's regional correspondents talk to Don Wiseman about political and social issues in their respective Pacific countries)

0332 Voice of Russia Russian by Radio (a language lesson)

0340 R. Australia Jazz Notes (Australian jazz presented by Ivan Lloyd)

0345 BBCWS(am) Analysis (background to the stories in the news)

0345 R. Sweden Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)
Greenscan (Azariah Kiras highlights Swedish environmental awareness and challenges the second week of the month)
Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)
The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)

Saturday
0300 WWCR(3215kHz.) World of Radio (Glenn Houser's comprehensive review of the week in shortwave and international broadcasting)

0305 R. Australia Rural Reporter (ABC's rural reporters present news and stories from rural and regional Australia)
R. New Zealand Int. Togata to te Moana (Anita Purcell presents a weekly Pacific magazine with NZ and regional Pacific news, issues, information and music)

0311 Voice of Russia Newmarket (news about business in Russia and Russia's involvement in international business)

0320 China R. Int. Listeners' Garden (letters, touring, cooking and a language lesson)

0330 Deutsche Welle German by Radio (a language lesson)
HCB Ecuador Walkin' in the Sunshine (Ben Cummings with the roots of country music)
R. Australia Educational series (a series of documentary programs dealing with Asian or Pacific history, politics or communications. Specific details were unavailable at deadline)

0332 Voice of Russia Audio Book Club (readings from the best of Russian classic and contemporary literature)
Analysis (background to the stories in the news)

0400 UTC - Page 44 Freqs

Sunday
0400 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)
HCB Ecuador DX Partyline (Allen Graham hosts a weekly program for DXers and SWLs)
R. Vlaanderen Int. Music from Flanders (a half-hour of Flemish music, musicians and musical performances)
WWCR Cyber Line (musings on the new technologies)

0405 R. Australia Pacific Focus-Arts (reports on culture and the arts in the Pacific region)
R. New Zealand Int. Whenua! (Maori cultural magazine)
R. Prague Readings from Czech Literature
0410 R. New Zealand Feature or series on NZ religious and spiritual matters
R. Prague Saturday Music (Czech classical, folk, jazz or rock music)

0420 China R. Int. In the Spotlight (Chinese arts and cultural magazine)

0430 BBCWS(am) Global Business (Peter Day charts the transformations sweeping through the world of work and commerce)
HCB Ecuador Saludos Amigos (Yvonne Kennedy and Sharon Bulmer host this popular international friendship program)
R. Australia Arts Talk (Julie Copeland presents the world of arts and cultural ideas)

0432 Voice of Russia Kaleidoscope (the latest economic, social and cultural events in Russia and the CIS)

0435 R. Habana Cuba The World of Stamps (This just might be the only program on radio on philatelic matters)
R. Netherlands Europe Unziped (the events of the past week in Europe, some unusual)

0445 R. Habana Cuba 40th Anniversary of RHC (special reports on the history of the station)
WWCR(3215kHz.) Money Matters (the latest business and financial innovations)

0455 R. Netherlands Insight (Rob Green casts a critical and humorous eye on the past week's headlines)

Monday-Friday
0400 R. New Zealand Int. Checkpoint (RNZ National Radio's flagship evening news program)
R. Australia Margaret Throsby (a guest is interviewed and presents favorite musical pieces)
Current Affairs (reports and comment on events and issues)

0415 China R. Int. The World Today (the BBC's agenda-setting flagship global news program)
HCB Ecuador Musical Mailbag (listener letters, food and the question of the week)
R. Vlaanderen Int. Radio World (Frans Vossen presents a weekly report about international radio)
0400 WBCQ(7415kHz.) Radio New York International (continues from 0100)
0410 R. Habana Cuba From Havana (a showcase of contemporary Cuban music and musicians)
0430 BBCWS(am) Westway Omnibus (an opportunity to hear again both episodes of this radio drama serial broadcast last week)
China R. Int. People in the Know (interviews with prominent Chinese who are shaping the nation's future)
R. Habana Cuba The Jazz Place (the very best of Cuban jazz)
WWCR(5070kHz.) The Old Record Shop (vintage recordings)

0432 Voice of Russia Audio Book Club (readings from the best of Russian classic and contemporary literature)
Sincerely Yours (Howard Shannon and Neville Powis host RN's listener response program.)
The Week Ahead (on RN the next seven days)

0455 R. Netherlands Studio 9 (daily magazine with focused reports on Latin America)
Tuesday-Saturday
0410 HCB Ecuador News and Views (Russian views on news developments)
0411 Voice of Russia Newswire (news, analysis and background reports)
0430 R. Netherlands Off the Shelf (abridged serialized readings of novels, stories and other literature)

0445 BBCWS(am) Panel game or Quiz show (with the title of Brain of Britain 2001 settled, the BBC offers another of its popular light entertainment features)

0430 BBCWS(am) It's a Girl! (how different societies react to the birth of a girl and what is being done to improve women's lives)
China R. Int. Sports World (the sports scene in China and Asia)

Wednesday
#405 BBCWS(am) John Peel (an eclectic mix of music)
#430 BBCWS(am) Patterns of Faith (a global exploration of religious values and human wisdom)

Thursday
0405 BBCWS(am) The Greenfield Collection (Edward Greenfield plays classical music requests and selections drawn from his own collection)
0430 BBCWS(am) A Radio History of the World (a series charting the history of conflict from the first wars and empires to today's global security problems)

Friday
0405 BBCWS(am) Jazzmatz (a weekly jazz magazine)
0430 BBCWS(am) Heart and Soul (global religious and spiritual experiences)
China R. Int. Life in China (a weekly magazine focusing on the lives of ordinary people in China)

Saturday
0405 BBCWS(am) Composer of the Month (the life, career and music of a selected composer)
R. Australia Pacific Focus-Environment (the past week's environmental news as reported on the weekly magazine, Pacific Beat)
0412 R. New Zealand Int. The Best of Kim Hill (highlights from her interviews and conversations over the past week)
0420 China R. Int. Listeners' Garden (letters, touring, cooking and a language lesson)
0430 BBCWS(am) Write On (Penny Vine sifts through the listener mail)
R. Australia From Where I Stand (audio diaries about modern British society) aired the second or third week of the month in place of Write On)
The Buzz (the week's big technology news and issues presented by Richard Aedy)

0500 UTC - Page 45 Freqs

Sunday
0500 HCB Ecuador Inspirational Classics (classical music inspired by religious and spiritual themes)
R. Netherlands Music 52/15 (Martha Hawley presents musical styles from around the globe)
WBCQ(7415kHz) Tom and Darryl (discussions about satellite, shortwave, LPFM and Internet communications) [1st/3rd S]
0505 BBCWS(am) Wright Around the World (Steve Wright puts the best e-mails, letters, answer machine messages and faxes on the air while playing musical requests)
Deutsche Welle Talking Point (European journalists discuss the week's events.)
R. Australia Pacific Focus-Sports (reports on sport in the Pacific region)
R. New Zealand Int. Whenua! (people, issues, music and comment in Aotearoa-the Maori name for NZ-with Henare te Ua and Libby Hakarua)
0510 R. Japan Pop! Goes Asia (a look at Asia as it is now, presenting the cultures and lifestyles of other Asian countries through their popular music)

0515 Deutsche Welle Marks and Markets (DW's weekly financial magazine highlighting business in Europe)

0530 R. Australia Fine Music Australia (Australian classical music performances)

0532 Voice of Russia Timelines (Estelle Wintars' variety show giving insight into life in Moscow through foreign eyes)
R. Habana Cuba DXers Unlimited (Arnie Caro presents a program from radio enthusiasts)

Monday-Friday
0500 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)
WBCQ(7415kHz.) Amos 'n Andy (the classic radio comedy from America's radio past)

0507 R. New Zealand Int. What's Going On? (a daily update on entertainment and the arts in NZ)

0510 R. Australia Pacific Beat (one of RA's primary programs, this daily current events and features magazine focuses in on the Pacific island nations)
44 Minutes (current affairs magazine about Japan and Asia)

0515 R. Japan 44 Minutes (current affairs magazine about Japan and Asia)

0545 R. New Zealand Int. Storytime (a children's program)

Monday
0500 R. Habana Cuba Weekly Review (Cuba's perspective on current events)
R. Netherlands Dutch Horizons (Bertine Kool chronicles life in Holland)
0505 Deutsche Welle Religion and Society (an insight into religious events around the world)

0515 Deutsche Welle Cool (Erica Gingrich and Anke Rasper present DW's youth magazine with reports on the attitudes, music and style of young Europe)

0530 R. New Zealand Int. Letter from America (Alistair Cooke's weekly BBC commentary)
WWCR(5070kHz.) New Horizons (2001 NY International Radio Award winning program reporting on breakthrough discoveries in science, medicine and technology)

0532 Voice of Russia The Jazz Show (recordings from the Russian world of jazz)

0540 R. Habana Cuba The Mailbag Show (listener letters)

0545 R. Exterior de Espana Radio Club (a repeat of Saturday's program)
WWCR(5070kHz.) Ask WWCR

0550 R. Habana Cuba Breakthrough (Arnie Caro with a report on science)

Tuesday-Saturday
0500 R. Exterior de Espana REE's News Service (featuring international, Ibero-American

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		and national news in-depth, a review of the Spanish press, commentaries and analyses)
0505	Deutsche Welle	Newslink (daily current affairs magazine focused on Europe)
0545	R. Exterior de Espana	Spanish Language Course
Tuesday		
0500	R. Netherlands	The Research File (a magazine emphasizing the relevance of science to all our lives)
0511	Voice of Russia	Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow)
0530	Deutsche Welle	Insight (a look at major international trends and developments)
	R. New Zealand Int.	Today in Parliament
Wednesday		
0500	R. Netherlands	Music 52/15 (Martha Hawley presents musical styles from around the globe)
0511	Voice of Russia	Science and Engineering (reports on the latest developments in science and technology)
0530	Deutsche Welle	Man and Environment (John Hay presents the human element in environmental issues)
	R. New Zealand Int.	Today in Parliament
0532	Voice of Russia	Moscow Yesterday and Today (recalling the most interesting events in the history of the city)
0540	R. Habana Cuba	DXers Unlimited (Arnie Cora presents a program for radio enthusiasts.)
Thursday		
0500	R. Netherlands	The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)
0511	Voice of Russia	Newmarket (news about business in Russia and Russia's involvement in international business)
0515	WBCQ(7415kHz.)	World of Radio (Glenn Hauser's comprehensive review of the week in showwave and international broadcasting)
0530	Deutsche Welle	Living in Germany (people, places and events in Germany)
	R. New Zealand Int.	Today in Parliament
0532	Voice of Russia	Folk Box (music drawn from the traditions of the hundreds of nationalities that make up Russia and the CIS)
Friday		
0500	R. Netherlands	The Sound Fountain (interesting topics approached in an unusual way using sound montage, esoteric conversations, inner musings and atmospheric music)
0511	Voice of Russia	Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow)
0530	Deutsche Welle	Hard to Beat: The World of Sport (weekly report on German and European sport)
	HCB Ecuador	The Book and the Spade (the latest discoveries and developments in Biblical archaeology)
	R. New Zealand Int.	Pacific Report (RNZI correspondent Don Wiseman interviews and reports on regional matters)
0532	Voice of Russia	Audio Book Club (readings from the best of Russian classic and contemporary literature)
Saturday		
0500	The World Today (the BBC's agenda-setting flagship global news program)	
	R. Netherlands	A Good Life (how development affects societies)
	WBCQ(7415kHz.)	Amos 'n Andy (the classic radio comedy from America's radio past)
0505	R. Australia	Pacific Focus-Sport (the week's sports news as reported on the daily magazine "Pacific Beat")
	R. New Zealand Int.	Focus on Politics (issues explored by the RNZ Parliamentary news team)
0510	R. Japan	Hello from Tokyo (listener letters, music and short features)
0511	Voice of Russia	Science and Engineering (reports on the latest developments in science and technology)
0525	R. New Zealand Int.	In a Mellow Tone (Hayden Shirley plays easy listening jazz from a selection of NZ and overseas artists)
0530	BBCWS(am)	Arts in Action (architects, playwrights, musicians and poets explain the ideas that shape our aesthetic, musical and literary worlds)
	Deutsche Welle	German by Radio (a language lesson)
	HCB Ecuador	Walkin' in the Sunshine (Ben Cummings with the roots of country music)
	R. Australia	Lingua Franca (a program about language and its social, cultural and historical ramifications)
0532	Voice of Russia	Timelines (Estelle Winters' variety show giving insight into life in Moscow through foreign eyes)
0535	R. Exterior de Espana	Radio Club (answering listeners' letters)
0545	R. Exterior de Espana	Radio Waves (a weekly program for radio enthusiasts)

0600 UTC - Page 45 Freqs

Sunday		
0600	WWCR(5070kHz)	Keen on Jazz
0605	R. Australia	The Europeans (historical and cultural perspectives on European societies.)
	R. New Zealand Int.	Future Indicative (a program of special interest to people with disabilities)
0610	R. Japan	Weekend Square (A program designed to present various aspects of Japan in a friendly and relaxed atmosphere with interviews, music and discussions.)

0635	R. Habana Cuba	The World of Stamps (This just might be the only program on radio on philatelic matters)
	R. New Zealand Int.	This Week in Parliament
Monday-Friday		
0615	R. Japan	Asian Top News (the day's major stories as reported by the region's radio stations)
0620	R. Australia	Pacific Focus (daily regional report concentrating each weekday on a different theme - business, health, environment, sport and culture)
Monday		
0600	WWCR(3210kHz.)	World of Radio (Glenn Hauser's comprehensive review of the week in showwave and international broadcasting)
0605	R. New Zealand Int.	Eureka! (Allan Coukell reports on science in NZ)
0610	R. Habana Cuba	From Havana (a showcase of contemporary Cuban music and musicians)
0625	R. Japan	Unforgettable Musical Masterpieces (a focus on Japanese pop songs written in the past war years as a means of explaining Japanese history and attitudes)
0630	R. Habana Cuba	The Jazz Place (the very best of Cuban jazz)
	R. New Zealand Int.	Health Matters or Environment Matters (series alternate)
	WWCR(3210kHz.)	Communications World (Kim Elliott reviews the week in global communications)
0640	R. Australia	The Australian Music Show (the latest rock music from the Triple J youth network of the ABC)
Tuesday-Saturday		
0600	x?WWCR(3210kHz)	World Wide Country Radio (country music)
Tuesday		
0600	WWCR(5070kHz.)	Ask WWCR
0605	R. New Zealand Int.	The Best of John Campbell (a reprise of some of the interviews and features from National Radio's Saturday morning program)
	WWCR(3215kHz)	The Golden Age of Radio Theatre (classic American radio programs)
0625	R. Japan	Let's Learn Japanese (a Japanese language lesson for beginners)
0640	R. Australia	Music Deli (Australian performances of folk, acoustic, traditional and world music)
Wednesday		
0605	R. New Zealand Int.	Musical Chairs (the music and background of a featured NZ musician)
	WWCR(3215kHz)	The Golden Age of Radio Theatre (classic American radio programs)
0625	R. Japan	Japan Music Log
0640	R. Australia	Blacktracker (Mal Honess presents contemporary Aboriginal music)
Thursday		
0605	R. New Zealand Int.	Bookmarks (NZ books, literature and writers)
	WWCR(3215kHz)	The Golden Age of Radio Theatre (classic American radio programs)
0625	R. Japan	Brush Up Your Japanese (an intermediate course in Japanese)
0640	R. Australia	Oz Country Style (country music from Australia)
Friday		
0605	R. New Zealand Int.	Country Life (news and views from rural NZ)
	WWCR(3215kHz)	The Golden Age of Radio Theatre (classic American radio programs)
0625	R. Japan	Music Beat (contemporary Japanese popular music)
0630	R. New Zealand Int.	Dateline Pacific (the major Pacific stories of the week, with background and reaction from the people making the news, presented by Don Wiseman)
0640	R. Australia	Jazz Notes (Australian jazz presented by Ivan Lloyd)
Saturday		
0600	WHRI(7315kHz.)	DXing with Cumbre (Marie Lamb with the hottest DX catches)
0605	R. New Zealand Int.	Saturday Night (music, reminiscences and entertainment)(continues to 1000)
	WWCR(3210kHz.)	Rock the Universe (Christian rock music)
0610	R. Japan	Pop! Goes Asia (a look at Asia as it is now, presenting the cultures and lifestyles of other Asian countries through their popular music)
0630	R. Australia	Oz Sounds (Australian new music releases)

1100 UTC - Page 48 Freqs

Daily		
1100	BBCWS(am)	World Briefing
Sunday		
1105	R. Australia	Correspondents Report (The ABC's overseas reporters give their interpretation and analysis of the week's major events)
1110	R. Japan	Hello from Tokyo (listener letters, music and short features)
	R. New Zealand Int.	Mediawatch (examining and analyzing recent performance and trends in NZ's news media)
1115	WWCR(9475kHz)	Ask WWCR
1130	R. Australia	The Business Report (a weekly round-up of the latest business news and information from Australia and the world presented by Narelle Hooper)
	BBCWS(am)	Arts in Action (a weekly report on trends and developments in the fine arts around the world)
1135	R. New Zealand Int.	Sunday Supplement (the views of ordinary New Zealanders)
1140	R. Korea Int.	Multivoice Feedback (RRI's interactive program for DXers and SWLs)

Monday-Friday		
1100	R. New Zealand Int.	Late Edition (RNZ National Radio's late evening news magazine)
1105	BBCWS(am)	Caribbean Report (the latest news in the Caribbean)
	R. Australia	Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
1110	BBCWS(am)	Caribbean Sport
1115	BBCWS(am)	Caribbean Magazine (a current affairs and feature program focusing on life in the region)
	R. Japan	Asian Top News (the day's major stories as reported by the region's radio stations)
1130	BBCWS(am)	World Business Report (a guide through the main business issues of the day)
	HCB Ecuador	Morning in the Mountains (the longstanding breakfast program from The Voice of the Andes with news, sports, prayer, friendly conversation and inspirational music)
	R. Australia	RA Sport (a daily report on sports events in Australia, Asia and the world)
	R. Netherlands	Newsline (news, analysis and background reports)
Monday		
1125	R. Japan	Unforgettable Musical Masterpieces (a focus on Japanese pop songs written in the past war years as a means of explaining Japanese history and attitudes)
1130	BBCWS(am)	Letter from America (commentary on America by Alistair Cooke)
1135	R. Netherlands	Wide Angle (a weekly in-depth look at a news topic)
1145	BBCWS(am)	Sports Round-up (all the daily sporting news worldwide)
1155	R. Netherlands	The Week Ahead (on RN the next seven days)
Tuesday		
1125	R. Japan	Let's Learn Japanese (a Japanese language lesson for beginners)
1130	BBCWS(am)	Analysis (background to stories in the news)
1145	R. Korea Int.	Cultural Promenade (reports on contemporary and traditional Korean arts and culture)
1145	BBCWS(am)	Sports Round-up (all the daily sporting news worldwide)
Wednesday		
1125	R. Japan	Japan Music Log (songs rooted in the lifestyles of each region of Japan, introducing the local traditions, history and culture)
1130	BBCWS(am)	Analysis (background to stories in the news)
1145	BBCWS(am)	Sports Round-up (all the daily sporting news worldwide)
	R. Korea Int.	Economic Radar (reports on Korean businesses and the Korean and Asian economies)
Thursday		
1125	R. Japan	Brush Up Your Japanese (an intermediate course in Japanese)
1130	BBCWS(am)	From Our Own Correspondent (background to the news from BBC correspondents around the world)
1145	BBCWS(am)	Sports Round-up (all the daily sporting news worldwide)
	R. Korea Int.	Korea and Its Splendors (a visit to a major historical, cultural or tourist attraction in Korea)
Friday		
1125	R. Japan	Music Beat (contemporary Japanese popular music)
1130	BBCWS(am)	Analysis (background to stories in the news)
1145	R. Korea Int.	Notes of Nostalgia (traditional Korean music)
1145	BBCWS(am)	Football Extra (global soccer news, reviews and interviews)
1100	WWCR(5070kHz.)	The Old Record Shop (vintage recordings)
1105	R. Australia	Correspondents Report
1110	R. Japan	Pop! Goes Asia (a look at Asia as it is now, presenting the cultures and lifestyles of other Asian countries through their popular music)
	R. New Zealand Int.	Deep Purple (relaxing music)
1130	BBCWS(am)	World Business Review (Martin Webber explains the consequences of recent business developments for companies, investors and consumers)
	R. Australia	Fine Music Australia (Australian classical artists with Charles Southwood)
1135	R. Netherlands	Europe Unzippod (the events of the past week in Europe, some unusual)
1140	R. Korea Int.	From Us to You (RRI answers listener mail and rewards its contest winners)
1145	BBCWS(am)	Sports Round-up (all the daily sporting news worldwide)
1155	R. Netherlands	Insight (Rob Green casts a critical and humorous eye on the past week's headlines)

1200 UTC - Page 48 Freqs

Daily		
1200	BBCWS(am)	NewsHour (an hour of news and analysis from around the globe)
Sunday		
1200	R. Netherlands	The Sound Fountain (interesting topics approached in an unusual way using sound montage, esoteric conversations, inner musings and atmospheric music)
1205	R. Australia	Country Club (Richard Porteous with an off-the-road ramble through the various tracks that make up that very wide field of country music)
1230	R. Netherlands	Dutch Horizons (Beritine Kral chronicles life in Holland)
	R. Sweden	In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nido Hagstrom)

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1300 UTC - Page 49 Freqs

WRMI(15725kHz.)
Monday-Friday
 200 HCB Ecuador Latin American and International News
 1205 BBCWS(am) Caribbean Business (a report on regional commerce and economics)
 HCB Ecuador Sports Report
 1210 BBCWS(am) Caribbean Report (the latest news in the Caribbean)
 HCB Ecuador Morning in the Mountains (continues from 1130)
 1230 HCB Ecuador Latin American and International News
 R. Sweden Sixty Degrees North (reports, interviews and analysis on the Nordic region)
 Morning in the Mountains (continues from 1130)
Monday
 1200 R. Netherlands EuroQuest (a magazine placing Europe in context)
 1205 R. Australia Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)
 230 R. Netherlands The Research File (a magazine emphasizing the relevance of science to all our lives)
 245 R. Sweden Sports Scan (a weekly report on sports in the Nordic region)
Tuesday
 1200 R. Netherlands A Good Life (how development affects societies)
 WWCR(15685kHz.) World of Radio (Glenn Houser's comprehensive review of the week in shortwave and international broadcasting)
 1205 R. Australia Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)
 1230 R. Netherlands Music 52-15 (Martha Howley presents musical styles from around the globe)
 1245 R. Sweden Close Up (profiles of people in Sweden from all walks of life)
Wednesday
 1200 R. Netherlands Dutch Horizons (Bertine Krol chronicles life in Holland)
 WWCR(15685kHz.) Communications World (Kim Elliott reviews the week in global communications)
 1205 R. Australia Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)
 1230 R. Netherlands The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)
 1245 R. Sweden Money Matters (a weekly economic report on the Nordic region)
Thursday
 1200 R. Netherlands The Research File (a magazine emphasizing the relevance of science to all our lives)
 1205 R. Australia Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)
 1230 R. Netherlands The Sound Fountain (interesting topics approached in an unusual way using sound montage, esoteric conversations, inner musings and atmospheric music)
 1245 R. Sweden Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)
 Greenscan (Azariah Kiros highlights Swedish environmental awareness and challenges the second week of the month)
 Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)
 The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)
Friday
 1200 R. Netherlands The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)
 1205 R. Australia Sound Quality (Tim Ritchie seeks out the interesting, the evolutionary, the inaccessible and the wonderful in music)
 1230 R. Netherlands A Good Life (how development affects societies)
 1245 R. Sweden A Report on the Nordic Newsweek (the week's main news stories)
Saturday
 1200 R. Netherlands Roughly Speaking (European youth lifestyles magazine)
 1205 R. Australia The Spirit of Things (Dr. Rachael Kahn explores contemporary values and beliefs as expressed through ritual, art, music, and sacred texts)
 WWCR(5070kHz.) This Week in Americana (magazine about antique collecting)
 1215 WWCR(15685kHz.) Eco Watch (global ecological developments)
 1230 R. Netherlands Music 52-15 (Martha Howley presents musical styles from around the globe)
 R. Sweden Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)
 Sweden Today (George Wood presents the voices of Sweden, the second week of the month)
 Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)
 Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)

Sunday

1300 Channel Africa
 1305 BBCWS(am)
 R. Australia
 R. Netherlands
 1320 China R. Int.
 1330 BBCWS(am)
 R. Sweden

Channel Africa Extra (a weekend magazine and variety show with news, sports, music, regular reports and features)
 Jazzmatazz (weekly jazz magazine)
 Country Club (continues from 1205)
 Sincerely Yours (Howard Shannon and Neville Powis host RN's listener response program)
 In the Spotlight (Chinese arts and cultural magazine)
 In Praise of God (diverse services of worship)
 In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström)
 Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first)
 Capital Cafe (conversations with Finns from all walks of life)

1330 YLE R. Finland

Monday-Friday

1300 KWHR(11565kHz.)
 R. Australia
 R. Netherlands
 1305 BBCWS(am)
 1310 R. Canada Int.

DXing with Cumbre (Marie Lamb with the hottest DX catches)
 RA News (a fifteen minute report with emphasis on significant events in Asia and the Pacific region; with sports)
 Newswire (news, analysis and background reports)
 Outlook (topical magazine of people, places and events)
 This Morning (Shelagh Rogers hosts a lively mix of interviews, documentaries, music, and personal essays debating and discussing issues important to Canadians and showcasing Canada's finest writers, musicians, and artists)
 The Planet (Lucky Oceans, a/k/a Reuben Goshold, presents good, heartfelt, inspiring music from around the world with a rich mix of jazz, blues, folk styles, art music and more in a show artfully arranged for radio)
 Current Affairs (reports and comment on events and issues)
 Sixty Degrees North (reports, interviews and analysis on the Nordic region)
 Finland This Morning (a breakfast program with news, a business report, sports, weather and interviews focused on Finland and the Nordic region)
 Off the Shelf (abridged serialized readings of novels, stories and other literature)

Monday

1330 China R. Int.
 1345 R. Sweden
 WWCR(15685kHz.)

People in the Know (interviews with prominent Chinese who are shaping the nation's future)
 Sports Scan (a weekly report on sports in the Nordic region)
 Eco Watch (global ecological developments)

Tuesday

1330 China R. Int.
 1345 R. Sweden
Wednesday
 1345 R. Sweden

Sports World (the sports scene in China and Asia)
 Close Up (profiles of people in Sweden from all walks of life)

Thursday

1330 WWCR(15685kHz.)
 1345 R. Sweden

Money Matters (a weekly economic report on the Nordic region)
 Communications World (Kim Elliott reviews the week in global communications)

Friday

1330 China R. Int.
 1345 R. Sweden

Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)
 Greenscan (Azariah Kiros highlights Swedish environmental awareness and challenges the second week of the month)
 Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)
 The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)

Saturday

1300 Channel Africa
 WHRI(6040kHz.)
 1305 BBCWS(am)
 R. Australia
 WWCR(5070kHz.)
 1320 China R. Int.
 1330 R. Sweden

Channel Africa Extra (a weekend magazine and variety show with news, sports, music, regular reports and features)
 DXing with Cumbre (Marie Lamb with the hottest DX catches)
 World Football (interviews, features, reports for soccer fans around the globe)
 The Science Show (one of the longest running programs on ABC Radio)
 Rock the Universe (Christian rock music)
 Listeners' Garden (letters, touring, cooking and a language lesson)
 Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)
 Sweden Today (George Wood presents the voices of Sweden, the second week of the month)
 Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)
 Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)
 DXing with Cumbre (Marie Lamb with the hottest DX catches)

YLE R. Finland

Finland This Week (the best reports and interviews from the weekday program, Finland This Morning)
 Starting Finnish (a language lesson)

1345 YLE R. Finland

1400 UTC - Page 49 Freqs

Daily

1400 R. Japan

News (a round-up of Asian and world news)

Sunday

1400 Channel Africa
 WRMI(15725kHz.)
 1405 BBCWS(am)

Channel Africa Extra (continued from 1300)
 World Radio Network (a relay of WRN's satellite service)
 Talking Point (global phone-in where listeners and internet users can share their views on the issues of the day and put questions to expert guests)

R. Australia

Books and Writing (Ramona Koval conducts in-depth discussions focusing on books, ideas and writing)
 The Sunday Edition (the more relaxed and reflective weekend edition of This Morning, hosted by Michael Enright)

1410 R. Canada Int.

Roundup Asia (interviews and reports highlighting various aspects of the rapidly changing Asian region)

1420 China R. Int.

In the Spotlight (Chinese arts and cultural magazine)
 In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström)

1430 R. Sweden

Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first)
 Sincerely Yours (Howard Shannon and Neville Powis host RN's listener response program)

1435 R. Netherlands

The Week Ahead (an RN the next seven days)

1455 R. Netherlands

Monday-Friday

1405 R. Australia

The Planet (continues from 1315)
 This Morning (continues from 1310)

1415 China R. Int.

Current Affairs (reports and comment on events and issues)
 44 Minutes (current affairs magazine about Japan and Asia)
 Newswire (news, analysis and background reports)
 Sixty Degrees North (reports, interviews and analysis on the Nordic region)

1430 R. Netherlands

Meridian-Masterpiece (critical examinations of creative endeavors)

1445 R. Sweden

The Music Mix (insights into current popular music)
 People in the Know (interviews with prominent Chinese who are shaping the nation's future)
 Sports Scan (a weekly report on sports in the Nordic region)

Tuesday

1405 BBCWS(am)

Meridian-Screen (interviews, documentaries, features and discussions on the film arts)
 The UK Top Twenty (music from the British rock and pop charts)

1430 BBCWS(am)

Sports World (the sports scene in China and Asia)
 Close Up (profiles of people in Sweden from all walks of life)

China R. Int.

Money Matters (a weekly economic report on the Nordic region)
 Communications World (Kim Elliott reviews the week in global communications)

1445 R. Sweden

Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)
 Greenscan (Azariah Kiros highlights Swedish environmental awareness and challenges the second week of the month)
 Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)
 The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)

Wednesday

1405 BBCWS(am)

Meridian-Music (an in-depth look at classical music of the world)
 Westway (a radio soap opera)

1430 BBCWS(am)

The UK Album Chart (music from Britain's most popular CDs)
 Money Matters (a weekly economic report on the Nordic region)

China R. Int.

Meridian-Writing (reports on books, theatre, poetry, journalism, biography, history and anthropology)
 World of Music (the best of folk, non-Western classical and non-Western popular music)

1445 R. Sweden

Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)
 Greenscan (Azariah Kiros highlights Swedish environmental awareness and challenges the second week of the month)
 Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)
 The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)

Thursday

1405 BBCWS(am)

Omnibus (a weekly feature documentary program that tackles any topic across the globe)
 Westway (a radio soap opera)

1430 BBCWS(am)

Life in China (a weekly magazine focusing on the lives of ordinary people in China)
 Revolver (each week a different presenter reviews some recent releases that have caught their ear, from metal to country, from indie to rhythm and blues)

China R. Int.

A Report on the Nordic Newsweek (the week's main news stories)

1445 R. Sweden

Channel Africa Extra (continued from 1300)
 Sportsworld (live commentary on major sports events and features, reports and results from around Britain and Europe, and news of all the day's sporting action from around the world)

Friday

1405 BBCWS(am)

Channel Africa Extra (continued from 1300)
 Sportsworld (live commentary on major sports events and features, reports and results from around Britain and Europe, and news of all the day's sporting action from around the world)

1430 BBCWS(am)

Channel Africa Extra (continued from 1300)
 Sportsworld (live commentary on major sports events and features, reports and results from around Britain and Europe, and news of all the day's sporting action from around the world)

China R. Int.

Channel Africa Extra (continued from 1300)
 Sportsworld (live commentary on major sports events and features, reports and results from around Britain and Europe, and news of all the day's sporting action from around the world)

1445 R. Sweden

Channel Africa Extra (continued from 1300)
 Sportsworld (live commentary on major sports events and features, reports and results from around Britain and Europe, and news of all the day's sporting action from around the world)

Saturday

1400 Channel Africa

Channel Africa Extra (continued from 1300)
 Sportsworld (live commentary on major sports events and features, reports and results from around Britain and Europe, and news of all the day's sporting action from around the world)

1405 BBCWS(am)

Channel Africa Extra (continued from 1300)
 Sportsworld (live commentary on major sports events and features, reports and results from around Britain and Europe, and news of all the day's sporting action from around the world)

Shortwave Guide



R. Australia New Dimensions (intimate conversations with many of this century's leading thinkers and social innovators)
 R. Prague Readings from Czech Literature
 1410 R. Canada Int. The House (Jason Moscovitz presents a review of the week in Canadian national politics)
 R. Japan Weekend Square (a program designed to present various aspects of Japan in a friendly and relaxed atmosphere with interviews, music and discussions)
 R. Prague Saturday Music (Czech classical, folk, jazz or rock music)
 1415 WWCR(15685kHz.) Ask WWCR
 1420 China R. Int. Listeners' Garden (letters, touring, cooking and a language lesson)
 1430 R. Sweden Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)
 Sweden Today (George Wood presents the voices of Sweden, the second week of the month)
 Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)
 Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)
 1435 R. Netherlands Europe Unzipped (the events of the past week in Europe, some unusual)
 1455 R. Netherlands Insight (Rob Green casts a critical and humorous eye on the past week's headlines)

R. Netherlands The Research File (a magazine emphasizing the relevance of science to all our lives)
 1545 R. Canada Int. Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)
 Friday
 1500 R. Netherlands A Good Life (how development affects societies)
 1505 BBCWS(am) Sports International (the issues and personalities behind the headlines)
 1530 BBCWS(am) Pick of the World (Daire Brahan presents World Service highlights and talks with the producers and presenters of BBC programs)
 The Sports Factor (Amanda Smith presents reports which debate and celebrate the cultural significance of sport)
 R. Canada Int. C'est La Vie (Bernard St.-Laurent presents a program about life in Quebec and French-speaking Canada)
 R. Netherlands The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)
 Saturday
 1500 R. Netherlands Music 52-15 (Martha Howley presents musical styles from around the globe)
 1505 BBCWS(am) Sportsworld (continues from 1405)
 R. Australia Melisma (Mairi Nicolson weaves together chamber music, folk sources and jazz innovations in a graceful, melodic and sometimes challenging two hours)
 R. Canada Int. The Vinyl Cafe (Canadian humorist and storyteller Stuart McLean plays music he's found at a mythical record store and weaves tales centered around the store's neighborhood)
 Roughly Speaking (European youth lifestyles magazine)
 1530 R. Netherlands

1710 R. Japan Hello from Tokyo (listener letters, music and short features)
 1730 VOA Africa Music Time in Africa (Rita Rochelle highlights the best of traditional and modern African music) [broadcast in two editions with part two airing at 1930]
 Monday-Friday
 1700 WWCR(15685kHz.) World Wide Country Radio (country music)
 1705 R. Australia Bush Telegraph (Helen Brown hosts an entertaining look at rural and regional issues around Australia)
 VOA News Now Talk to America (Carol Pearson hosts a worldwide call-in show featuring American decisionmakers, personalities and experts)
 Monday
 1710 R. Japan Pop! Goes Asia (a look at Asia as it is now, presenting the cultures and lifestyles of other Asian countries through their popular music)
 Tuesday-Saturday
 1715 R. Japan 44 Minutes (current affairs magazine about Japan and Asia)
 Saturday
 1705 R. Australia New Dimensions (an internationally syndicated program featuring interviews with leading thinkers and social innovators)
 VOA Africa Hip Hop Connections (Rod Murray with the latest US hip hop music, interviews with artists and information of interest to African youth)
 1745 WWCR(15685kHz.) New Horizons (2001 NY International Radio Award winning program reporting on breakthrough discoveries in science, medicine and technology)

1500 UTC - Page 50 Freqs

Sunday
 1500 R. Netherlands Dutch Horizons (Bertine Krol chronicles life in Holland)
 WRMI(15725kHz.) Wavescan (Adventist World Radio's SWL program)
 1505 BBCWS(am) Assignment (delving behind the headlines)
 R. Australia Encounter (a highly acclaimed series exploring the connections between religion and life while reflecting on the religious experience of multicultural Australia)
 1505 R. Canada Int. The Sunday Edition (continues from 1410, usually with a feature documentary)
 1530 BBCWS(am) People and Politics (inside British politics)
 R. Netherlands The Sound Fountain (interesting topics approached in an unusual way using sound montage, esoteric conversations, inner musings and atmospheric music)
Monday-Friday
 1505 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
 1505 R. Canada Int. This Morning (continues from 1310)
Monday
 1500 R. Netherlands The Research File (a magazine emphasizing the relevance of science to all our lives)
 1505 BBCWS(am) One Planet (stories about the environment, development, agriculture and human impact on the natural world)
 1530 BBCWS(am) People and Places (a forum for the exchange of views and experiences on a global scale)
 R. Australia The Health Report (Dr. Norman Swan's weekly report on health and medical issues)
 R. Netherlands EuroQuest (a magazine placing Europe in context)
 1545 R. Canada Int. Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)
Tuesday
 1500 R. Netherlands Music 52-15 (Martha Howley presents musical styles from around the globe)
 1505 BBCWS(am) Discovery (in-depth exploration of ideas and discoveries in science and technology)
 1530 BBCWS(am) Essential Guide (the biggest developments, issues and names in global affairs)
 R. Australia The Law Report (Damien Carrick presents breaking legal stories in Australia and overseas.)
 R. Netherlands A Good Life (how development affects societies)
 1545 R. Canada Int. Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)
Wednesday
 1500 R. Netherlands The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)
 1505 BBCWS(am) Health Matters (reports on research explaining where medicine is going)
 1530 R. Australia The Religion Report (Lyn Gallocher examines the way religion and societies interact)
 1530 BBCWS(am) Everywoman (the BBC's international magazine for women)
 R. Netherlands Dutch Horizons (Bertine Krol chronicles life in Holland)
 1545 R. Canada Int. Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)
Thursday
 1500 R. Netherlands The Sound Fountain (interesting topics approached in an unusual way using sound montage, esoteric conversations, inner musings and atmospheric music)
 1505 BBCWS(am) Go Digital (technology journalist Tracey Logan explains the latest in IT)
 1530 BBCWS(am) Focus on Faith (Trevor Barnes looks at the religious stories behind the news)
 R. Australia The Media Report (Mick O'Regan takes a critical look at the latest developments in the communications industry)

1600 UTC - Page 50 Freqs

Daily
 1630 R. Austria Int. Report from Austria (a daily magazine focusing on Austria and central and eastern Europe)
Sunday
 1600 WHRI(15105 kHz.) DXing with Cumbre (Marie Lamb with the hottest DX catches)
 1601 BBCWS(am) Concert Hall (classical music recitals and performances)
 1605 R. Australia The National Interest (Terry Lane's round-up of the week's major issues)
 R. Canada Int. The Sunday Edition (continues from 1410)
 R. Netherlands Wide Angle (a weekly in-depth look at a news topic)
 1635 R. Austria Int. Radio E (a weekly magazine on Europe jointly produced by the BBC and other European broadcasters)
Monday-Friday
 1600 BBCWS(am) World Briefing
 R. Netherlands Newswire (news, analysis and background reports)
 1645 BBCWS(am) Sports Roundup (all the daily sporting news worldwide)
Monday
 1630 BBCWS(am) Analysis (background to stories in the news)
Tuesday
 1605 R. Australia The Comfort Zone (Alan Saunders presents a unique program that debates and celebrates the cultural significance of architecture and design, landscape and gardens, and food)
 1630 BBCWS(am) Analysis (background to stories in the news)
Wednesday
 1605 R. Australia Verbatim (a program that charts the story of the 20th century through the voices of ordinary Australians)
 1630 R. Australia Earshot (a half-hour feature from the footpaths, paddocks, lounge rooms and shopping malls of the diverse Australian continent)
 1630 BBCWS(am) From Our Own Correspondent (the background to the news from BBC correspondents around the world)
Thursday
 1605 R. Australia Hindsight (a documentary program that looks at Australian social history through the broad themes of institutions, popular culture, health and the environment)
 1630 BBCWS(am) Analysis (background to stories in the news)
Friday
 1605 R. Australia Away! (Produced and presented by Aboriginal broadcasters, this is Australia's only national indigenous arts and culture program)
 1630 BBCWS(am) Analysis (background to stories in the news)
Saturday
 1600 BBCWS(am) News
 WHRI(13760 kHz.) DXing with Cumbre (Marie Lamb with the hottest DX catches)
 1605 BBCWS(am) Sportsworld (continues from 1405)
 R. Australia Melisma (continues from 1505)
 R. Canada Int. Quirks and Quarts (what's new and next in science)
 R. Netherlands Europe Unzipped (the events of the past week in Europe, some unusual)
 1700 UTC - Page 51 Freqs
Daily
 1700 R. Japan News (a round-up of Asian and world news)
Sunday
 1705 R. Australia The Spirit of Things (Dr. Rachael Kahn explores contemporary values and beliefs as expressed through ritual, art, music, and sacred texts)

2100 UTC - Page 53 Freqs

Daily
 2100 R. Japan News (a round-up of Asian and world news)
Sunday
 2100 BBCWS(am) Newshour (an hour of news and analysis from around the globe)
 WBCQ(7415kHz.) Radio Caroline ("Europe's first and only album station")
 WRMI(15725kHz.) Viva Miami (R. Miami International's listener magazine program)
 2110 R. Australia AM (ABC Radio's flagship morning news magazine)
 R. Canada Int. The Maple Leaf Mailbag (Ian Jones reads listener letters and answers their questions) [The CIX Report is included fortnightly]
 R. Japan Weekend Square (a program designed to present various aspects of Japan in a friendly and relaxed atmosphere with interviews, music and discussions)
 2130 R. Australia Educational series (a series of documentary programs dealing with Asian or Pacific history, politics or communications. Specific details were unavailable at deadline)
 2135 R. Canada Int. Spotlight (a magazine touching on all facets of artistic and cultural life in Canada)
 2245 BBCWS(am) Reporting Religion (the week's religion news)
Monday-Friday
 2100 R. Canada Int. Canada Today (daily magazine of interviews, correspondents' reports and Canadian views on world and national events)
Monday
 2105 BBCWS(am) Discovery (in-depth exploration of ideas and discoveries in science and technology)
 2110 R. Japan Pop! Goes Asia (a look at Asia as it is now, presenting the cultures and lifestyles of other Asian countries through their popular music)
 2110 R. Australia AM (ABC Radio's flagship morning news magazine)
 2130 R. Australia The Health Report (Dr. Norman Swan's weekly report on health and medical issues)
 2135 R. Canada Int. Media Zone (Ian Jones hosts a weekly forum with Canadian journalists discussing topical issues facing Canadians)
Tuesday-Saturday
 2115 R. Japan Asian Top News (the day's major stories as reported by the region's radio stations)
Tuesday
 2105 BBCWS(am) Health Matters (reports on research explaining where medicine is going)
 2110 R. Australia AM (ABC Radio's flagship morning news magazine)
 2125 R. Japan Unforgettable Musical Masterpieces (a focus on Japanese pop songs written in the past war years as a means of explaining Japanese history and attitudes)
 2130 R. Australia Innovations (a program showcasing Australian invention, enterprise and ingenuity)
 2135 R. Canada Int. Spotlight (a magazine touching on all facets of artistic and cultural life in Canada)
Wednesday
 2105 BBCWS(am) Go Digital (technology journalist Tracey Logan explains the latest in IT)
 2110 R. Australia AM (ABC Radio's flagship morning news magazine)
 2125 R. Japan Let's Learn Japanese (a Japanese language lesson for beginners)
 2130 BBCWS(am) Focus on Faith (Trevor Barnes looks at the religious stories behind the news)
 R. Australia The Religion Report (Lyn Gallocher examines the way reli-

Shortwave Guide



2135 R. Canada Int.	gion and societies interact) The Maple Leaf Mailbag (Ian Jones reads listener letters and answers their questions)[The CIDX Report is included fortnightly]
Thursday	
2100 WBCQ(7415kHz.) WWCR(12160kHz.)	Radio Caroline ("Europe's first and only album station") Keen on Jazz
2105 BBCWS(am)	Sports International (the issues and personalities behind the headlines)
2110 R. Australia	AM (ABC Radio's flagship morning news magazine)
2115 WWCR(15685kHz.)	Eco Watch (global ecological developments)
2125 R. Japan	Japan Music Log (songs rooted in the lifestyles of each region of Japan, introducing the local traditions, history and culture)
2130 BBCWS(am)	Pick of the World (Daire Brehan presents World Service highlights and talks with the producers and presenters of BBC programs)
R. Australia	Rural Reporter (ABC's rural reporters present news and stories from rural and regional Australia)
WWCR(15685kHz.)	World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)
2135 R. Canada Int.	Business Sense (an in-depth look at Canadian companies in the global economy)
Friday	
2100 WBCQ(7415kHz.) WWCR(15685kHz.)	Radio Caroline ("Europe's first and only album station") Ask WWCR
2105 BBCWS(am)	One Planet (stories about the environment, development, agriculture and human impact on the natural world)
R. Australia	Feedback (Roger Broadbent answers listener questions and provides regular updates about RA)
2115 WWCR(15685kHz.)	New Horizons (2001 NY International Radio Award winning program reporting on breakthrough discoveries in science, medicine and technology)
2125 R. Japan	Brush Up Your Japanese (an intermediate course in Japanese)
2130 BBCWS(am)	People and Places (a forum for the exchange of views and experiences on a global scale)
R. Australia	Oz Sounds (Australian new music releases)
2135 R. Canada Int.	Canada in the World (Wojtek Gwiazda hosts a weekly magazine examining Canadian policies, priorities and international relations)
Saturday	
2100 BBCWS(am)	Newshour (an hour of news and analysis from around the globe)
WBCQ(7415kHz.) WRM(15725kHz.)	Radio Caroline ("Europe's first and only album station") Viva Miami (R. Miami International's listener magazine show)
2105 R. Australia	Australia All Over (Ian McManama - aka "Macco" - hosts this celebration of Australian and traditional Australian customs and values)[begins at 1900]
2105 R. Prague	Readings from Czech Literature
2110 R. Canada Int.	Business Sense (an in-depth look at Canadian companies in the global economy)
R. Prague	Saturday Music (Czech classical, folk, jazz or rock music)
2125 R. Japan	Music Beat (contemporary Japanese popular music)
2130 WWCR(15685kHz.)	Presidential Radio Address and the Democratic Party Response
2135 R. Canada Int.	Canada in the World (Wojtek Gwiazda hosts a weekly magazine examining Canadian policies, priorities and international relations)
2145 R. Australia	Asia Sunday (a weekly report on regional events and issues)
WWCR(12160kHz.)	Ask WWCR

2200 UTC - Page 54 Freqs

Sunday	
2200 BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news program)
WBCQ(7415kHz.)	Communications World (Kim Elliott reviews the week in global communications)
2210 R. Australia	AM (ABC Radio's flagship morning news magazine)
2230 BBCWS (am)	Agenda (ideas and trends shaping our world)
2230 R. Vlaanderen Int.	Radio World (Frans Vossen presents a weekly report about international radio)
2240 R. Australia	The Australian Music Show (the latest rock music from the Triple J youth network of the ABC)
Monday-Friday	
2200 WWCR(12160kHz.)	World Wide Country Radio (country music)
2205 BBCWS(am)	World Business Report
2230 BBCWS(am)	Sports Roundup (all the daily sporting news worldwide)
Monday	
2200 WBCQ(7415kHz.)	Jean Shepherd (the noted humorist's classic radio programs from the 60s and 70s)
2210 R. Australia	AM (ABC Radio's flagship morning news magazine)
2240 R. Australia	Music Deli (Austrian performances of folk, acoustic, traditional and world music)
2245 BBCWS(am)	Analysis (background to stories in the news)
WBCQ(7415kHz.)	Seldom Heard Radio (eclectic musical selections)
Tuesday	
2210 R. Australia	AM (ABC Radio's flagship morning news magazine)

2240 R. Australia	Blacktracker (Mal Holness presents contemporary Aboriginal music)
2245 BBCWS(am)	Analysis (background to stories in the news)
Wednesday	
2200 WBCQ(7415kHz.)	Uncle Ed's Musical Memories
2210 R. Australia	AM (ABC Radio's flagship morning news magazine)
2240 R. Australia	Oz Country Style (country music from Australia)
2245 BBCWS(am)	From Our Own Correspondent (the background to the news from BBC correspondents around the world)
Thursday	
2210 R. Australia	AM (ABC Radio's flagship morning news magazine)
2240 R. Australia	Jazz Notes (Australian jazz presented by Ivan Lloyd)
2245 BBCWS(am)	Analysis (background to stories in the news)
Friday	
2200 WBCQ(7415kHz.) WHRA(17650kHz.)	Juliet's Wild Kingdom
2205 R. Australia	DXing with Cumbre (Marie Lamb with the hottest DX catches)
R. Australia	Asia-Pacific Weekend Edition (regional news and business report)
2230 WBCQ(7415kHz.)	Pab Sungenis Project (stand-up comedy and sketches)
2245 BBCWS(am)	Analysis (background to stories in the news)
Saturday	
2200 BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news program)
WBCQ(7415kHz.)	HarvZower (a personal selection of contemporary music)
2205 R. Australia	Correspondents Report (The ABC's overseas reporters give their interpretation and analysis of the week's major events.)
2230 BBCWS(am)	From Our Own Correspondent (background to the news from BBC correspondents around the world)
R. Australia	The Business Report (a weekly round-up of the latest business news and information from Australia and the world presented by Marelle Hooper)
R. Vlaanderen Int.	Music from Flanders (a half-hour of Flemish music, musicians and musical performances)
WHRA(17650kHz.)	DXing with Cumbre (Marie Lamb with the hottest DX catches)
2235 R. Prague	Readings from Czech Literature
2240 R. Prague	Saturday Music (Czech classical, folk, jazz or rock music)

2300 UTC - Page 54 Freqs

Daily	
2300 BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news program)
Sunday-Thursday	
2300 R. New Zealand Int.	Midday Report (news updates and in-depth reports)
Sunday	
2300 R. Canada Int.	The World This Weekend (CBC weekend news magazine)
2310 R. Australia	Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
2320 China R. Int	In the Spotlight (Chinese arts and cultural magazine)
2330 BBCWS(am)	The Greenfield Collection (Edward Greenfield plays classical music requests and selections drawn from his own collection)
R. Australia	Earthbeat (Alexandra DeBlas presents a program on environmental science)
R. Canada Int.	The Inside Track (anthologies and documentaries about sports and those who compete in them)
2335 R. Netherlands	Sincerely Yours (Howard Shannon and Neville Powis host RN's listener response program)
2355 R. Netherlands	The Week Ahead (on RN the next seven days)
Monday-Friday	
2300 R. Canada Int.	The World at Six (the CBC's flagship evening newscast)
WBCQ(7415kHz.)	Wanton Display of Control and Disruption (satire)[1st Mon.]
	A Few of My Favorite Things [2nd Mon.]
	Seldom Heard Radio (eclectic musical selections)[3rd/5th Mon.]
2310 R. Bulgaria	Events and Developments (reports, analysis and commentary on Bulgarian and Balkan events)
2330 R. Netherlands	Newsline (news, analysis and background reports)
R. Canada Int.	As It Happens (Barbara Budd and Mary Lou Finley interview newsmakers from the famous to ordinary people eyewitnessing news in the making)
Monday	
2310 R. Australia	Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
2330 China R. Int.	People in the Know (interviews with prominent Chinese who are shaping the nation's future)
R. Australia	The Buzz (the week's big technology news and issues presented by Richard Aedy)
Tuesday	
2310 R. Australia	Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
2330 China R. Int.	Sports World (the sports scene in China and Asia)
R. Australia	Arts Talk (Julie Copeland presents the world of arts and cultural ideas)
Wednesday	
2300 WBCQ(7415kHz.)	The Planet (from Complex Variables Studio)
2310 R. Australia	Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
2330 R. Australia	Rural Reporter (ABC's rural reporters present news and stories from rural and regional Australia)

Thursday	
2310 R. Australia	Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
2330 R. Australia	The Media Report (Mick O'Ragan takes a critical look at the latest developments in the communications industry)
Friday	
2305 R. Australia	Lingua Franca (a program about language and its social, cultural and historical ramifications)
2310 R. New Zealand Int.	Focus on Politics (a report on government and politics in NZ)
2315 WWCR(15685kHz.)	World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)
2330 BBCWS(am)	Global Business (Peter Day charts the transformations sweeping through the world of work and commerce)
China F. Int.	Life in China (a weekly magazine focusing on the lives of ordinary people in China)
R. Australia	The Sports Factor (Amanda Smith presents reports which debate and celebrate the cultural significance of sport)
R. New Zealand Int.	The Sampler (Nick Bollinger casts a critical ear over the latest CD offerings)
WBCQ(7415kHz.)	International World Beat Music
Saturday	
2300 R. Canada Int.	The World This Weekend (CBC weekend news magazine)
WBCQ(7415kHz.) WWCR(12160kHz.)	Radio Timton Worldwide
2305 R. Australia	Keen on Jazz
2310 R. New Zealand Int.	Ockham's Razor (sharp commentaries on scientific issues)
2320 China R. Int.	The Week in Parliament (a weekly roundup of NZ political news)
2330 BBCWSam	Listeners' Garden (letters, tuning, cooking and a language lesson)
R. Australia	Arts in Action (architects, playwrights, musicians and poets explain the ideas that shape our aesthetic, musical and literary worlds)
R. Canada Int.	Innovations (a program showcasing Australian invention, enterprise and ingenuity)
R. New Zealand Int.	Modly Off in All Directions (Lorne Elliott travels across Canada to capture the country's unique senses of humor)
WHRI(1495kHz.)	Spectrum (a weekly look at the people, places and events around NZ)
2335 R. Netherlands	DXing with Cumbre (Marie Lamb with the hottest DX catches)
2335 R. Netherlands	Europe Unzipped (the events of the past week in Europe, some unusual)
2335 R. Prague	Insight (Rob Green casts a critical and humorous eye on the past week's headlines)
2340 R. Prague	Readings from Czech Literature
	Saturday Music (Czech classical, folk, jazz or rock music)

Thank You ...

Additional Contributors to This Month's Shortwave Guide:

Bob Fraser, Cohasset, MA; Frank Hillton, Charleston, SC; Hans Johnson, WY/Ulis Fleming, MD /Cumbre DX/BBCM; BBC Michael Murray, UK; Adrian Sainsbury, R. New Zealand; Daniel Sampson, Arcadia, WI; Harold Sellers, Larry Van Horn, Brasstown, NC; Sam Wright, Biloxi, MS; DX Listening Digest; DX Ontario; Hard Core DX; Radio Sweden/Media Scan; Usenet Newsgroups; World of Radio; Worldwide DX Club.

All Frequencies MHz

GE Americom GE-3 - C-Band

87 degrees West longitude

1(H)	3720	Data Transmissions/Michigan Government TV (Digital)
2(V)	3740	Data Transmissions
3(H)	3760	WSBK-TV Boston, MA (digital)
4(V)	3780	Data Transmissions
5(H)	3800	Occasional video
6(V)	3820	FOX Sports North / Comcast Sportsnet (Digital)
7(H)	3840	Data Transmissions
8(V)	3860	(none)
9(H)	3880	WPIX-TV New York City (VC2+) 6.30/6.48 American Urban Radio Network 5.41/6.80 Talk America Radio Network
10(V)	3900	Occasional video
11(H)	3920	CNN/CSI
12(V)	3940	Occasional video
13(H)	3960	Occasional video
14(V)	3980	Turner Classic Movies (VC2+)
15(H)	4000	KTLA-TV Los Angeles (VC2+)
16(V)	4020	CNNfn (VC2+)
17(H)	4040	Data Transmissions
18(V)	4060	Fox Movie Channel (VC2+) 6.80 Premiere Radio Networks Channel 1 - talk radio
19(H)	4080	Fox Sports Net 7.48 KHCB-FM Houston, TX - religious format
20(V)	4100	University Network - Dr. Gene Scott
21(H)	4120	CNN feeds (occasional)
22(V)	4140	Data Transmissions
23(H)	4160	Data Transmissions
24(V)	4180	America One

GE Americom GE-3 - Ku-Band

87 degrees West longitude

1(H)	11720	Data Transmissions
2(V)	11740	(none)
3(H)	11760	Data Transmissions
4(V)	11780	Data Transmissions
5(H)	11800	Data Transmissions
6(V)	11820	Occasional video
7(H)	11840	Data Transmissions
8(V)	11860	Kentucky Educational TV KET2 (Digital)
9(H)	11880	Occasional video
10(V)	11900	National Technology University (Digital)
11(H)	11920	Data Transmissions
12(V)	11940	Occasional video
13(H)	11960	CNN Newsource (Digital)
14(V)	11980	Occasional video
15(H)	12000	Occasional video
16(V)	12020	Occasional video
17(H)	12040	Occasional video
18(V)	12060	Occasional video
19(H)	12080	Occasional video
20(V)	12100	PBS Networks (Digital)
21(H)	12120	PBS Networks/HDTV (Digital)
22(V)	12140	Educational Services (Digital)
23(H)	12160	PBS (Digital) / Annenberg-CPB Channel (Digital)
24(V)	12180	PBS (Digital)

Loral Skynet Telstar 4 - C-Band

89 degrees West longitude

1(V)	3720	X-Cubed Network (VC2+)
2(H)	3740	Data Transmissions

3(V)	3760	(none)
4(H)	3780	Exstasy (VC2+)
5(V)	3800	True Blue (VC2+)
6(H)	3820	Occasional video
7(V)	3840	The Erotic Networks Promotional Channel
8(H)	3860	Fresh Television (VC2+)
9(V)	3880	(none)
10(H)	3900	Occasional video
11(V)	3920	Occasional video
12(H)	3940	ABC feeds (occasional)
13(V)	3960	CBS (Digital)
14(H)	3980	ABC feeds (occasional) / ABC Network - East (LEITCH)
15(V)	4000	Data Transmissions
16(H)	4020	Occasional video
17(V)	4040	Occasional video
18(H)	4060	PBS Schedule X
19(V)	4080	Occasional video
20(H)	4100	Occasional video
21(V)	4120	ABC Network - West (LEITCH)
22(H)	4140	ABC Network - East (LEITCH)
23(V)	4160	Occasional video / ABC feeds (occasional)
24(H)	4180	Occasional video

Loral Skynet Telstar 4 - Ku-Band

89 degrees West longitude

T01(V)	11730	South Carolina Educational TV (Digital)
T02(H)	11743	Data Transmissions
T03(V)	11790	Data Transmissions
T04(H)	11803	Data Transmissions
T05(V)	11850	Data Transmissions
T06(H)	11863	Georgia Public TV (Digital)
T07(V)	11910	Data Transmissions
T08(H)	11923	Data Transmissions
T09(V)	11971	ABC Newsfeeds (Analog and Digital)
T10(H)	11984	Occasional video
T11(V)	12033	Occasional video
T12(H)	12046	ABC Newsfeeds (Analog and Digital)
T13(V)	12095	The Florida Channel (Digital)
T14(H)	12108	Louisiana Public Television (Digital)

T15(V)	12157	tal)/Data Transmissions Muslim TV Ahmadiyya (Digital)/ DMX for Business (Digital)
T16(H)	12170	Occasional video

The Filipino Channel/TV-5/TV Asia (Digital)

Panamsat Galaxy 11 - C-Band

91 degrees West longitude

1(H)	3720	WB Network (Digital)
2(V)	3740	FOX Cable Networks (Digital)
3(H)	3760	BET/BET International (Digital)
4(V)	3780	FOX Cable Networks (Digital)
5(H)	3800	FOX Cable Networks (Digital)
6(V)	3820	Game Show Network (VC2+) 7.30 Cable Radio Network
7(H)	3840	The Golf Channel (VC2+)
8(V)	3860	Occasional video
9(H)	3880	Outdoor Life/Bloomberg TV/ Videorala (Digital)
10(V)	3900	Shop At Home Network
11(H)	3920	Eternal Word Television Network (Digital)
12(V)	3940	WE: Women's Entertainment (VC2+)
13(H)	3960	Ovation, NUE-TV, KRMA-TV Denver, CO (Digital)
14(V)	3980	Independent Film Channel (VC2+)
15(H)	4000	7.38 RAI SateRadio - Italian 7.78 Heritage Broadcasting
16(V)	4020	The Ward Network (Digital) 7 MBC Network (Digital)
17(H)	4040	Access Television Network (Digital)
18(V)	4060	Occasional video
19(H)	4080	FOX News Channel (VC2+) America's Collectibles Network (Digital)/TCT Ministries (Digital)
20(V)	4100	Occasional video
21(H)	4120	Occasional video
22(V)	4140	FOX Cable Networks (Digital)
23(H)	4160	FOX Cable Networks (Digital)
24(V)	4180	International Channel/CCTV-4/ ART/RAI/Power TV/TV Japan/

Panamsat Galaxy 11 - Ku-Band

91 degrees West longitude

1(H)	11720	Data Transmissions
2(V)	11740	Data Transmissions
3(H)	11760	Data Transmissions
4(V)	11780	Data Transmissions
5(H)	11800	Data Transmissions
6(V)	11820	Occasional video
7(H)	11840	Data Transmissions
8(V)	11860	Data Transmissions
9(H)	11880	Data Transmissions
10(V)	11900	Data Transmissions
11(H)	11920	Data Transmissions
12(V)	11940	Data Transmissions
13(H)	11960	Occasional video
14(V)	11980	Occasional video
15(H)	12000	Occasional video
16(V)	12020	Occasional video
17(H)	12040	Data Transmissions
18(V)	12060	Primedia (Digital)
19(H)	12080	Data Transmissions
20(V)	12100	Data Transmissions
21(H)	12120	Data Transmissions
22(V)	12140	Data Transmissions
23(H)	12160	Data Transmissions
24(V)	12180	Data Transmissions
25(H)	10964	South American beamed
26(V)	10976	South American beamed
27(H)	10994	South American beamed
28(V)	11006	South American beamed
29(H)	11024	South American beamed
30(V)	11036	South American beamed
31(H)	11054	South American beamed
32(V)	11066	South American beamed
33(H)	11084	South American beamed
34(V)	11096	South American beamed
35(H)	11114	South American beamed
36(V)	11156	South American beamed
37(H)	11144	South American beamed
38(V)	11156	South American beamed
39(H)	11174	South American beamed
40(V)	11186	South American beamed

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NOAA-16 and Fengyun Developments

The launch of America's NOAA-16 weather satellite (WXSAT) was eagerly anticipated, finally happening on September 15, 2000. Its orbit was carefully selected to pass northbound early afternoon, resulting in well-illuminated pictures wherever you are. It was designed to replace NOAA-14, the orbit of which, since launch, has precessed to the point where it passes north-bound nominally the same time as NOAA-12; that is, NOAA-14 has effectively become a late-afternoon satellite. NOAA-16 was declared the operational afternoon satellite on 20 March, but following a transponder problem, its automatic picture transmissions (APT) failed.

More problems recently struck NOAA-16. Part of routine satellite operations involves collection of a satellite's 'housekeeping data' (the routine onboard recording of voltages, currents and experimental measurements) by the appointed ground station. An analysis of the history of recent orbits is then made. The following entry was reported:

"NOAA-16 rev 5248 / F at 1300UTC on September 28: Post-pass review of event histories show that the STX3 transmitter power dropped dramatically at 1128z, from a nominal 9.09 watts, to 1.07 watts, where it has remained since. Subsequent review of ground received AGC data and HRPT imagery from the local HRPT receives system looked nominal at first, but reports from HRPT (1M to 3M dish) users around the world (North America, Europe, and Australia/New Zealand) as of this Monday morning indicate degraded reception in comparison to normal N-12/N-14 reception."

A significant reduction in the HRPT (high resolution) image transmission signal strength had been observed.

NOAA responded quickly to the new problem by scheduling a frequency change for October 9:

NOAA-16 from 1707 to 1698 MHz on 9 October at 0009 UTC.

NOAA-14 from 1698 to 1707 MHz on 9 October at 0008 UTC.

My own dish had been taken off its mount two days previously due to forecast high winds. When the winds did not materialize I reinstalled the dish in early October as these reports were developing. On October 10, I received a strong HRPT signal from NOAA-16, and one of my best pictures!

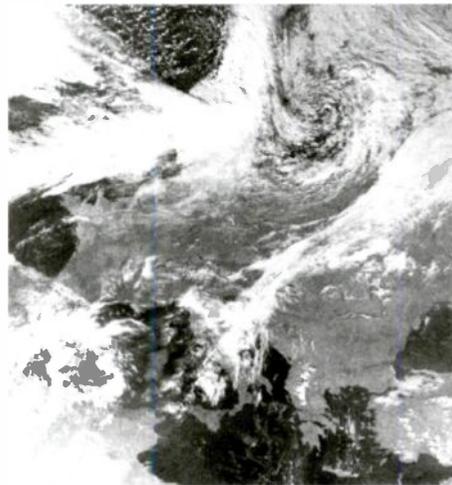


Fig 1: NOAA-16 October 10, 2001 – using the new frequency

Meanwhile, I have not observed any transmission from Resurs 01-N4 for some weeks.

◆ Fengyun – China's weather satellites

China has launched two series of WXSATs, the Fengyun-1 series of polar orbiters, and the Fengyun-2 series of geostationary satellites. Fengyun-1C was launched on May 10, 1999, and provides CHRPT (high resolution picture telemetry) on 1704.5 99 MHz – but no APT. In an orbit averaging 855km height and 98.8° inclination, it is sun-synchronous.

Data from Fengyun-1C is actively processed and distributed in China. It has produced many products for research and applications in meteorology and hydrology, climate analysis, agriculture production and environmental monitoring. CHRPT data transmission is open to all users worldwide – there is no encryption.

Unlike NOAA HRPT, the data stream includes 10 channels. These are produced by the Multi-channel Visible and IR (infrared) Scan Radiometer (MVISR) – the major sensor on FY-1C. These 10 channels include four visible channels, three near-IR channels, one short wave IR channel and two long wave IR channels. As with NOAA WXSATs, there is onboard data storage to enable the later downloading of data collected while the spacecraft is out of range of the primary ground station.

The capacity of FY-1C's storage capability was increased to 300 minutes (compared with 60 minutes for FY-1A/B). This means that besides the real time CHRPT data received within the acquisition areas of the three ground stations in Beijing, Guangzhou and Urumuqi, it is possible to receive global coverage data of four selected channels (channels 1,2,4 and 5) with reduced resolution. This data is defined as Global Delayed Picture Transmission (GDPT), and has a resolution of about 4 km along each scan line.

The fourth satellite in the first generation of Chinese polar orbiting satellites, FY-1D, was scheduled to be launched in 2001, and has similar facilities. China's second generation of polar orbiting meteorological satellites, the FY-3 series, was started some years ago. The first two satellites of the series, including on-board instruments, are currently being designed and manufactured. The FY-3 series will take a two-phase strategy to develop, with the first two satellites (FY-3A and B) defined as experimental satellites, mainly to test new instruments.

Why my sudden interest in Fengyun? I just took delivery of the module that is required to allow my HRPT system to receive and decode Fengyun CHRPT data!



Fig 2: GOES-10 visible-light image of west coast – courtesy NOAA

Frequencies

NOAA-16 suffered APT failure
NOAA-14 transmits APT on 137.62 MHz
NOAA-12 and -15 normally transmit APT on 137.50 MHz
Meteor 3-5 may transmit APT on 137.30 MHz when in sunlight
Resurs 1-4 normally transmits APT on 137.85 MHz
GOES-8 and GOES-10 use 1691 MHz for WEFAX

Emergency Alert System on HF

If you have listened to just about any AM, FM, or TV station here in the United States for any length of time you have probably heard a test of the Emergency Alert System (EAS). But just what is the EAS?

Established by the Federal Communications Commission (FCC) in November of 1994, EAS replaced the old Emergency Broadcast System (EBS) used for many years to issue public warnings. EAS provides the President with the capability to provide immediate communications and information to the general public at the national, state and local area levels during periods of national emergency.

EAS is comprised of broadcast networks; cable networks and program suppliers; AM, FM, Low Power FM (LPFM) and TV broadcast stations; and other entities and industries operating on an organized basis during emergencies.

There are two contexts in which the EAS will be used – presidentially-initiated alerts and messages and those initiated by state and local governments in concert with the broadcast industry.

For presidentially-initiated alerts and messages, there are 30 radio and television stations nationwide that are required to broadcast these transmissions to the American public for national security emergencies. The stations selected for this national system are referred to as National Primary (NP) stations.

While radio and television stations are not required to broadcast alerts and messages initiated by state and local governments, the FCC does encourage licensees to broadcast emergency alerts as a public service.

◆ The 9-11 Aftermath

One of the more interesting HF radio discoveries made after the 9-11 terrorist attack, involved the Federal Emergency Management Agency (FEMA) National Radio System (FNARS).

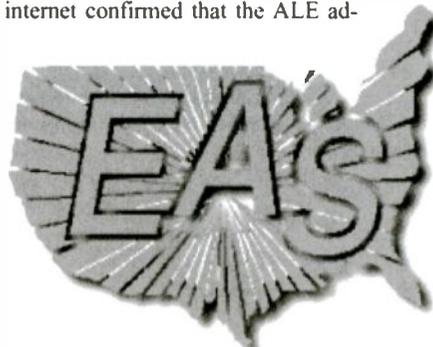
On Sunday October 6, *MT Ute World* columnist Hugh Stegman reported new and unusual Automatic Link Establishment addresses on 12216.0 kHz (a FEMA HF ALE channel). These stations were in communication with the FEMA MERS station FM4FEM in Thomasville, Georgia. Hugh's list included:

FEMEASWLS	0109
FEMEASTAM	0140
FEMEASQTM	0151
FEMEASCBS	0202
FEMEASEOC	0203
FEMEASIRO	0228

As mentioned above, the EAS national

alerting system consists of 30 radio and television stations nationwide known as National Primary (NP) stations. These stations, along with the National Weather Service (NWS) and State Emergency Operations Centers (EOC), receive and relay all National level EAS Alerts. For instance, in the Pacific Northwest the National Primary stations or Primary Entry Point AM broadcast stations are: KIRO-AM Seattle, WA; KOAC Corvallis, OR; and KBOI Boise, ID. In Texas, WBAP Fort Worth and KTRH Houston serve as National Primary stations, just to mention a few.

Some quick checks around the internet confirmed that the ALE ad-



resses Hugh monitored above were some of these National Primary/Primary Entry Point stations, as follows:

FEMEASWLS	WLS	Chicago, IL
FEMEASTAM	WTAM	Cleveland, OH
FEMEASQTM	WQTM	Orlando, FL
FEMEASCBS	WCBS	New York City, NY
FEMEASEOC	EOC	Emergency Operations Center (tentative)
FEMEASIRO	KIRO	Seattle, WA

MT contacted a broadcast engineer at one of the NP stations. He indicated that this portion of the Emergency Alert System is a tertiary network of 10 HF frequencies. NP stations in this network are using Harris 3200 HF trans-

ceivers with ALE capability running at 125 watts. These transceivers feed one of three types of antennas at the broadcast stations: dipole, end-feed, or rhombic.

While the frequency 12216 kHz is part of the FEMA's FNARS network, no known ALE activity had been reported on that frequency before. At this point we are uncertain what other FEMA frequencies make up this EAS tertiary network, but the following FNARS frequencies have had ALE activity in the past and bear watching.

2658	F05	13935	F37
3341	F06	14776	F42
5402	F13	14885	F44
6049	F16	15708	F50
6809	F21	16201	F51
7348	F22	17519	F53
9462	F24	19969	F57
10194	F25	21866	F60
10588	F27	22983	F62
13446	F36	24526	F70

If any HF ALE enthusiast intercepts more of these "FEMEAS—" type addresses in the future, we hope you'll report it to *The Fed File* column.

◆ Operation SECURE

When emergency situations arise, shortwave radio enthusiasts can sometimes monitor the situation on selected HF radio frequencies even though they aren't in the immediate affected area.

Operation SECURE (State Emergency Communications Using Radio Effectively) is a frequency allocation and assignment program that was initiated by the Federal Communications Commission (FCC), but is administered by FEMA. Operation SECURE provides each state emergency management agency the opportunity to obtain an FCC license for emergency management communications in the 2-10 MHz shortwave frequency range. Each state can license up to 10 channels for intra- and inter-state



WSM Nashville, TN, new HF antenna and Yagi which probably links EAS data received via ALE back to the studio (Doug Smith)

emergency management communications from a pool of 28 frequencies. Single sideband voice and data communications are authorized on SECURE frequencies.

Operation SECURE Frequency Pool

2326 2411 2414 2419 2422 2439 2463 2466 2471 2474
2487 2511 2535 2569 2587 2801 2804 2812 5135 5140
5167 5192 5195 7477 7480 7802 7805 7932 kHz

California Secure

The California Office of Emergency Services (OES) and CALTRANS are the largest users of this state's Operation SECURE frequencies. According to official records, some selected federal and local Emergency Operation Center (EOC) sites in remote areas also use the state's HF frequencies. Because of confusion caused by the "SECURE" name, California calls its network STACOM (State Communications). The network uses USB for communications on the following 10 frequencies: 2326 2419 2422 2812 2804 5140 5195 7480 7802 7805 kHz

California and Nevada conducted joint state-wide net every Wednesday morning at 1000 Pacific Time on 7480 kHz.

Missouri Secure

In Missouri, 25 stations are presently licensed within the state for fixed station, transportable and mobile operation on SECURE frequencies. The station call sign for the State Emergency Operations Center (EOC) is WNBE830. The system is normally tested each Wednesday morning at 0930 Central Time on 5140 kHz.

Missouri's licensed operating frequencies using the USB mode are (kHz): 2326 2411 2414 2419 2439 2463 5140 (Primary) 5192 (Interstate only) 7477 7802 (Day only) 7805 (Interstate only) 7935 (Day only)

Before we leave the Show-Me state, the Missouri National Guard is known to be a player on some of the SECURE frequencies mentioned above. In addition to SECURE, the Guard has some VHF-low band frequencies in use throughout the state.

National Guard (Office of the Adjutant General)
(MHz; primary mode is FM)

Mobiles		
46.700	F-1	Tactical
46.800	F-2	Common
49.900	F-3	Tactical
49.800	F-4	Tactical
Pocketsets		
46.800	F-1	Common
46.700	F-2	Tactical

Other Channels	
45.120	Jefferson City Units (Tone paging)
41.650	Miscellaneous Usage
41.950	Miscellaneous Usage

Washington Secure

The State of Washington SECURE system is known as CEMNET II. State agencies that use CEMNET II include the state EOC, Washington State Patrol (WSP) district communications center, other fixed/mobile sites within the

state, and adjacent states. Eight frequencies assigned under the state license KNHH 597 (fixed) and KB 44651 (mobile) are used for SECURE communications. For accountability purposes the state list these frequencies as F8 through F15. This system is primarily brought online only during critical situations, but we are told that weekly tests are conducted to ensure operational readiness.

2326 F8 (Interstate - Night) 2411 F9 (Primary Night) 2414 F10 2587 F11 2801 F12 5192 F13 7801 F14 (Interstate - Day) 7935 F15 (Primary Day)

❖ **New England Fed Monitoring**

A new reporter from the New England area passed along the following fine report of federal frequencies active in the area.

- 34.8100 Fish and Wildlife Service (USFS)
- 34.8300 Fish and Wildlife Service (USFS)
- 143.6000 Federal Emergency Management Agency (FEMA) repeater
- 163.1000 Department of Energy/All area federal agencies itinerant (Simplex)
- 163.2000 U.S. Marshal Service repeater (USMS)
- 164.5500 Federal Bureau of Investigation (FBI)
- 164.6000 U.S. Marshal Service (USMS)
- 165.2375 U.S. Customs Service (USCS)
- 165.2875 Bureau of Alcohol Tobacco and Firearms (ATF) direct/repeater
- 165.9125 Internal Revenue Service (IRS) Criminal Investigation Division direct (Simplex)
- 165.9500 Internal Revenue Service (IRS) Criminal Investigation Division repeater (F2)
- 166.4625 Treasury Department Common
- 166.5375 Bureau of Alcohol, Tobacco and Firearms (ATF) Tactical Simplex
- 166.1750 Federal Aviation Administration (FAA) maintenance repeater
- 167.0000 Internal Revenue Service (IRS) Criminal Investigation Division Direct (Simplex)
- 167.0500 Federal Communications Commission (FCC) repeater
- 167.2625 Federal Bureau of Investigation (FBI) Repeater (See listing below)
- 167.3625 Federal Bureau of Investigation (FBI)
- 167.5125 Federal Bureau of Investigation (FBI)
- 167.5375 Federal Bureau of Investigation (FBI) Special Operations (Simplex)
- 167.5625 Federal Bureau of Investigation (FBI) (See listing below)
- 167.6125 Federal Bureau of Investigation (FBI) repeater (See listing below)
- 167.8500 Northampton Veterans Administration (VA) Hospital
- 168.8625 Federal Bureau of Investigation (FBI)
- 169.4500 U.S. Customs Service common
- 170.6500 Bureau of Prisons (F-3)
- 170.8750 Bureau of Prisons (F-1)
- 170.9250 Bureau of Prisons (F-2)
- 172.9000 Federal Aviation Administration (FAA) operations repeater (F6)
- 415.0500 U.S. Postal Inspectors repeater
- 417.2000 General Services Administration Operations Security repeater
- 417.7500 Drug Enforcement Administration (DEA)
- 418.5750 Drug Enforcement Administration (DEA)
- 418.6250 Drug Enforcement Administration (DEA)
- 418.6750 Drug Enforcement Administration (DEA)
- 418.7500 Drug Enforcement Administration (DEA)
- 418.8250 Drug Enforcement Administration (DEA)
- 418.8500 Drug Enforcement Administration (DEA)
- 418.9000 Drug Enforcement Administration (DEA)
- 418.9500 Drug Enforcement Administration (DEA)
- 418.9750 Drug Enforcement Administration (DEA)

And finally this month, another contributor from New England who also wishes to remain anonymous, passes along this excellent list for the FBI for the New England area.

- 172.0750/165.9250 KCB800 "Central" Boston Admin repeater (A-1)
- 167.4875/63.9125 Surveillance repeater (A-2)
- 167.7875/165.4625 Surveillance repeater (A-3)
- 167.4375/162.6375 Surveillance repeater (A-4)
- 171.1750 Special Operations Group aircraft simplex, old SOG channel (A-7)
- 168.7250/????? KCB801 Providence, RI (B-1)
- 172.4500/????? Rhode Island (Interesting - first report of FBI activity on this frequency anywhere in the country)
[My notes indicate a Boston and Worcester Base/Mobile simplex channel-LVH] (C-1) 168.4250/
- 164.3750 KCB808 Hudson, MA (C-2)
- 167.2375/????? KCB812 Lowell, MA (C-3) [My notes indicate a repeater here in Foxboro with an input of 163.9875-LVH]
[My notes indicate a Boston Base/Mobile simplex channel-LVH] (C-6)
- 167.5625 Bugs/Wires (I have personally heard body wires on this frequency recently) (D-4) [This is a nationwide FBI simplex allocation-LVH]
- 173.9625/????? KCB803 Bedford, NH (E-1)
- 173.1500 (E-2) 167.4625/
- 162.9750 KCB804 Augusta, ME (G-4)
- 167.4625/162.7625 KCB806 Portland, ME (G-5)
- 169.5750/164.1250 SOG North Team, (North of Boston)* (J-1)
- 169.5750 SOG North Team Surveillance (J-2) 169.6250/
- 163.8875 SOG South Team (South of Boston)* (J-3)
- 169.6250 SOG South Team Surveillance (J-4)* Most surveillance communications are done on the simplex side of the above pairs - J2 and J4 Other confirmed FBI frequencies
- 167.1250 Linked with G-4, G-5, and 167.6125
- 167.2125 KCB814 Portsmouth, NH
- 167.2625 KCB805 Lakeville, MA
- 167.6125 KCB802 Springfield, MA
- 167.8250 Linked with the New Hampshire frequencies
- 171.6250 Linked with the C-3 frequency, 167.3875 and 167.7125
- 173.1500 Linked with 167.2125 and 167.7625
Call signs: Alpha 1, Delta 6/9-12, Echo 2-3/5 (Radio/electronic technicians), Foxtrot 3, Golf 16/18, India 2, Juliet 3, Lincoln 3-4/6-7/14/16-17, Maine 44, MS (Massachusetts) 28/30-33/35/37/62, Ocean 2/4/6-9/11/15-16/18, Papa 4/13/18, Quebec 2/11/16-17/20/24, Romeo 3-5/7-8/11/13/17-18, Tongo 2/5/7/10/13, Victor 1/4/6-12/14-17/19/21, Whiskey 8/25-26, Yankee 3/7/11-12/14/16-17/700 (Surveillance aircraft)

According to our reporter, the FBI is definitely the most active federal agency that is monitored in the Boston area. In contrast, the local Drug Enforcement Agency officers in 418 MHz range are just about 100 per cent scrambled. Once in a while you'll hear clear voice communications on 418.750 MHz.

And that will do it for this month. I hope you and your family all have a happy, healthy and warm holiday season from the Van Horn family here in Brasstown. 73 and good hunting, all.

Olympic-sized Trunking

The 2002 Winter Olympic Games will begin on February 8, 2002, when more than two weeks of athletic events will take place in and around Salt Lake City, Utah. An estimated one and a half million spectators are expected to attend the Games. As you might imagine, radio will play a big part in the rapid, smooth and safe functioning of each event. This month I'll try to describe the major trunked radio networks that will be operating during the Olympics.

As they have done many times in the past for such large events, the Federal Communications Commission has delegated the task of radio frequency management and coordination for the Games. The Salt Lake Organizing Committee (SLOC) will be the coordinator from December 1, 2001, through March 31, 2002, for the areas in and around Olympic activities. All broadcasters planning to work in one or more of the four radio zones (Salt Lake City, Park City, Ogden and Provo, see page 11) are required to coordinate their use of radio frequencies through SLOC in order to operate any wireless audio and video, data communication, two-way or other radio equipment.

❖ Olympic Safety

Besides broadcasters, public safety personnel will be very busy as well.

The federal government has allocated about \$200 million for security at the Olympic Winter Games, with the potential for more after the events of September 11. In addition, the State of Utah has contributed \$35 million and the SLOC budget has more than \$30 million earmarked for safety.

The Secret Service is the lead agency for security planning. The FBI is tasked with intelligence gathering and law enforcement response, while the Federal Emergency Management Agency (FEMA) is responsible for "consequence management," meaning they clean up if anything goes wrong. At the state level, the Utah Olympic Public Safety Command (UOPSC) is responsible for coordinating the activities of state and local law enforcement.

All told, there will be on the order of 5,000 to 7,000 law enforcement officers at the Games, along with several thousand additional security personnel hired through SLOC. Military personnel will also be on hand to provide assistance, so there should be a great deal of public safety radio activity.

SLOC, in concert with the State of Utah and the Utah Communications Agency Network (UCAN) has established a plan for their radio system. More than 7,000 two-way radios are expected to be in use, operating in either the 150 MHz or 800 MHz bands for both short range (within an event venue) and more distant communication.

❖ Utah Communications Agency Network (UCAN)

UCAN is a quasi-governmental agency created by the Utah State Legislature in 1997 to construct and operate a modern radio system on behalf of numerous state, local and private safety organizations. The idea is to transition these users away from older, incompatible systems in the 150 MHz and 450 MHz bands to a common 800 MHz trunked radio network.

Funding for the roll-out of the system comes from Federal grants, the state coffers, and monthly user fees of anywhere from \$15 to \$30 per radio, depending on whether the user is a state agency or not. In addition, last year Congress approved \$5 million for UCAN to upgrade security and communications equipment for use by law enforcement during the Olympics. Interestingly, the funding bill also included money to build and operate field-transportable radio direction finding equipment.

Phase 1 of the UCAN master plan provides for coverage in Davis, Morgan, Salt Lake, Summit, Tooele, Utah, Wasatch, and Weber counties, which amounts to about 80 percent of Utah's population.

❖ Valley Emergency Communications Center

Southwest of Salt Lake City in West Valley City is the Valley Emergency Communications Center (VECC), which provides dispatch services for 15 fire departments and 8 law enforcement agencies. 9-1-1 calls from about 20 different municipalities across a 120-square-mile area are answered at the VECC, averaging 3,500 calls each day. VECC is also the headquarters for UCAN.

Besides voice, VECC provides data services to police, fire, and rescue units using Cellular Digital Packet Data (CDPD) technology. Laptop units in vehicles are connected to CDPD modems and are able to access public safety databases, letting officers

run license checks and warrant requests without the need to talk with a dispatcher.

Future plans include "voiceless dispatch" in which assignments are done over the CDPD connection rather than by voice. This would free up officers and dispatchers from having to handle routine messages and allow more information about the assignment to be delivered to the officer in less time. Information such as mug shots, fingerprints, and photographs could be delivered at the time of dispatch, allowing the officer to be better prepared for the assignment.

Rather than requiring new base station equipment, the CDPD service uses the existing cellular telephone network. A vehicle can be equipped with a laptop and CDPD modem for less than \$1800, and monthly service charges from the cellular provider are about \$50.

❖ UCAN SmartZone

The UCAN network is a Motorola Type II SmartZone system with a number of sites. Sites are grouped together into cells, with transmissions being simulcast from each site in a cell. This is a rather large and complex system, with a lot of frequencies. What follows is a compilation of the first eleven cells, which handle the majority of calls.

Weber County (cell 1): 866.950, 867.275, 867.300, 867.5875, 867.6125, 867.900, 867.925, 868.2375, 868.2875, 868.9625 and 868.9875 MHz.

Davis County (cell 2): 866.925, 867.175, 867.200, 867.225, 867.450, 867.475, 867.8125, 867.8375 (data), 867.850, 868.150, 868.175, 868.600 and 868.850 MHz.

Salt Lake County (cell 3): 866.875, 867.150, 867.175, 867.400, 867.425, 867.6875, 867.725, 868.0875, 868.1125, 868.4125 and 868.5125 MHz.

Utah County (cell 4): 866.725, 866.975, 867.0875, 867.325, 867.375, 867.6625, 867.950, 868.0625, 868.3375 and 868.3625 MHz.

Reservoir Hill (cell 5): 866.0625, 866.3375, 866.6125, 867.1375 and 867.8625 MHz.

Promontory Point (cell 6): 866.2500, 866.5750, 866.7375, 868.3500 and 868.7000 MHz.

Mt. Ogden (cell 7): 866.1500, 866.1875, 866.4375, 866.5500, 866.7625, 866.8000 (data), 868.6250, 868.6500, 868.8750 and 868.9000 MHz.

Morgan Peak (cell 8): 866.1125, 866.3875 and 866.7125 MHz.

Francis Peak (cell 9): 866.4875, 866.2250, 868.6750 and 868.8250 MHz.

Layton (cell 10): 868.750, 868.775, 868.7875 and 868.800

MHz.

Nelson Peak (cell 11): 866.3750, 866.4000, 866.6500, 866.7000, 866.9000 and 868.5500 MHz.

Aeromedical: 17184, 17216, 17248 and 17312

Davis County Fire: 9600, 9632, 9664, 10656, 10688, 10752, 10784, 10816, 10848, 10880 and 10912

Davis County Sheriff: 9312, 9376, 9408, 9728, 11776 and 11776

Orem Police Department: 44604, 44608 and 44672

Tooele County Sheriff: 40000 and 40032

Utah County Fire: 46240

Utah County Sheriff: 46112

Utah Highway Patrol: 9440, 19712 and 19744

Utah State Fire Air 17184 and 17216

Wasatch County Sheriff: 47200, 47264

Weber County Sheriff: 6016 and 6048

Salt Lake County

UCAN is expected to fully interconnect with Salt Lake County's existing radio system, which is a 800 MHz Motorola system spread across several repeater sites.

Frequencies are 854.5875, 854.7125, 855.4625, 856.2375, 856.7125, 856.9875, 857.2375, 857.4625, 857.7125, 857.9375, 858.2375, 858.4625, 858.7125, 859.2625, 859.4625, 859.7125, 859.7375, 860.2625, 860.7375, 866.0750, 866.3500, 866.6000, 866.6750, 866.8500, 867.2500, 867.7750, 868.0375, 868.4375 and 868.9375 MHz.

Salt Lake City fire talkgroups include 832, 864 and 896 while County fire uses 928, 960, 972, 976 and 992. Medical rescue talkgroups are 1408 and 1440.

Salt Lake City police use talkgroups 672, 704, 720, 736, 768 and 800. County Sheriff calls appear on a number of talkgroups, including 240, 272, 304, 336, 432, and 416. SWAT and Special Operations use 608 and 640.

Salt Lake City, Utah

Salt Lake City operates a Motorola Type I system. TrunkTracker listeners should use Fleetmap E1 P3.

Frequencies are 856.7625, 856.9625, 857.7625, 857.9625, 858.7625, 858.9625, 859.7625, 859.9625, 860.7625 and 860.9625 MHz.

Since UCAN, Salt Lake County and Salt Lake City all use Motorola 800 MHz trunked radio systems, there is a proposal in the works to use a SmartZone OmniLink switch to tie them all together. This would also allow Department of Justice and Department of the Treasury wireless networks to be linked in.

Salt Lake City Airport

The Salt Lake City airport runs a Motorola Type II system using frequencies of:

856.4875, 856.9875, 857.4625, 857.4875, 858.4875, 859.2375, 859.4875, 860.2375 and 860.4875 MHz.

Talkgroups 1200 and 1360 are used by the Salt Lake City Fire Department, while 528, 530, and 1136 are assigned to the airport medical rescue units. Airport Police are dispatched on talkgroups 592 and 1232 while Operations uses 848 and 880.

Latter-Day Saints Church

Salt Lake City may be best known as the headquarters of the Latter-Day Saints (LDS) Church, better known as the Mormons. They operate their own Motorola trunked radio system using the frequencies: 855.2625, 855.3375, 855.5625, 856.8375, 857.8375, 858.8375, 859.8375 and 860.8375 MHz.

Orem, Utah

The city of Orem in Utah County is licensed to operate a Motorola Type II system on the following frequencies:

866.2250, 866.4250, 866.4500, 866.6250, 866.8375, 866.8875, 867.0875, 867.1375, 867.2375, 867.2875, 867.4875, 867.5750, 867.7250, 867.8875, 867.9375, 868.2875, 868.4250, 868.6125, 868.6250 and 868.9000 MHz.

Note that some of these frequencies overlap with UCAN assignments. Could a Utah reader confirm that the Orem system has been absorbed by UCAN?

Provo, Utah

The city of Provo, also in Utah County, has the following frequencies assigned for a Motorola Type II system:

851.8125, 852.3875, 854.8875, 855.2625, 855.3375, 855.5375, 855.5625, 855.8125, 856.3875, 856.8625, 856.9125, 857.9125, 858.2125, 858.8875, 858.9125, 859.9375, 859.8875, 859.9125, 860.8875, 860.9125, 861.1375 and 865.1875 MHz.

The system may also be absorbed by UCAN.

Hill Air Force Base

Hill Air Force Base in Davis County operates their own Motorola Type II system in the 400 MHz band. The system follows the UHF standard of 25 kHz steps and has a base frequency of 406.000 MHz. Actual frequencies in use are:

406.150, 406.750, 407.250, 407.525, 408.025, 408.550, 408.950, 409.150, 409.750 and 406.2500 MHz.

The base fire department has been heard on talkgroup 10720 while flightline operations is on 9760.

Tooele, Utah

Perhaps reduced in size by now, the world's largest single stockpile of chemical weapons is located 45 miles southwest of Salt Lake City in a town called Tooele (pronounced too-ELL-ah) at the Army's Desert Chemical Depot. Since 1996 Tooele's mission has been to safely incinerate the thousands of tons of U.S. chemical weapons.

The depot is reported to operate a five-channel Motorola Type II system on the following UHF frequencies: 406.350, 407.150, 407.950, 408.750 and 409.550 MHz.

❖ Computerized Talkgroup Logging

While scanning trunked frequencies, it is often a manual chore to write down each talkgroup that appears on the scanner display. An MT reader just might have the solution for this problem.

I am an MT subscriber and I enjoy reading your Tracking the Trunks section. I have written a program for the Bearcat 245XLT and 780XLT scanners that may be of interest to your readers. I am a programmer by profession but I also write my own software as part of my radio hobby.

I originally wrote the program for my own use to collect new IDs for my web page. I decided to release it as freeware so that others may get some use from it. The software can be found at: <http://personal.lig.bellsouth.net/lig/k/d/kd5eis/IDTracker/IDTracker.htm>

David, K5DMH, Baton Rouge, LA

David's software runs under Microsoft Windows and requires a serial connection to either a Bearcat 245XLT or a 780XLT. Talkgroup IDs from Motorola or EDACS systems are displayed and optionally logged to a disk file. His web page has comprehensive explanations of the program's features and an easy-to-use download section.

That's all for this month. I welcome your electronic mail messages at dan@signalharbor.com, and there is more information on my web site at <http://www.signalharbor.com>. Until next time, happy monitoring!

NOTICE: It is unlawful to buy cellular-capable scanners in the United States made after 1993, or modified for cellular coverage, unless you are an authorized government agency, cellular service provider, or engineering/service company engaged in cellular technology.

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A Christmas Bonus

Welcome aboard and Happy Holidays to everyone! Today as a special treat, we have an all-frequency column! Enjoy! All frequencies, including the airline companies, are valid as of this past September.

◆ Airline Companies

These were contributed by David Page from Kentucky. Thanks, Dave!

ACARS: 129.125 130.025 130.425 130.450 131.125 131.550 136.750 136.800 136.850
 ARINC: 129.350 130.200
 AV Center/SDF: 129.900
 Air Mobility Command: 130.650
 Air Wisconsin: BNA - 131.075 LEX - 131.050
 AirTran Airways: BMI - 131.600 BMI - 130.825
 AirTran Airways: 131.350 131.800
 AirTran Airways: ATL - 130.250 ATL - Maint 129.175
 Airborne Express: ATL - 131.500 131.875
 America West: 128.850 129.625 130.175 130.850; CMH ATL IND - 131.500
 American: BNA - 129.225 129.325 131.875; BNA CVG - 129.200
 American Dispatch: 129.975 130.250
 American Eagle: BMI - 131.600 129.725 130.475 130.95; BNA HSV - 131.950; CVG - 131.500; FWA - 131.150
 American Trans Air (AmTran): 129.375 131.850; IND - 129.425 131.525; MDW - 130.975
 Atlantic Coast Airlines: BMH - 121.025; BNA - 131.075; SDF - 128.950
 Atlantic Southeast: EVV - 131.000 131.025; LEX - 131.450
 Averitt: BNA - 131.375
 Casino Express: BNA - 131.950
 Chautauque Airlines: EVV - 129.800; LEX - 129.000; SDF/TYS - 129.750; TYS - 129.100
 Comair: 129.650 131.600; BNA - 131.450; CHA - 129.000; CVG - 130.300 131.725 CVG Maint. - 128.825; IND - 129.550; SDF - 131.850 SDF TYS EVV - 131.025; STL - 131.725
 COMAR Aviation: BWG - 123.000
 Continental: ATL IND CLE - 129.925; DTW - 129.050; IND - 131.750
 Continental Express: BMH - 131.750; BNA CVG SDF - 130.525; IND STL - 129.925; MEM TYS MCI DAY - 131.200
 Corporate Airlines: SMY - 131.900
 Corporate Express: BNA - 129.725
 DHL (freight airline): CVG - 129.475; Flight Control/DTW - 131.625; Maint. - 130.750
 Delta: 129.650; MEM - 131.375; ATL CVG SDF DAY - 129.550; ATL Gatekeeper - 128.875; ATL Radio - 129.500 129.600; SDF - 131.850; ATL/Special Assist. - 129.675; BNA - 131.450; CVG - 130.375 130.900
 CVG Gatekeeper - 131.950 Maint. - 131.275
 Emery World-Wide: 130.850; DAY/Maint. - 130.950; Dispatch - 136.525
 Epps Aviation: DKB - 129.050
 Express Airlines I: CVG - 131.250; EVV MEM - 131.750; LEX - 130.925
 FEDEX: MEM - 129.675 MEM CVG IND - 131.825
 FEDEX: MEM - Maint. IND - 130.800; MEM STL TYS IND CVG - 131.925
 Japan Airlines: ATL - 128.825
 Lufthansa: 130.125

Mercury Aviation: BNA - 131.600; PDK - 131.650
 Mesa Airlines: BNA - 130.200; SDF - 129.750
 Midcoast Aviation: CPS - 131.350
 Midwest Aviation: PAH - 123.00
 Midwest Express: ATL - 131.000
 Nashville Flight Service: TOL - 130.925
 Nashville Jet Center: BNA - 129.825
 Northwest: BNA MEM - 131.750; CLE - 131.650; CVG - 131.250; Northwest Dispatch IND - 130.350; Northwest MPS - 129.050 129.300 129.550; MPS DTW Maint. - 129.925; SDF - 129.375 129.950 130.125
 Northwest Airlink: 128.825; SDF LIT - 129.375; MSP Freight - 129.150; Northwest Airlink: Twin Cities - 129.025
 PSA: BNA - 129.750
 Prompt Air: BNA - 131.875
 Ryan: 130.825; IND - 130.150
 Signature Flight Support: 128.900; BNA - 131.100
 Southwest: 129.250; Dispatch - 131.700; MDW - 129.275; BNA SDF - 130.125
 Spirit Airlines: 130.325; Dispatch - 129.425
 Stevens Aviation: BNA - 130.575; DAY - 130.600
 Sunworld: 131.950
 Sunbird Air Services: 129.050
 TAC Air: LEX - 129.875
 TWA: BNA STL - 129.625; IND Dispatch - 129.100 IND - 130.225; MSP - 129.900; SDF - 131.050; STL - 130.975 STL Maint - 129.850; Nationwide - 131.300
 TWA Express: EVV - 129.000; STL - 130.625
 Tri States: EVV - 129.675
 UPS: CVG - 131.250 SDF - 129.425 130.550 130.675 131.675
 USAirways: 130.000; BNA SDF - 129.750; CLT - 130.375; SDF COL - 130.100
 United: IND - 130.175 130.575; ORD - 129.075 ORD Dispatch - 129.450
 Unk FBO: CMH - 131.350
 Vanguard Airlines: ATL - 130.275

Key to Airport Abbreviations

ATL - Atlanta, GA
 BMI - Bloomington, IL
 BNA - Nashville, TN
 CLE - Cleveland, OH
 CMH - Columbus, OH
 CPS - St. Louis, Bi-State
 CVG - (Covington)-Cincinnati International
 DAY - Dayton, OH
 DKB - DeKalb, GA
 DTW - Detroit, MI
 EVV - Evansville, IN
 FWA - Fort Wayne, IN
 HSV - Huntsville, AL
 IND - Indianapolis, IN
 LEX - Lexington, KY
 MCI - Kansas City, MO
 MDW - Midway Airport (Chicago)
 MEM - Memphis, TN
 MSP - Minneapolis/St. Paul International
 PAH - Paducah, KY
 PDX - Portland, OR

SDF - Standiford Field, Louisville, KY
 STL - St. Louis, MO
 TYS - Tyson Field (Knoxville, TN)

◆ Farewell TWA

In this issue, we bid TWA a fond farewell. They will soon be absorbed into American Airlines, and then TWA will cease to exist as a separate entity.

For many years, I've considered TWA my favorite airline and have enjoyed many flights from the Connie to the 757 and 767. The cabin crews are the best on a domestic airline, and the flight deck contingent were as helpful and polite as could be. I was always asking for frequencies and the pilots were more than happy to oblige. My thanks go to the reservationists, ticket, transportation assistance folks, and gate agents, especially during the many times when I had to depend upon a wheel chair and transportation folks to arrive at my gate.

Best of luck to each and every one of you.

Quick Joke:

Do you know the difference between an airline pilot and a jet engine? The engine stops whining at the gate.

◆ Los Angeles Center (KZLA)

KZLA (R): 128.2 132.500 284.7 351.7 ARR/DEP US: 119.000 126.000 126.400 127.400 128.050 132.150 133.400 134.400 134.550 135.450 269.500 285.500 285.600 291.700 307.800 322.400 338.300 343.700 348.700 350.300 354.100
 Bakersfield: 127.100 133.050 135.300 263.000 317.700 372.000
 Baldwin Hills: 119.950 125.27 132.850 277.400 322.400 351.700
 Barstow: 126.350 132.300 132.500 133.550 134.650 135.575 279.600 290.200 317.400 314.200 351.900
 Blythe: 128.150 135.450 285.600 307.800
 Boron: 132.635 283.600
 Cedar City: 124.200 127.350 133.600 135.250 135.550 271.200 343.6 346.300 398.900
 Julian 125.650 125.850 127.400 128.150 128.600 135.450 135.750 227.7.400 285.600 291.700 307.800 346.400 354.100
 Keeler: 127.900 32.625 283.600 377.1
 Mount Potosi: 121.500 124.625 132.625 243.000 283.600 377.100
 Nelson: 124.200 124.850 134.650 319.200 360.650 343.600
 Ontario: 125.850 346.400
 Riverside: 126.350 290.200
 Saddle Peak: 125.800 132.600 134.750 307.100 351.800 398.850
 San Luis Obispo: 119.050 124.150 128.700 269.500 307.000 327.800
 Santa Barbara: 119.050 132.150 134.425 135.500 269.500 327.100 338.300 3 346.300
 Santa Catalina: 134.575 354.1
 Seligman: 124.200 124.850 133.200 134.950 282.300 319.200 323.200
 Tonopah 125.750 127.900 132.050 133.450 291.700 319.800 377.100
 TwentyNine Palms: 121.500 128.150 133.200 243.000 282.300 285.600
 Yuma: 121.350 278.500

❖ Oakland Center (KZOA)

Angels Camp: 119.750 121.250 126.850 127.950 132.950 134.375
281.500 284.600 290.400 326.100 319.900 327.000
Bishop: 125.750 319.800
Fallon: 128.800 134.450 269.300 285.500
Ferndale: 134.150 387.100
Fresno: 123.800 126.900 132.800 133.700 134.375 281.500
285.400 343.800 353.800
Half Moon: 119.475 125.450 127.450 133.050 134.150 307.300
357.600 387.100
Mina: 125.500 132.050 273.450 319.800
Mt. Tamalpais: 125.850 127.800 323.00 353.500
Priest: 126.900 128.700 132.800 133.700 134.550 285.400 290.500
307.000 319.100 343.800
Red Bluff: 132.200 133.375 134.975 269.100 290.300 350.300
Reno: 128.800 134.450 269.300 285.500
Sacramento: 127.950 132.950 269.100 316.100
San Luis Obispo: 128.700 307.000
Tonopah: 125.750 132.050 273.450 319.800
Uliah: 127.800 132.200 133.375 134.975 281.400 306.200 353.500
379.200

❖ Seattle Center (KZSE)

KZSE (R): 129.300 126.600 306.200 343.6
Antelope Mountain: 124.850 306.300
Beacon Hill: 120.300 13.525 273.600 353.900
Cottonwood: 123.950 118.550 282.300 251.100
Dallesport: 126.600 343.600
Ferndale: 124.850 135.150 306.300 360.700
Fort Lawton: 128.500 306.900
Horton: 121.400 125.800 132.075 257.650 239.000 243.000 291.700
Kimberly: 135.340 281.400
Klamath Falls: 125.975 127.600 263.050 351.700
Klickitat: 122.250 343.500
Lakeside: 123.950 282.300
Lakeview: 127.600 135.350 243.000 335.550 351.700
Larch Mountain: 128.300 126.600 269.0 343.6
Marlin: 126.100 291.600
Medford: 121.400 124.850 135.150 239.00 306.300 360.700
Mohler: 128.450 307.800
Mullan Pass: 128.450 307.800
Neah Bay: 125.100 243.00 319.200
Redmond: 128.150 121.350 134.900 135.350 257.750 263.050 279.600
355.550
Rex-Parrett: 121.350 279.600
Scappoose: 124.200 128.150 257.750 317.600
Nassel: 124.200 317.600
Spokane: 119.225 123.950 282.300 335.500
Stampede Pass: 134.950 270.300
The Dalles: 119.650 135.450 257.6 281.400
Walla: 132.600 321.300 269.350
Wenatchee: 126.100
Whidbey Island: 125.100 134.950 270.300 319.200
Yakima: 118.550 120.300 132.600 135.525 251.100 269.350 273.600
353.900

Oh No, Not Another Joke

Continental flight 400 was just about to depart the runway on takeoff when they spotted a dead animal just as the wheels left the ground. "Continental 400, contact Departure on 125.500, good day!" radioed the Tower Controller. "125,500, for departure and before we go, we just spotted a dead animal on the runway." "Roger, and thanks" said the controller; then, without missing a beat, he said to USAir 333: "USAir 333, you're cleared for immediate takeoff on Runway 31; incidentally did you hear Continental 400's report of a dead animal on the runway?" "USAir 333 cleared for takeoff on 31," echoed the USAir pilot, and added: "Yes,



we monitored Continental's report and we've just notified catering...."

❖ Salt Lake City Center (KZLC)

Ashton: 128.350 132.400 338.300 381.600
Baker: 128.050 387.150
Battle Mountain: 128.725 132.250 269.000 352.000 363.150
Big Piney: 128.350 381.600
Billings: 127.750 351.900
Blackfoot: 128.350 381.600
Bliss: 118.050 128.550 363.000 397.900
Boise: 118.050 269.050
Bozeman: 132.400 338.300
Bryce Canyon: 133.600 269.250
Burley: 118.050 363.000
Butte: 132.400 133.400 285.400 338.300
Cascade: 121.500 399.000
Cedar City: 122.200 124.200 125.575 127.350 135.250 135.550 299.200
343.600 346.300 381.450 398.900
Delle: 128.550 132.025 380.050 380.550
Delta: 125.575 370.850 381.450
Elko: 129.725 132.250 269.000 363.150 352.000
Ely: 133.450 397.850
Fairfield: 133.900 370.850
Francis Peak: 119.950 127.700 135.775 257.700 377.150 387.050
Glasgow: 126.850 305.200
Great Falls: 132.425 133.400 285.400 319.000
Green River: 124.350 353.500 291.600
Hanksville: 133.600 135.375 269.250 303.600
Jackson: 127.300 132.500 133.250 259.100 285.200 285.600
Judith Mountain: 126.850 133.400 305.200 285.400
Lakeside: 133.400 285.400
Lovell: 133.250 285.600
Malad City: 126.750 379.250
Miles City: 126.850 305.200
Missoula: 133.400 285.400
Myton: 119.950 135.775 257.700 377.150
Rome: 121.150 128.050 379.100 387.150
Salmon: 132.400 338.300
Sheridan: 127.750 351.900
Squaw Butte: 128.050 121.500 387.150 399.000
Sunnyside: 125.575 127.925 133.900 370.850 380.350 381.450
Thermopolis: 124.350 133.250 285.600 353.500
Tonopah: 125.750 127.900 132.050 133.450 291.700 319.800 377.100
387.850
Watford City: 126.850 305.200
Wilson Creek: 127.925 133.450 134.525 278.100 380.350 397.850
Winnemucca: 132.250 363.150 380.050

And Another Joke

O'Hare was closed, due to extremely heavy rain and all the inbound flights were being diverted to other airports not in the path of the lousy weather. American 575 was diverted to Indianapolis and as they drew near to final approach, the first officer called the company station at Indy to announce their arrival. He didn't know that their company station there had already accepted 25 diversions from O'Hare already. He cheerily says, "Good evening, Indy. Here's 575 coming at 'cha. Where should we put this bird when we get on the ground?" There

was dead silence for about 10 seconds, and then the Station Manager, with remarkable control, said "Call me when you get on the ground and we'll discuss it then."

❖ Atlanta Center (KZTL)

(The Air Traffic Control source who contributed this was kind enough to show some designated feet and levels covered (i.e. surface to 12,000; Flight Levels, etc.)

KZTL (R): 125.900 128.000 (FL 330 and above) 135.0 264.200 273.600
279.200 306.200 327.800 343.900
Albermarle: 133.150 251.100
Anniston: 134.950 306.200
Athens: 120.425 124.450 127.500 254.350 316.050 327.150
Atlanta (R): 135.000 317.700
Augusta: 128.100 323.000
Birmingham: 134.050 128.725 261.500 306.250
Black Jack Mountain: 127.050 370.900
Chattanooga: 124.875 126.675 132.050 133.175 270.600 299.200
353.800 363.100
Columbus: 120.450 125.575 239.350 357.600
Crossville: 133.600 (132.675 & 279.500 FL 330 and above) 125.925
236.70 254.300
Foothills: 124.375 380.350
Gadsden: 133.800 353.700
Glade Springs: 127.850 371.850
Greensboro: 124.425 128.800 343.800 379.200
Hampton: 124.325 & 380.150 FL 330 and above 126.475 127.125 128.000
343.900 363.250 371.950
Hickory: 125.150 (132.975 & 307.350 FL 330 and above) 134.550
263.000 290.200
Huntsville: (126.825 & 354.050 FL 330 and above)
Jonesville: 119.575 (125.025 & 291.750 FL 330 and above 257.900
Macon: 119.575 257.900 (134.500 & 360.750 FL 330 Surface to FL 290)
123.950 126.425 273.600 335.650
Monroeville: 118.550 267.900
Montgomery: (125.875 134.600 308.600 319.100 FL 330 and above)
120.550 128.025 270.250 280.100 290.500
Mt. Oglethorpe: (134.800 290.800 307.900 Surface to 10,000) 121.350
290.800 377.050
Newport: 127.550 (134.075 236.500 FL 330 and above)
Owing: 123.725 125.625 135.350 269.100 319.250 327.000
Pine Level: 307.150 335.600
Sugarloaf Mt.: 132.625 281.100
Tri City: 120.725 126.775 132.900 301.400 319.900 354.150
Uniontown: 132.250 133.250 252.900 297.400 339.100 352.800

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Broadcasting and the NYC attack

The horrible image of New York's twin towers collapsing on September 11 will be with us for a long time to come. Much attention has been paid (justifiably!) to the public service workers, firefighters, and police officers who gave their lives trying to get people out of the buildings. Much attention has also been given to the hundreds of financial workers employed in the buildings, most of whom escaped, many of whom didn't. There was another category of people working in the World Trade Center. While much fewer in number, their work was probably more familiar to the DXer, and like the others, they lost their lives while doing their job.

If you saw the video of the collapse of the north tower, you saw a large white pole coming down atop the tower. This pole held the transmitting antennas of nine TV stations, a TV translator, and four FM stations. Six television engineers were working at their transmitter rooms atop the building when the attack occurred, and all six are missing and presumed dead. Two – Bob Pattison and Isaias Rivera – worked for WCBS channel 2; Rod Coppola worked for WNET channel 13; William Steckman was an employee of WNBC channel 4; Donald DiFranco was with WABC channel 7; and Steven Jacobson was an engineer for WPIX channel 11. Some of these men had been through the 1993 bombing in the basement of the north tower; one must presume they had no idea it could happen again.

Of course, it's secondary to the horrible loss of life, but the fourteen stations involved did lose their transmitting facilities as well. WCBS channel 2 was the first to return to the air. When the other eight stations moved their transmitters to the new World Trade Center in the early 1970s, WCBS never removed their old transmitter from the Empire State Building. They were able to quickly return to the air with the old transmitter. WNYW channel 5 had its digital TV facility in the Empire State Building, and was able to quickly install a temporary analog transmitter there. WWOR channel 9, recently purchased by the same company that owns WNYW, was also able to establish a temporary analog transmitter in the Empire State Building.

Most of the remaining stations – channels 4, 7, 11, 13, and 47 – have set up temporary transmitters at the historic Armstrong tower in Alpine, New Jersey. This tower was erected in the 1930s by Edwin Armstrong for his early demonstrations of FM broadcasting. More recently, it has been used mostly for two-way radio service and cellular telephones, though FM

station WFDU does use the site. As of late September, New York's Pax affiliate, WPXN channel 31, has not returned to the air, though its programs are being carried on two low-power stations on channels 23 (New Jersey) and 38. (Long Island) WPIX channel 11 has also re-established a relay transmitter from the Empire State Building on channel 64.

Also atop the north tower were the antennas of four FM radio stations. WKCR (89.9), WPAT (93.1), WNYC (93.9), and WKTU (103.5) were all knocked off the air. Like WCBS-TV, WKTU had a backup transmitter on another building, and promptly returned to the air. The other three stations found temporary sites elsewhere in the city, and were all back on the air within two weeks. Luckily, no radio engineers were in the World Trade Center when the attacks occurred. A widespread report that a WAXQ-FM announcer had been killed in the attack luckily proved inaccurate. Most of New York's AM transmitters are in New Jersey, or the Bronx, so they were not affected by the attacks. Programming, on the other hand, was drastically changed!

The Armstrong tower site will not be suitable for permanent TV transmission to New York. It's not high enough; the skyscrapers of Manhattan block reception in areas of Brooklyn and Queens. The World Trade Center most likely will be rebuilt, but it will take years to do so. It's unlikely the Empire State Building can accommodate both analog and digital transmissions of all nine stations. Other sites that have been suggested include the Chrysler Building, the Citibank Building, and a traditional guyed tower on Staten Island.

It may be a final sign of defiance... that the top of an antenna pole survived the collapse of the building. A firefighter found the pole sticking out of the rubble – climbed it – and planted an American flag.

♦ Bits and Pieces

- In August, I asked for some of your better

Deer Point, Idaho, is home to Boise's FM & TV transmitters.



regional-channel loggings. Patrick Martin in Seaside, Oregon, mentioned some that will be hard to beat. One evening, WEGP-1390 Presque Isle, Maine, had scheduled a DX Test (a special broadcast with daytime power and Morse Code identification). Patrick stayed up late to try for the WEGP test, and succeeded. That's a feat in itself.

But there was an unidentified country music station interfering with WEGP. The station would frequently identify as "Bubba FM." Finally, after a few minutes, the country station gave its call letters: "This is WXTC, 1390 AM." Charleston, South Carolina. Maine and South Carolina, at the same time, from the Oregon coast – that would be quite a feat on a clear channel. On crowded 1390 kHz, it's simply amazing!

- There's a new expanded-band station to report this month. KYEA-1680 Monroe, Louisiana appeared in late September, carrying gospel music. This station appears in many lists as KBJE; they had a last-minute callsign change.

- Also new this month are permits for six new AM stations. "Graveyard" stations, with 1 kilowatt nondirectional fulltime, have been authorized at Waycross and Moultrie, Georgia (1230 and 1400 kHz); Redmond, Oregon (1240); and Malmstrom Air Force Base, Montana (1490; this is adjacent to Great Falls). A station authorized for Pierce, Colorado, near Fort Collins, will run 1kW daytime/750 watts night on 870 kHz. And one in Artesia, New Mexico, will run 10kW daytime/250 watts night on 1280. There are several more applications for new AM stations "in the pipe," and likely to be granted soon.

Are you hearing anything interesting on the dials? Write me at Box 98, Brasstown NC 28902-0098, or by email to w9wi@w9wi.com. Good DX!

Alleged Cuban Spy Used Numbers

During a September 21 arrest of the Defense Intelligence Agency's senior analyst for Cuba, federal prosecutors accused Ana Belen Montes of being a double agent for Cuba while on the US payroll. According to the *Washington Post*, an FBI affidavit in the case said that Cuban spies often receive instructions consisting of "encrypted messages at high frequencies via shortwave radio." Montes, of suburban Washington, was jailed without bond. The incident was the most prominent public discussion of "spy" numbers station activity in many years.

◆ Holiday Pirate Activity Zooms

In 2001, as in past years, shortwave pirate radio activity has inevitably increased around holidays. During the Thanksgiving, Christmas, and New Years season, we can expect this traditional pattern to continue. If Santa brings a new receiver, why not test it out on 6955 kHz?

◆ What We Are Hearing

All of these pirates were logged by *MT* readers this month. The stations operate near 6955 kHz, but they will use frequencies 5 to 10 kHz around that spot.

Blind Faith Radio- Doctor Napalm still spins classic rock tunes, but he often comments on current affairs as well. (Uses blindfaithradio@yahoo.com e-mail)

Buckwheat Radio- The ancient guitar selections on this one is announced with a transmitter power of only ten watts! (None)

East Coast Beer Drinker- Here's a veteran pirate with a typical pirate program content format. Pop music, sketches, and comedy are normally heard here. (Blue Ridge Summit)

He Man Radio- Network radio host Art Bell gave He Man a plug while interviewing pirate author Andrew Yoder during the fall. He Man reciprocated with a pirate broadcast. (Blue Ridge Summit)

KRAQ- Few people heard their tests, and we don't know much about them yet. (None)

KRMI- Radio Michigan International says that their rock music comes to us from Port Huron, Michigan. (Uses KRMI6955@hotmail.com e-mail)

Psyco Radio- Late in the year they sometimes used a station slogan of "Ultra Shortwave." (Uses psycoradiohd@yahoo.com e-mail)

Radio Bingo- The radio bingo game doesn't always mutate into a UPR parody. (Merlin)

Radio Doomsday- Many tapes of this classic pirate have resurfaced in memorium to the late Kirk Trummel. (None current)

Radio FCC- Their oldies used an unusual frequency of 13915 kHz. If you think that the FCC really operates this one, then you need to think again. (None)

Radio Free Euphoria- Captain Ganja has a new web site, accessible via <http://www.geocities.com/captainganja14711/index.html> on the internet. (Belfast)

Radio Three- Sal Amoniac used to play insipid pop tunes as a parody of himself, but his tunes have improved as he adopted a "Three Rock" slogan. (None, QSLs logs in *The ACE*)

Radio Toronto- The fare is eclectic on this one, from oldies rock to interviews with Toronto residents while they are on the job. (Merlin)

Rainbow Radio- This new one has not been widely heard, but they appear to be a rock music station. (None)

Take It Easy Radio- As you might expect from the station name, Eagles music is a staple on this veteran pirate. (Belfast)

United Patriot Militia Bingo- The parody of United Patriot Radio still has bingo games to raise money for the fictional patriots, usually with cameo appearances from pirate radio figures. (Merlin)

United Patriot Radio- As you might expect, their 6900 kHz upper sideband signal has been full of heated commentary about the war. Recently they have aired satellite feed programs as often as they have produced their own shows. (Somerset)

Voice of the Angry Bastard- Despite their confrontational name, recent programming here has mainly been related to promotions for shortwave pirate broadcasting. (Belfast)

WARR- A war station using American Anti-Terrorist Radio as a slogan has emerged on 26500 kHz. Surprisingly, the only log we received on this one was from Horacio A. Nigro in Uruguay! It might pay to check out this high band during daylight hours. With Afghanistan largely inaudible on 7085 kHz in North America, pirates dominate the unlicensed broadcasting on the war right now. (None)

WHYP- The James Brownyard memorial station always carries a complex mix of rock music, sketches. But, strange sound bytes, from James and other pirates are the signa-

ture feature on this one. (Providence)

WMFQ- This one always plays rock music, but their distinctive feature remains their chanting IDs that always refer to QSLs. (Providence)

WVDA- They were a new one this year, but by now their rock and drama programming is getting well known. (Uses wvdapirate@yahoo.com e-mail)

Z-100- There always have been a few pirates who simply imitate commercial FM rock stations. This one is the most active current example of the genre. (Uses bigz100fm@yahoo.com e-mail)

◆ How to QSL Pirates

Reception reports to pirate stations require three first class stamps for USA maildrops or \$2 US to foreign locations. The cash pays postage for a souvenir QSL to your mailbox. Letters go to these addresses: PO Box 1, Belfast, NY 14711; PO Box 28413, Providence, RI 02908; PO Box 109, Blue Ridge Summit, PA 17214; 245 Elrod Martin Road, Somerset, KY 42503; and PO Box 293, Merlin, Ontario N0P 1W0, Canada. A few pirates prefer e-mail, bulletin logs or internet web site reports instead of snail mail correspondence. Reports to the *Free Radio Network* (FRN) go to <http://www.frn.net/> on the web. *Free Radio Weekly* loggings go via niel@ican.net e-mail. Sample copies of *The ACE* are \$2 via the Belfast maildrop.

◆ Thanks

Your input is always welcome via PO Box 98, Brasstown, NC 28902, or via the e-mail address atop the column. We thank all of our contributors: Gabriel Ivan Barrera, Argentina; Kirk Baxter, North Canton, OH; Jerry Coatsworth, Merlin, Ontario; Ross Comeau, Andover, MA; Bill Finn, Philadelphia, PA; Harold Frodge, Midland, MI; Captain Ganja, Belfast, NY; William Hassig, Mount Prospect, IL; Ralf Haenggi, Gfell, Switzerland; Mike Horton, Memphis TN; Harald Kuhl, Germany; Chris Lobdell, Stoneham, MA; Greg Majewski, Oakdale, CT; Bill McClintock, Minneapolis, MN; Alan P. Masyga, Winona, MN; Horacio A. Nigro, Montevideo, Uruguay; Mark Redfox, Albuquerque, NM; Lee Reynolds, Lempster, NH; Martin Schoech, Merseburg, Germany; Tom Severt, Frontenac, KS; Lee Silvi, Mentor, OH; Bryan Smith, Tyrone, PA; Chris Smolinski, Maryland; Bud Stacey, Setsuma, AL; Jeff White, Miami, FL; and Niel Wolfish, Toronto, Ontario.



19 Countries on Longwave!

In October, I had the pleasure of attending a weeklong DXpedition at a remote site in New Brunswick, Canada. The event was the brainchild of Jacques d'Avignon, (VE3VIA), Propagation editor for *Shortwave Magazine*. Jacques and fellow DXer Ken Alexander (VE3HLS) traveled to the site in the spring of 2001 to survey the lodging facilities and prospects for installing antennas. They also set up portable receiving equipment to test the radio conditions. Their results were encouraging, and confirmed that the site would be ideal for medium and longwave DXing. In fact, Jacques commented that the noise floor at this location was the lowest he had experienced in 50 years of monitoring.

We knew that the Oceanside location would be well suited for European and African intercepts, so this became the focus of our efforts at the DXpedition. Two Beverage antennas were installed, one 500 feet long, another 1,000 feet in length. The ends of the wires were directed toward Europe and Africa and were terminated with 450-ohm resistors to copper ground stakes. An array of aboveground radial wires at each ground stake completed the installation.

To classify our results as amazing would be a gross understatement! Never before have I heard so many longwave stations, so strongly, and for such a long a time as on this DXpedition. The conditions I observed have challenged some of my long-held beliefs about longwave propagation, and reinforced just how important one's location and antenna system are to success.

During the DXpedition, at least two longwave broadcast stations were audible at most times of the day—yes, even in broad daylight. At various times, signals would rise and fall, but some LWBC signals could be heard at virtually all times. From late afternoon through the evening, multiple broadcast stations were readable, and some were putting in S9+ signals, providing "arm-chair" copy. On one occasion, I had to lower my receiver's RF gain to avoid overload from Iceland on 189 kHz. This is in sharp contrast to the signal levels I normally see at home in Western NY. At home, I'm lucky to hear more than a carrier from LW broadcast stations, and I never hear them before nightfall.

Table 1 lists a sampling of the more interesting LW broadcast and beacon stations heard during the DXpedition. Our best beacon catch was ASN/360, Ascension Island.

Mediumwave conditions were equally impressive at our DXing site. Ken Alexander specialized in these signals and made confirmed or

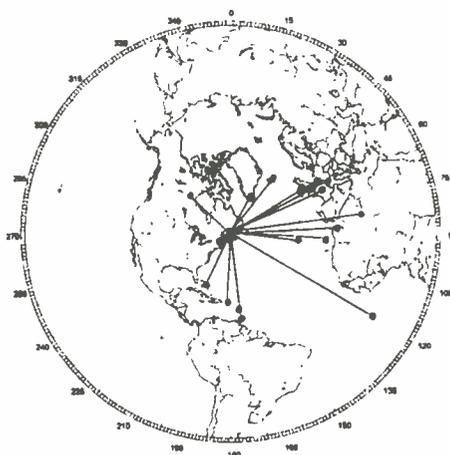


Figure 1. Great Circle map showing DXpedition site (New Brunswick) and regions heard on Longwave. (Map plot courtesy of Roger Hedin, SM3GSJ)

tentative loggings from more than 20 countries. These included stations from Saudi Arabia, Spain, Portugal, Angola, and Senegal. It was exciting to hear the zero beats of these stations between the "normal" North American frequency assignments, thus confirming their DX status. Using both Beverage antennas through a carefully adjusted phasing unit, Ken was able to bring many of these signals up to surprisingly strong levels.

One night, during a particularly good opening, we were startled by a loud knock at the door of our cabin. It was a Constable from the Royal Canadian Mounted Patrol (RCMP)! He had been called to investigate because a local resident saw "wires and cables all over the place" and thought our activities were suspicious, especially in light of the horrific events of September 11th. After we explained our purpose, there was no problem, and the officer was rather interested in what we were able to hear.

Though the visit came as a surprise, I was glad to see the authorities taking the report seriously, and I can certainly understand how a resident might become suspicious, especially because we were all "strangers" to the area. I hope that if we use the site next year, we will not arouse as much suspicion.

I did not spend my entire time at the DXpedition listening to the radio. As is the case at most of these events, there is ample time for reading, impromptu naps, and taking walks outside. We also discovered an excellent eatery nearby called the Crazy Pirate (English translation) that had the best seafood chowder we had ever tasted.

(That discovery alone is enough to bring us back for another year.)

A final note is that the solar conditions during most of the DXpedition were downright miserable. A solar flare early in the week had triggered a near-total blackout of shortwave conditions. At times, WWV was unreadable on any of their five frequencies, and only the most powerful SW broadcasters could be heard. Despite these conditions, we were able to do very well on the low and medium wave frequencies. So, even if you're primarily a shortwave DXer, consider expanding your horizons to include the low bands now and then. Hearing 19 countries during a solar storm is not bad at all. (See page 16 for related story - ed)

As we finish up another year, I want to wish all of our readers a joyous holiday season shared with family and friends. See you next month.

Table 1. LW Loggings from New Brunswick

Freq.	ID	Location
75	Time Stn.	Prangins, Switzerland
77.5	Time Stn.	Mainflingen, Germany
153	LWBC	Algeria
162	LWBC	France
171	LWBC	Morocco
175	??	Unknown on/off carrier
177	LWBC	Germany
183	LWBC	Luxembourg
183	LWBC	Germany
189	LWBC	Iceland
198	LWBC	England
204	YFY	Iqaluit/Frobay, NU*
252	LWBC	Ireland
257	FVE	Frenchville, ME
257	YR	Goose Bay, NF
265	JH	Julianehab/Qaqortoq, Grnld
270	FLO	Flores, Azores
279	SI	Simituaq, Greenland
331	FH	Frederikshab, Greenland
338	PST	Porto Santo, Madeira
359	NA	Narsarsuaq, Greenland
360	ASN	Ascension Island
369	ZDX	St. Johns, Antigua
372	OZN	Prins Christian Sound, Greenland
380	FIL	Horta, Azores
382	POS	Port of Spain, Trinidad
391	DDP	San Juan, PR
428	GC	Graciosa, Azores
526	ZLS	Stella Maris, Bahamas

* Nunavut Territory, Canada



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A consolidated frequency list allows cross-referencing by frequency, with radio signals and ("ten") codes, FCC frequency allocations tables, an excellent chapter on technical scanner topics, and even a listener's glossary.

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Picks for the Gift-Giving Season

Well, here we are entering the holiday season, a traditional time when hams often treat themselves to a little something new for the shack. I thought I'd devote some space to telling folks about the hot items they may want to see wrapped in festive bows and paper this year.

THE YAESU FT-817
PORTABLE MULTIMODE TRANSCEIVER
<http://www.yaesu.com/amateur/amateur.html>
\$950



You probably have been hiding under a rock if you missed hearing about this rig. Yaesu sensed the growing market for low power, portable rigs and they came up with a lightweight (2-1/2 pound) transceiver measuring a mere 5.3"x 1.5" x 6.5". They pushed the envelope even further, making the rig capable of HF (10 to 160 meters), 50 MHz (6 meters), 144 MHz (2 meters) and 450 MHz (70 centimeters) operation. The rig also sports general coverage HF, VHF and UHF receive as well. The FT-817 operates in all common modes as well as packet and PSK-31.

As they say, "But wait... There's more." Throw in over 200 memories, multiple antenna ports, internal/external power and Collins mechanical filters (optional) and you truly have everything but the kitchen sink. In addition to being an exciting unit on its technical specifications alone, I'm enjoying how this radio is introducing so many people to the joys and challenges of QRP operation. It has spawned a cult following of users and, more importantly, a bevy of aftermarket products unlike any rig I've seen in many years. Big things do come in small packages. I just wish one of those packages showed up under Good Old Uncle Skip's Christmas tree!

TEN TEC JUPITER TRANSCEIVER
<http://www.tentec.com>
\$1189



Well, since we're dreaming we may as well go all the way. Ten Tec was one of the ground-breaking companies in the area of computer/transceiver interfacing. They changed the way many people played radio with their Pegasus "black box" transceiver. Actually, the Pegasus is in a putty-colored box like a PC, but that's a stickler's point. Anyway, as much fun and as full of features as the Pegasus was, many folks longed for a design that incorporated all of the advanced features of the Pegasus with a more traditional front control panel set up.

Ten Tec answered their customers with the Jupiter – a rig with all the front panel controls and capabilities of any top-rated transceiver from overseas. But, not to be just one of the pack, they threw in a few additional features. This rig's signal processing capabilities are truly world class. It has Digital Signal Processing (DSP) at the IF stage with 34 receive filters covering 300 through 8000 Hz available at the touch of a control. There are also 18 transmit bandwidth filters covering 900 through 3900 Hz to give superior signal processing on SSB. There is also further audio DSP filtering and an automatic notch filter.

The receiver is General Coverage from 100 kHz through 30 MHz. Transmit coverage is all amateur legal frequencies 10 meters through 160 meters. Power level is adjustable from 5 through 100 watts. Available modes are LSB, USB, CW, RTTY (AFSK), FM, and AM. All the action is managed by way of a large format LCD graphics display that even includes a sweep display of current band activity. And if you still long for "black box" operation, the rig can be operated and controlled via computer. Some folks may dream of sugar plums but I'm dreaming of a Jupiter.



THE MORSE EXPRESS CHRISTMAS KEY
<http://www.morsex.com/xmas/>
\$49.95

This is too cute! In celebration of the holiday season, Marshall Emm, N1FN, the proprietor of Morse Express has commissioned a special telegraph key which will double nicely as a Christmas Tree ornament.

The Morse Express *Christmas Key* is a fully operational miniature key, hand machined from solid brass and plated in gold. It measures a tiny 1-3/4" by 15/16" at the base and weighs a mere 2 oz. The key is built by European key maker Llaves Graphicas Artisanas. All the usual adjustments (trunnion bearing tension, lever spring tension, and contact spacing) are available by means of gold-plated screws and matching lock nuts, and the indented knob is very comfortable in use. All of the machining and assembly processes were done by hand. The base of each key is engraved with the Morse Express "Speedy Key" logo and "Christmas 2001." This is a Limited Edition run of 200 keys, and each bears an engraved serial number on the base. Here is a gift that may show up under the tree, but then can be hung on the tree.

THE KFL1-4 FOUR-BAND MODULE FOR THE ELECRRAFT K-1 TRANSCEIVER
<http://www.elecraft.com>
\$129

Through most of my adult life I have made a point of giving myself at least one gift. I can assure you that this is it this year. And after everyone else in Uncle Skip's house has settled down for their afternoon nap Christmas Day, I will be down in my workshop melting solder on a KFL1-4 board for my K1.

You have already heard me sing the praises of Elecraft's line of transceiver kits. I

own both the K2 and the K1. The K1 was originally designed as sort of a *baby brother* to the K2. It was a 2-band CW rig small enough to take backpacking or on business trips.

The operative word in that last sentence is *WAS*. Elecraft wizards Eric Swartz WA6HHQ and Wayne Burdick N6KR have figured out a way to squeeze two more bands into the K1's diminutive form factor (a mere 2.2"H x 5.5"W x 5.7"D) without sacrificing any of its options or its operability. The 4-band module covers several of the most popular HF bands. 40 and 20 meters provide activity day and night, and are important for contests, Field Day, and QRP events. 30 meters has a small but active CW segment, and as a WARC band provides a "haven" from contests. The 4th band can be either 15 or 17 meters. 15 meters is a traditional low-noise, daylight DX band, and is very active during Field Day. 17 meters is another contest-free zone, and stays open a bit longer than 15 meters.

It only takes a couple of minutes to swap in an original 2-band module. This will accommodate those who want 80 meter coverage or specific 2-band combinations. The 4-band option for existing K1s (KFL1-4) is \$129. But if you have yet to experience the fun of portable QRP operation or great kit building, the 4-band K1 transceiver (K1-4) is priced at \$349. I can hardly wait for Santa!

THE HEIL SOUND, INC. HM-10 DUAL MICROPHONE

<http://www.heilsound.com/HM-10.htm>
\$115

It's funny...most of the time when I visit another ham's shack, I find that the transceivers are equipped with either the microphone that came with the rig from the manufacturer or whatever the ham had lying around the shack from previous systems. Few people realize how much their signal can be improved with the addition of a high quality mike that has been maximized for amateur radio use.



Well, Bob Heil K9EID took his years of audio engineering experience and applied them to the problem of poor transmit signal quality. I feel the HM-10 series of microphones are ideal for most ham applications. I'm especially partial to the Dual model. This unit contains both the HC-5 mike element for all-around ragchewing and the HC-4 element designed for cutting through the QRM when chasing DX or contesting. You may just want to leave copies of the Heil Sound catalog lying around for your significant other to see. Hints are always helpful in the season of gift giving.

THE AOR TDF-370 DSP MULTI-MEDIA TERMINAL

<http://www.aorus.com>
\$329.95

When I first saw this unit I must confess to scratching my head a bit. At first glance it was hard to decide what it was for. This is truly a case where first impressions should not be lasting ones. I think it is the name that gets people a bit confused. Yes, this desktop accessory is capable of directly decoding and displaying RTTY and PSK-31 signals. Well, fine...any computer with a sound card can do that. As they say... so what have you done for me lately?



I think the unit should have been named the Audio Filtering Machine. You see, the TDF-370 really shines as a DSP noise reduction and bandpass filter. Its internal Hitachi SH7034 microprocessor utilizes Fast Fourier Transform and Least Mean Square signal processing algorithms. The unit also has an *Auto Notch* tracking filter and stereo signal simulation for improved listening.

Another interesting feature is the built-in digital audio recorder, capable of holding 102 seconds of memory that can be divided among 8 memory positions. This could be a neat tool during contesting, especially when working CW ops whose speed exceeds your ears ability to copy. You can grab the guy's call and then play it back to yourself a few times to be sure you've got it right. Yet another exciting feature is a built-in 8 band graphic equalizer for your microphone.

You say you still want more? How about SSTV receive capability? Oh and there's that PSK-31 and RTTY I mentioned earlier too. All in a single, attractive, desktop device. Just the thing to warm a ham's heart on a cold winter's night.

Well, there you have Uncle Skip's picks for this Holiday Season. Enjoy. May there be peace on earth for all people of good will in this sacred season.

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<http://www.k4ro.net/tcg.html>

Dec 2 2000 UTC - 2400 UTC QRP ARCI Holiday Spirits Sprint
<http://www.qrparci.org/>

Dec 7 2200 UTC - 1600 UTC ARRL 160-Meter Contest
<http://www.arrrl.org/contests/>

Dec 15 0000 UTC - Dec 16 UTC ARRL 10-Meter Contest
<http://www.arrrl.org/contests/>

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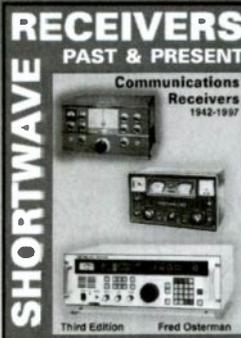
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Digging Into the Command Sets

In the introduction to our "command set" project (see the October issue), I presented some basic information about finding and identifying these radios and announced that we'd be working on both Army and Navy versions (BC-453 and R-23A, respectively) of the 190-550 kHz navigation receiver. I'm including a schematic of the BC-453 with this article. You'll notice that, unlike the Philco and National radios we've already restored, the command set has an r.f. amplifier tube ahead of the converter stage as well as an extra i.f. amplifier. We can expect it to be quite sensitive compared to the ones we have been working on.

In preparation for this installment, I removed the cover plates from the two sets and began studying the radios and their circuit diagrams. The first thing I noted was that, though the two were physically and electrically almost identical, there was a difference in the tube complement.

◆ Clearing Up Some Confusion

In the R-23A, a 12SF7 was substituted for the 12SK7 second i.f. amplifier tube found in the BC-453. Doing some research, I found the reason. The BC-453 and its sister radios in the series are not equipped with AVC (automatic volume control); the R-23A and its sisters are so equipped. In addition to being an amplifier

tube, the 12SF7 contains a set of diode plates that is used to rectify signal voltage to provide AVC action. Incidentally, you may find some sets containing 12SG7 tubes. These were apparently never original equipment; some hams swapped them for the original 12SK7s to obtain "hotter" operation.

In the October article, I mentioned that I also own a somewhat rare Navy "marine frequency" set covering 1.5-3 MHz. I assumed it was an R-25, though the only ID it carried was "CCT-46104." Recently, I got that radio out and found that it used a 12SK7 rather than the 12SF7 in the second i.f. position. No AVC! Hitting the books again, I discovered that, in addition to the "ARC-5" series (which includes the R-prefixed receivers), the Navy had used another series of command receivers designated "ARA." These apparently are identical to the Army's "SCR274-N" series. And so I need to expand the nomenclature list I published in October. Here it is, complete:

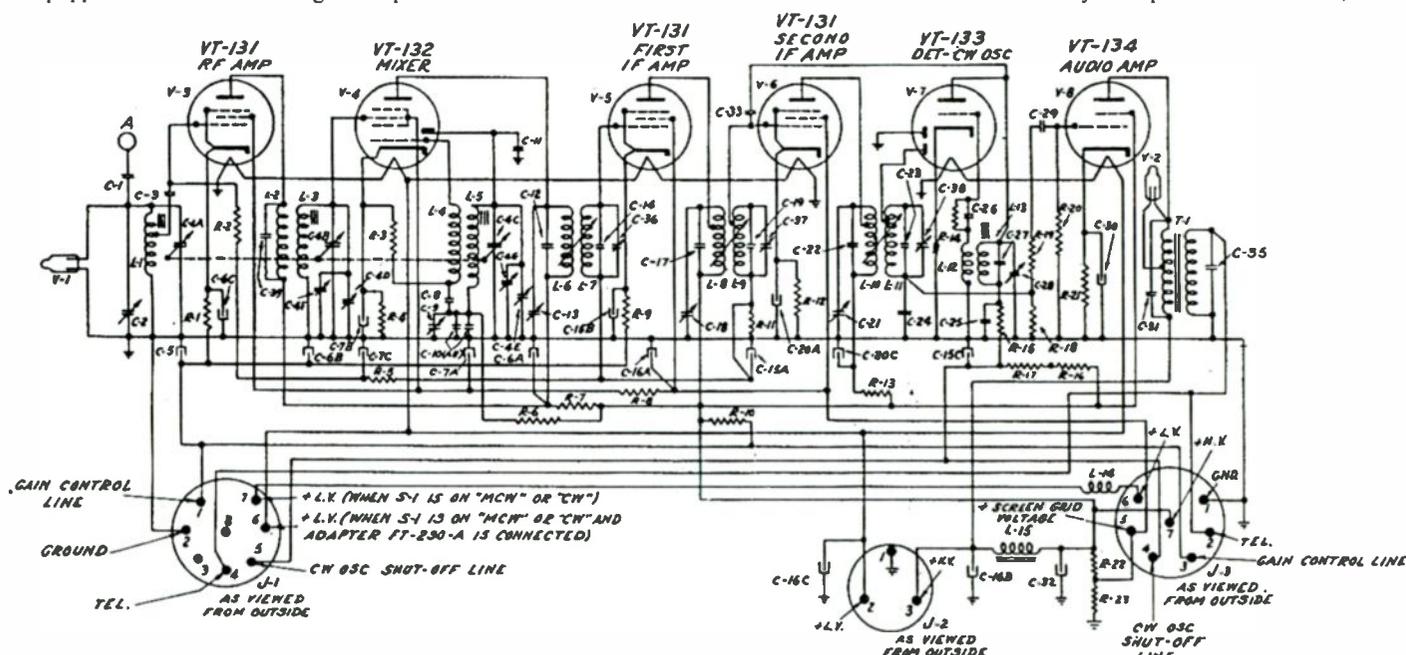
	SCR274-N	ARC-5	ARA
190-550 kHz	BC-453	R-23, R-23A	46129
520-1500 kHz	BC-946	R-24	46145
1.5-3 MHz	---	R-25	46104
3-6 MHz	BC-454	R-26	46105
6-9.1 MHz	BC-455	R-27	46106

The three letters (CCT) preceding the number 46104 on my set designate the set's manufacturer, in this case Stromberg-Carlson. The number indicates the set model, regardless of manufacturer. Since the letters will vary from set to set, I haven't included any on my chart. If any reader can throw additional light on the command set models and numbering system, I invite him or her to get in touch with me.

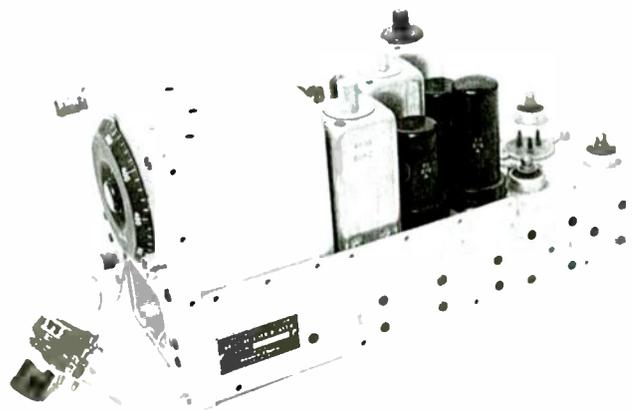
◆ Beginning the Restoration

The first thing I did was to remove the chassis bottom plate of each set, as well as the wrap-around enclosure surrounding the tubes and other components mounted above the chassis. The view under the chassis was a little daunting at first because of the tightly packed wiring resulting from the extremely compact physical design. However, after a little study, I got used to the construction style and felt a little more comfortable about evaluating the condition of the radios.

The BC-453 seemed to be all but untouched; the R-23A showed some signs of modification by a knowledgeable hand. The latter had pencil-marked notes made during disassembly and reassembly, and I could see that some rewiring had been done. The purpose of it seemed to be to provide an adjustable BFO pitch control on the front panel (the BFO is normally controlled by a simple "On-off" switch). There



Schematic of the BC-453. The tubes are shown with military ("VT") designations. From left to right, civilian type numbers are: 12SK7, 12K8, 12SK7, 12SK7, 12SR7, 12A6.



BC-453 with top enclosure removed. Front adapter plate has also been removed for inspection of wiring.

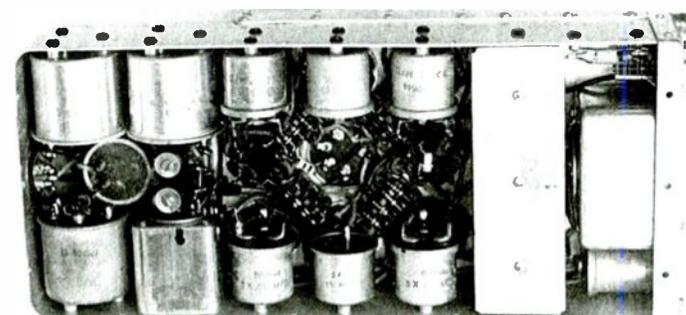
was also a gain control and a d.p.d.t. switch with a center "off" position, apparently installed to control BFO action.

Probably to make room for the extra parts, the internal enclosure containing the plug for the local control adapter had been removed – and all control connections were made directly into the set instead of to that plug. That makes the conversion work a little more difficult to trace. In the BC-453, the enclosure and plug were in place and control wires were soldered to the plug. There was only a gain control and a single wire brought out through a small hole in the panel – apparently intended to be grounded and ungrounded manually to control the BFO. However, neither of these control functions could have worked, since the connections to the plug were not only incorrect, but made no sense at all!

As originally supplied, the six 12-volt tubes in these sets were wired in series/parallel for operation from the plane's 24-volt d.c. system. The tubes were divided into three pairs of two, with each pair wired in series to operate from 24 volts. The three series-connected pairs were then wired in parallel and connected to the radio's low-voltage input wiring.

Since 24-volt transformers were not a common item during the era when hams were converting these receivers for plug-in operation, many of the sets were rewired to put all the heaters in parallel. Then the set would operate from 12 volts, or even from six volts if six-volt equivalent tubes were substituted for the 12-volt types. You may well come across a set with substituted 6-volt tubes at a radio flea market or swap meet.

I found it easier to check for this conversion with an ohmmeter rather than tracing the circuitry.



Looking at the bottom of the BC-453 with cover plate removed. The set's capacitors are contained in the array of round cans.

In the original wiring, the front pair, middle pair, and back pair of tubes – looking at the set from front to back – are each connected in series. I simply took all of the tubes out and connected an ohmmeter across the low-voltage input terminals. Then I replaced the pairs, one at a time, to make sure that resistance indicated on the meter decreased only when the second tube of a pair was plugged in. The tests confirmed that both radios had their original 24-volt wiring.

◆ Next Steps

Just as with almost any radio restoration worth doing, the job will start with a complete recapping. Although the capacitors in these receivers are in sealed cans and look quite permanent, they are known to be failure-prone. I'll order a complete new set of caps for both radios in time for next month's work session. In the works as well is the design of an a.c. power supply that, hopefully, can be constructed from common Radio Shack parts. I'll also be rewiring both control panels in a more convenient configuration. With luck I hope to find room for a 1/4" headset jack on each one, in addition to the BFO and gain controls. (These radios are intended to deliver headset volume only – though there are ways to get speaker output if really desired.)

In the meantime, if you'd like more information about the subjects of this restoration, you might visit the following web site for command set lovers: <http://www.arc5.com/duck/index.html>. Follow some of the links given there for pictures and schematics of many of the models. Another good source of documentation for command set equipment is Fair Radio Sales, 1016 E. Eureka St., Lima, Ohio 45802. Phone 419-223-2196 or 419-227-6573. e-mail fairradio@fairradio.com.

◆ Reader e-Mail

Larry Bonay says he's been bitten by the restoration bug and is currently working on a Zenith table model. Larry asked for recommendations on a good radio restoration book. Although I made some suggestions, I think I'll defer any public answers until I'm ready to devote a whole column to discussing such resources.

Dave Satkowski, on the other hand, writes to recommend some books he picked up at a hamfest and found to be useful and practical. They are *Elements of Radio* by Abraham and William Marcus, third edition, 1953 and *Elements of Radio Servicing* by Marcus and Levy. Dave has also purchased many old and

out-of-print radio servicing books through <http://www.bookfinder.com>. Let them know the title you want and they'll try to locate a dealer who has it.

Frank Hammonds tells me that he enjoys the column a lot and that he decided to purchase a National SW-54 on e-bay after reading the SW-54 restoration on these pages. He finds its simplicity an interesting contrast to the Radio Shack DX-398 he usually listens with. But in spite of its limitations, the little set brought in stations from all over the world – including Greece, which was a first for Frank. He found the sound quality, so different from what we enjoy now, to be quite interesting also. He enjoys listening to old-time radio broadcasts on it. If you have an SW-54 or are considering acquiring one, Frank says you can download a manual from <http://bama.sbc.edu/national.htm>.

Our editor recently forwarded a message posted on several SWL lists by Marie Lamb. She suggests checking out the new international short-wave listings on the Hallicrafters Collectors International web site <http://www.w9wze.org>. HCI offers lots of material for SWLs and hams, especially those who are fond of Hallicrafters radios and other sets from the tube era.

I enjoy getting e-mail from readers of this column – and am always interested in learning what you like and dislike about it. Right now, the emphasis is on communications receivers rather than home sets because of an obvious assumption I made about the interests of "MT" readers. Am I right? Let me know what kind of sets, communication or broadcast, that you'd like to see covered!

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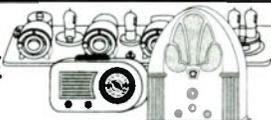
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Antennas Near, or Under the Earth's Surface

Although the "Old Timers Rule" tells us that antennas should be mounted as high and in the clear as practical, we sometimes actually benefit from breaking that rule. There are many reports of success using antennas mounted near to, or directly on the surface of the ground. Subsurface (underground or underwater) antennas have also been successfully utilized for both transmitting and receiving. We'll refer to these low-mounted antennas and subsurface antennas collectively as "LMSS" antennas. Generally LMSS antennas are used for HF or lower frequencies. The lower the frequency the better these antennas perform. Nevertheless, subsurface antennas have been successfully utilized for communications at frequencies as high as the VHF band.

Easy to put in place, low in cost, NVIS performance ("near vertical incidence skywave," providing coverage up to a few hundred miles, even in mountainous terrain), and low levels of received noise (including power-line noise), are characteristics of LMSS antennas. These antennas also have the benefit of lower susceptibility to lightning-induced damage, excellent wind and weather resistance, and an essentially zero visual impact.

The distance covered by most emergency communications is well within the capabilities of NVIS. This fact, coupled with the ease and speed of putting LMSS antennas in place, and the reliability of NVIS paths for short-haul communications, recommends the inclusion of LMSS antennas in emergency-preparedness communication plans.

◆ Gain vs Signal-to-Noise Ratio:

LMSS antennas can and do support reliable communications on HF nets, and for general communication. But keep in mind that LMSS antennas typically deliver significantly less received or transmitted signal strength (i.e., have much less gain) than "up in the air" (UITA) antennas. You will miss many DX and weak-signals with LMSS antennas compared to UITA antennas. But for many signals low gain is acceptable. And when a low-gain design is such that received noise is reduced to a greater extent than the received-signal strength, then signal-to-noise ratio (S/N) is improved. Improving S/N improves the quality and readability of signals.

The excellent performance of two well-known and very-low-gain antennas – table-top loops and the Beverage antenna – is based on their excellent S/N. With the Beverage, a sharp beam pattern rejects off-beam noise and interference, whereas table-top loops have nulls (directions of very-low response) which can be oriented to reject noise and interference. In both cases the antenna improves S/N over nondirectional antennas. Note also that both these antennas are usually operated relatively near the earth. LMSS antennas reject received noise by virtue of being under, on, or near the earth. If they are directional, so much the better: their lobes and nulls can be used to improve the S/N even more.

◆ Building LMSS Antennas:

One of the simplest LMSS antennas is a random-length longwire (fig. 1A). Here a wire as long as practical is buried, or laid out on top of the earth. Run it in a straight line pointing at, or directly away from the station to be received. If run in a crooked path it will be less directional.

The snake, a receiving antenna, is laid on the ground. For ham bands use 125 ft of any kind of coaxial cable with the inner and outer conductors shorted at the end farthest from the receiver. Doug DeMaw, W1FB, found that a 51-ohm resistor, rather than the short, gave better reception. Avoid multiples of a half wavelength with this antenna. Some versions connect only the center coax-conductor to the receiver, and leave the outer conductor unconnected.

A full-wavelength loop makes a nondirectional antenna. It can be spread on the ground, or buried in any shape. Connect one side of the loop to the center conductor of the coax feedline, and the other side to the outer conductor.

Another simple LMSS antenna is a center-fed, halfwave dipole (fig. 1B).

◆ Some Details:

One critical difference between UITA antennas and LMSS antennas is that air surrounding an antenna affects the velocity of wave travel differently than does earth or water. For this reason, element length and (for multi-element designs) the spacing between elements, is less for LMSS antennas than for the same design in air. These dimensions also vary with type of soil, soil dampness, and depth of burial. As a first-approximation, try the formulas below to get lengths and spacings for your LMSS antennas. Losses due to proximity to the earth cause the antennas to be broad-banded, but they still usually do show a resonance point.

For half wavelength buried elements:
Length (feet) = 312/Frequency(MHz)
Length (meters) = 95/Frequency (MHz)

For halfwave elements laid on the ground:
Length (feet) = 324/Frequency (MHz)
Length (meters) = 99/Frequency (MHz)

For LMSS antennas an antenna tuner and/or a low-noise preamplifier may help reception. An antenna tuner will almost certainly be essential if the antenna is used for transmission.

Effective burial depths have been reported to vary from a couple of inches to a few feet. Generally the closer to the surface the less signal

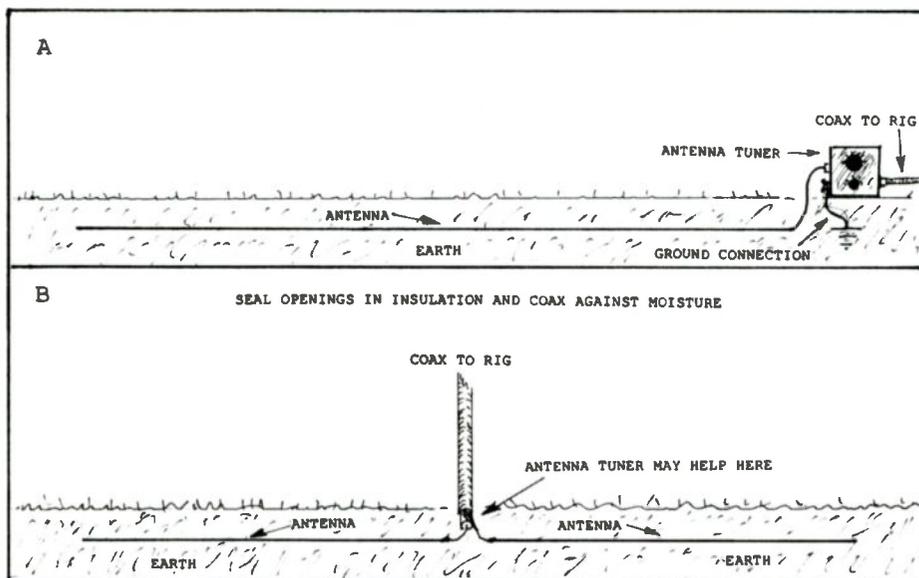


Fig. 1. An underground, or on-ground long wire antenna (A), and an underground, or on-ground halfwave-dipole antenna (B).

This Month's Interesting Antenna-Related Web site:

And a Note on the Antenna Contest:

There was more weirdness in the Weird and Unusual Antenna Contest than I had planned! R. A. McPhee writes to say that the fractal antenna shown was actually a standard fractal antenna, rather than the his ice-crystal fractal antenna.

Both Todd Roberts, WD4NGG, and Scott Davis, K5TA, sent information which suggest that the "Russian" antenna shown in the contest report's fig. 1C looks suspiciously like the crossed-field antenna. The reports on the crossed-field antenna sound remarkable, almost unbelievable. You can check them out on web sites offered by Scott:

<http://www.luminet.net/~wenonh/cfo/>
and Todd:

<http://www.longwaveradio.com/engineering.html>.

loss. If made of bare wire these antennas will short into damp earth. Therefore, use wire insulated with waterproof insulation and seal any opening in the insulation with some sealer like coaxial-cable sealer. Some writers have suggested putting the wires inside PVC tubes sealed to keep moisture out. On-the-ground antennas will work when covered with snow, or during rain, but their electrical length will vary with these changing conditions. Thus if an antenna tuner is used it may need adjustment when rain or snow is present. Interestingly, some reports say that the antennas work best when the ground is wet.

And So:

LMSS antennas are not competitive with UITA antennas for general use. On the other hand, as discussed above, they do have certain features that can be useful in specific situations.

RADIO RIDDLES

Last Month:

I said: "What was the simplest radio receiver ever built? You might think until your brain Hertz, and still not know this one."

Well, my candidate for the simplest receiver ever is a loop of wire with a break (a spark-gap) in it. That's right, just a metal ring with a small gap! This is the receiver which Heinrich Hertz used as he explored the new discovery of electromagnetic (radio) waves.

That's right, the small ring or resonant loop was the antenna. The spark gap was both the detector, and visual transducer. It produced sparks when a signal was received, and this allowed Hertz to see, rather than hear, that reception had occurred. The distance between his spark-gap transmitter and spark-gap receiver was only a few yards, but his transmitter produced relatively little power at the ring's resonant frequency. Therefore, the sparks at the receiver were sometimes so tiny that he used a magnifying glass to see them!

This Month:

In discussions of the grounded, quarterwave, vertical antenna, mention is sometimes made of a mirror image of the antenna. In technical discussions of this antenna we sometimes see this drawn as an image of the actual antenna, and positioned upside down in the earth directly below the actual antenna. This image is used to explain how the radiated waves interact with the ground to shape the antenna's vertical-radiation pattern. Does this image act as an underground antenna, and transmit underground?

You'll find an answer for this month's riddle, another interesting, antenna-related web site, and much more, in next month's issue of **Monitoring Times**. 'Til then Peace, DX, and 73.

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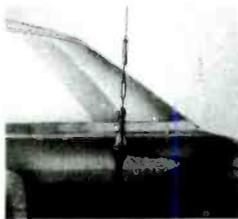
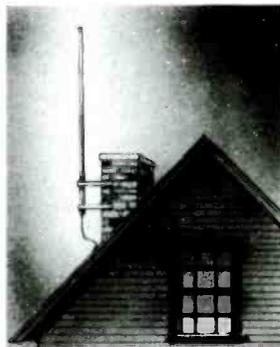
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Build a Mounting Bracket from Golf Balls and Scrap Wood

Mounting a monitor receiver or scanner in a car manufactured before the 1974 gasoline shortage was simple. Most cars of that era were large and dashboards were solid and predictable. The typical scanner or monitor receiver came supplied with a U-shaped bracket that bolted easily to the dashboard's bottom lip.

When gas became expensive, automobiles were redesigned. Installing a scanner became more difficult due to the lack of interior space, the use of plastic dashboards, and the prevalence of curved vs. flat surfaces. Today's sporty car interiors feature a center console located where one might otherwise mount a radio. Air bags require clearance, too. The task is even more complex in installations that must provide mounting for multiple scanners, cell phones, external speakers, laptop computers, frequency counters, and other electronic accessories.

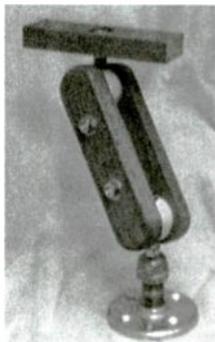


Fig 1: Finished product.

Where underdash mounting is impossible, professional installers mount radio equipment in "mid air," supported by a small mounting arm screwed or bolted to the floor or side of the center console.

You can purchase handsome, universal arm-type mounting brackets for about \$30 from companies like Panavise (<http://www.panavise.com>) and RAM (<http://www.ram-mount.com>) if you have more money than time. Being a tinkerer, I elected to build a bracket (Fig. 1) using about \$5 worth of parts instead.

I used a common 1/2" pipe flange for the bottom base. It may be attached to an auto floor or the side of a center console. The "universal joint" design permits the base to be oriented at a 90-degree angle or more from the support arms.

A horizontal block of wood at the top of the bracket supports the scanner or accessory to be mounted. You'll have to drill holes through the wood support, and the holes must line up with holes in your equipment.

Golf Ball Joints

The bracket design suits a variety of physical environments. Each end can be tilted and rotated throughout a wide range of orientations

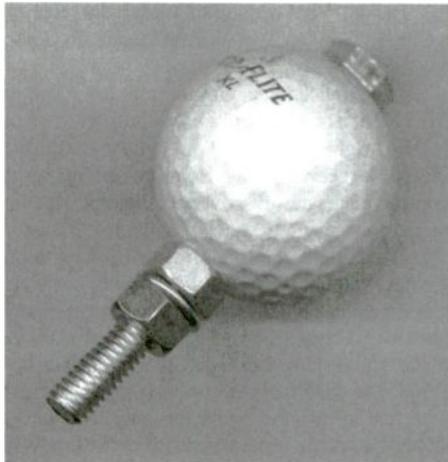


Fig 2: Golf ball with bolt, lock washer, and two nuts.

before final tightening.

A golf ball sandwiched between two wooden arms makes an inexpensive universal joint. I drilled a 5/16" hole through each golf ball (Fig 2). It's important to wear eye protection while drilling the balls because the inner material may be under high pressure.

Wooden Arms

The mounting bracket arms are built of wood (Fig. 3). It's important to use a hardwood like maple, birch, hickory, oak, or walnut, which won't deform when tightening the bolts during final alignment.

I constructed the arms from scrap walnut stock salvaged from a shipping crate. Shipping pallets and crates can be good sources of scrap wood, though you must take care to remove all nails and staples first to avoid damaging saw blades.

The arms are 7 inches long, though you can use a different length to suit your application. I bored a 1-1/4" flat bottom hole, 3/8" deep, at each end on the inside of each arm. The holes serve as sockets for the golf balls and prevent them from popping out.

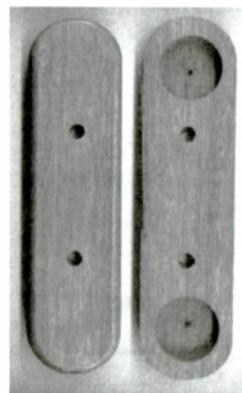


Figure 3: Hardwood arms, outside view on left, inside view on right.

The ends of each arm are rounded to provide clearance when positioning the bracket. I used a router fitted with a round over bit to knock off the edge on the outside of the arms. Rounding over the edge improves appearance, but isn't necessary.

The Base

The base is constructed of a 1/2" pipe flange, nipple, and end cap (Fig. 4). These parts are easy to find in your local home center or hardware store and the total price should be in the \$2.50 to \$5.00 range if you buy a galvanized flange. You can save a dollar or so by opting for an unfinished flange with a dull finish.

Drill a 5/16" hole through the center of the end cap.

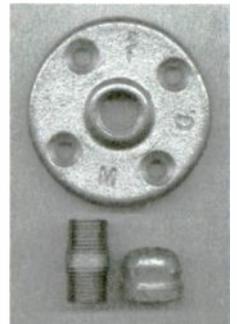


Figure 4: 1/2" pipe flange, nipple, and end cap.

Finishing and Assembly

You should paint or coat the wooden parts with polyurethane or other finish to seal them against moisture.

Assembling the mount is easy. Sandwich the golf balls between the two wooden arms (Fig. 6) using the flat bottom holes as ball sockets. The arms are held tightly together using two bolts, two flat washers, and two nuts.

Assemble part of the base by screwing the nipple into the pipe flange. Slide the end cap over the bolt protruding from one the lower golf ball and fasten using a nut. There's no room inside the end cap to fit a lock washer, but you shouldn't need one if you tighten the nuts well enough.

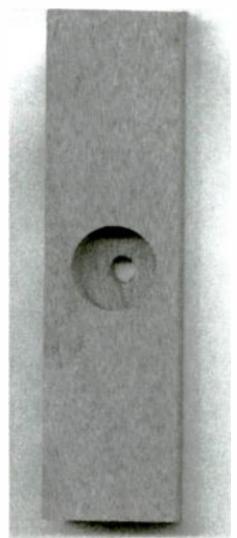
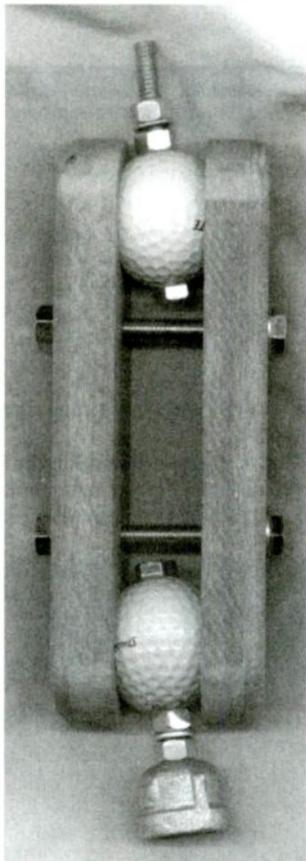


Figure 5: Top piece supports the radio.



Fasten the horizontal wooden support block to the upper golf ball using a washer and nut. Make sure the flat bottom hole faces upwards as shown in Fig. 1. The recessed nut won't interfere with your scanner.

Installation and Final Adjustment

Before installing the mount in your car, make sure it won't interfere with the steering wheel, air bag, shift lever, etc. Install the mount by screwing or bolting the pipe flange to a flat surface. Fasten your equipment to the horizontal support block. Adjust the wooden arms to hold your equipment in the desired position, then tighten all the nuts to prevent the bracket from moving.

PARTS LIST	
hard wood, 1-7/8" x 3/4" x 7" or longer (qty 2)	
hard wood, 1-7/8" x 3/4" x 6" (qty 1)	
golf ball (qty 2)	
pipe flange, 1/2" (qty 1)	
pipe cap, 1/2" (qty 1)	
pipe nipple, 1/2" (qty 1)	
5/16" x 3" hex bolt (qty 4)	
5/16" flat washer (qty 4)	
5/16" lock washer (qty 3)	
5/16" nut (qty 8)	

Figure 6. Partially assembled bracket showing golf balls sandwiched between wooden arms.

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DJ-X2000T

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AR8200MK2B
AR8600

SANGEAN
ATS-909
ATS-505P
ATS-404

GRUNDIG
SATELLIT 800

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IC-R2
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IC-R10
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PCR-1000
PCR-100

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BC-895XLT
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SC200

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Dep't Store Freqs from page 20

151.8050	PL 77.0	Operations
151.9550	PL 74.4	Operations
154.6000	PL 85.4	Operations

Pottery Barn
Common frequencies 154.5700 and 464.5500
Common PL tones 67.0 and 179.9
Confirmed frequencies and tones:

151.6250	PL 67.0	Operations
151.7600	PL 67.0	Operations
151.9550	PL 67.0	Operations
154.5700	PL 179.9	Operations
154.6000	PL 67.0	Operations
154.6000	PL 179.9	Operations
464.5500	PL 67.0	Operations
464.5500	PL 85.4	Operations
467.7625	PL 186.2	Operations

Rasputin Music
Common frequency and tone 154.6000 PL 67.0
Confirmed frequencies and tones:
154.6000 PL 67.0 Operations

Robinsons-May
Confirmed frequencies and tones:
463.7250/468.7250 DPL 365 Security
464.8125/469.8125 DPL 351 Security

Sears
Common frequencies 151.8350, 151.8950, 461.1625 and 461.1875
Common PL tones 77.0 for VHF and 151.4 for UHF
Confirmed frequencies and tones:
151.8350 PL 77.0 Maintenance (MD & PA only)
151.8950 PL 77.0 Security (MD & PA only)

461.1625	PL 118.8	Security (CA only)
461.1625	PL 151.4	Security (CA only)
461.1875	PL 118.8	Security (CA only)
461.1875	PL 151.4	Security (CA only)
464.3250/469.3250		PL 103.5 Security (HI only)
464.7250	PL 151.4	Security (CA only)
466.1125	DPL 271	Security (San Jose only)
467.9000	PL 67.0	Stock Room
467.9000	PL 151.4	Stock Room
467.9250	PL 151.4	Stock Room
469.8125	DPL 271	Security (San Jose only)

Structure
Frequencies to search
http://commerce.moto'ola.com/consumer/QWhtml/spirit_frequency.html
Confirmed frequencies and tones:
467.7625 PL 67.0 Operations
467.7625 PL 79.7 Operations
467.8125 PL 67.0 Operations

Target
Common frequencies and tones 151.6250 PL 179.9 and 151.9550 PL 179.9
Common frequencies and tones 461.0375 DPL 026 and 466.2875 DPL 032
Confirmed frequencies and tones:
151.6250 PL 123.0 Ch. 1 Operations
151.6250 PL 179.9 Ch. 1 Operations
151.9250 DPL 506 Security
151.9550 PL 82.5 Ch. 2 Loading Dock
151.9550 PL 179.9 Ch. 2 Loading Dock
461.0375 DPL 026 Ch. 1 Operations & Paging
466.2875 DPL 032 Ch. 2 Operations
469.4875 DPL 047 Ch. 3 Security
462.9125 DPL 065 Ch. 4 Security

Toys R Us
Common frequencies 151.6250, 151.9550 and 154.6000

Common PL tone 94.8
Confirmed frequencies and tones:

151.6250	PL 94.8	Operations
151.9550	PL 94.8	Operations
154.6000	PL 77.0	Operations
154.6000	PL 94.8	Operations
154.6000	PL 136.5	Operations

Telephone & Paging System:
30.8400/154.5700 457.5375/469.6625
33.1600/154.5150 457.5875/468.7625

Walmart
Common frequencies 154.5700 and 154.6000
Confirmed frequencies:
154.5700 NONE Operations
154.6000 NONE Operations
464.5000 PL 179.9 Operations

Warner Bros Studio Store
Common frequencies and tones 154.5150 DPL 114 and 154.6000 DPL 114
Confirmed frequencies:
154.5150 DPL 114 Operations
154.6000 DPL 114 Operations

Williams-Sonoma
Confirmed frequencies:
151.6250 PL 67.0 Operations
151.7600 PL 173.8 Operations
151.9550 PL 156.7 Operations
151.9550 PL 192.8 Operations
154.5700 PL 67.0 Operations
154.5700 PL 167.9 Operations
464.5500 PL 67.0 Operations
467.8125 PL 67.0 Operations
467.9250 PL 186.2 Operations

Software for the BC 780XLT - II

Last time we looked at two computer control programs for Uniden's BC 780 XLT "do everything" receiver. Both WinScan780 and TrunkStar780 programs proved to be up to the task of allowing simple, yet total, control of the 780 with a PC. This time we will look at two other programs which also provide computer control of the 780. In fact, this time it is somewhat of a comparison between the veteran and the new kid.

◆ The Veteran – ScanCat

From almost the first *Computers & Radio* column ScanCat has been around. Not the first, but one of the first that are still in business, ScanCat is now up to ScanCat-Gold version 8.0.2! The aggressive philosophy of the ScanCat developers has always been to push the envelope. This admirable approach sometimes found itself ahead of the then-current computer hardware capabilities. The result was a "do-everything" "for all-radios" program that performed sluggishly, due to its heavy demands on the PC and was an operational challenge for many users. But things have changed.

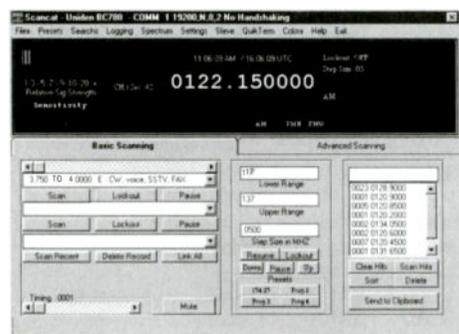


Figure 1: ScanCat 8 Basic Scanning – as simple as it gets!

◆ Today's PC Situation

All you have to do is look at an ad from Best Buys, Fry's or Staples in the Sunday newspaper and see what has happened to home PC prices. These days, for less than \$500, you can own a 600 MHz Celeron, with 32 MEG of RAM and a 20G hard drive! I have even seen Hewlett Packard machines down near these prices. Today's PC has come a long way in its speed and capabilities from just a few years ago. Although the input/output port speeds have changed little since the advent of USB, the system speeds have seen increases of five times,

almost ten if you go to a high end 1000 MHz Pentium.

The speed of development in the home computer world has been breath-taking and, in some cases, company-taking. Not all of the PC companies had the financial stamina to withstand the crazy development cycle, which obsoletes product in a matter of months, not years. The result for the consumer, however, has been better and better performing PC for less and less money.

◆ Today's ScanCat 8

According to ScanCat 8's 140-page manual, its minimum PC system requirements are an IBM/PC compatible, Windows 95/98/ME, 32 MEG Ram, 10 MEG free hard drive space and a free serial port. (MAC users can also use ScanCat; see their website at <http://www.scancat.com> for details). Since the program comes on a CD ROM, they should have also added a CD ROM drive as a requirement. We used a Pentium II, 300 MHz laptop with 64 Meg of RAM for our try-out. Connection between the PC's serial port and the 780 is via a standard serial cable.

◆ A Changed Cat

Installation was quick and easy. One recommendation is that after you load the program you do a cold boot to your computer. The cold boot will clean away any previously-run programs, which may have become "possessive" of your serial port, interfering with ScanCat's control of your receiver. This is probably a good idea after shutting down ScanCat if possible.

It appears that I was not the only one who thought that all of ScanCat's options and controls could be intimidating. ScanCat now has an entirely new face. Figure 1 shows ScanCat in the Conventional Scanning Mode, with the Basic Scanning option selected. It is controlling the 780 and searching the civil aircraft frequencies, 117 to 137 MHz. This can be seen in the center rectangle under the large frequency display. The area to the right shows active frequencies discovered during the search. Clicking "Scan Hits" allows the user to scan just those frequencies found in the search; a very nice feature.

The screen is simple and uncomplicated, just what many of us want after a day at the office. Of course, the drop down menus at the top of the screen control more advanced functions such as logging variations and spectrum display of search results. But the point here is

that if the user just wants simple scanning, the Basic Mode is perfect.

A nice new feature is that clicking can control the information displayed in the large, dark frequency display area. For the example, left

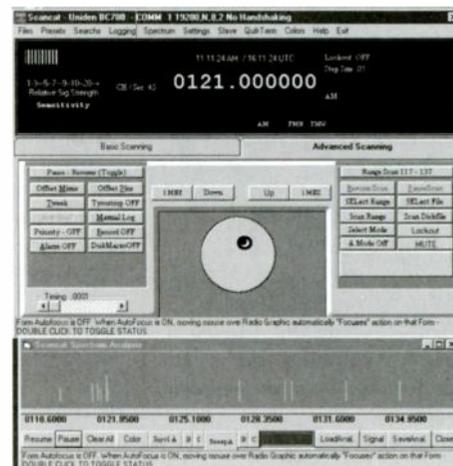


Figure 2: ScanCat 8 Advanced Scanning Screen

clicking on "Sensitivity" on the left, increases the sensitivity. Right clicks reduce the sensitivity. Similarly, clicking on the large frequency numbers allows the user to type in a new frequency from the keyboard.

For those of us that want the ability to really dig into the computer-scanner relationship, that intimate experience is only a click away. Clicking the area under the large display labeled "Advanced Scanning" transforms ScanCat into Figure 2. The presence of a tuning knob is the most obvious physical change to the screen. However, many of the features previously hidden in the pulldown menus are available as single click function buttons, such as those commands related to files and logging. The Spectrum display at the bottom of the Figure 2 indicates active frequencies and has many other useful functions. It can also be displayed in the Basic Scanning mode.

◆ What About Trunking?

Till now we have been looking at the Conventional Scanning mode. If instead we choose the "Trunked Scanning," and then "Search," the result is Figure 3. A whole new world opens up to the user. The top of the screen gives basic frequency and trunk tracking info as seen on the 780XLT's LCD. However, the bottom of the screen is most interesting since it gives the user

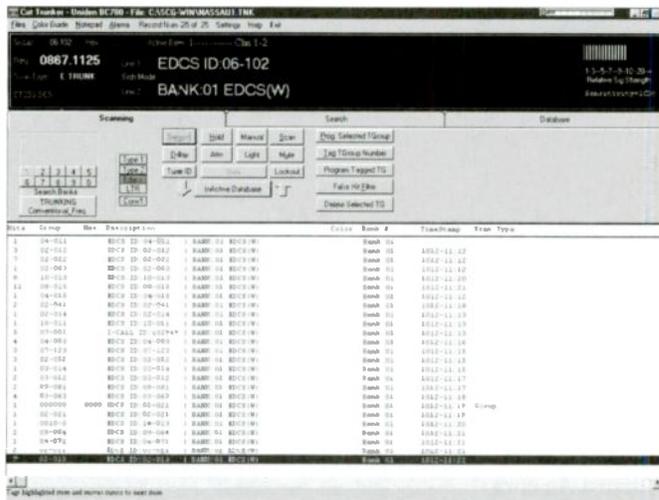


Figure 3: ScanCat Trunk Scanning Screen

a running, detailed list of trunk station information. I found this real-time record very useful in analyzing new networks.

In my opinion, ScanCat provided this data in the most useful format. To be fair, both TrunkStar780 and WinStar780 also provide this information. However, they used different presentation methods. The other programs we tried just provided info on the station being monitored at the time.

Using ScanCat 8 made using (and taming) the BC 780XLT easy and pleasurable. With its intuitive screen operations, ScanCat 8 even made trunk tracking easy and fun, with no need for lots of instructional reading. It has many more features that we have not had time to cover this time.

◆ **The New Kid - ScanPro BC780XLT**

If you have been on eBay lately and searched on "BC 780XLT," you have probably seen auctions for a BC 780XLT PC control program. Although, as we have seen, there are a number of programs that control the 780, the one I that I keep seeing on eBay is ScanProBC780XLT.

Figure 4 shows ScanPro780XLT's main

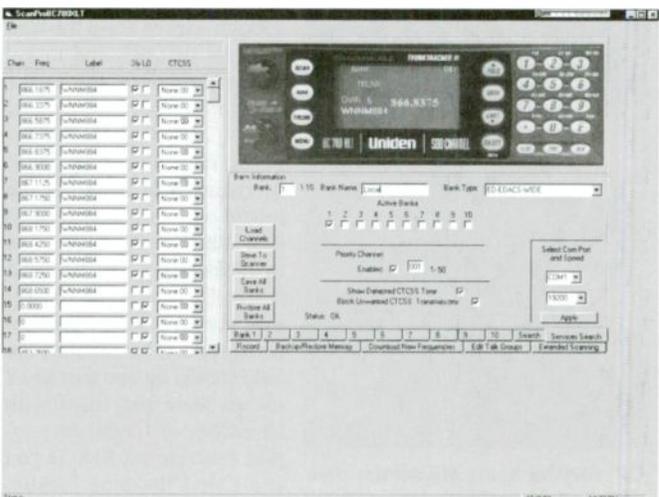


Figure 4: ScanPro780XLT's main screen.

screen. As you can see, it is a very basic program that installs easily from a CD ROM. The top right side of the screen is a photo realistic image of the BC780XLT with operational controls. This is a very nice operational approach and is reminiscent of the aircraft cockpit presentations in Microsoft's Flight Simulator 2000.

The left side of the screen gives the user an expanded list of bank channel data including frequency, user label, delay, lockout and CTCSS tones settings. I found this a simple, yet powerful, approach to displaying lots of radio settings to be useful for conventional scanning.

Uploading and downloading data between the 780 and the PC is accomplished via the four large buttons on the left side of the screen. These, in conjunction with the two lines of tabs along the bottom, provide Bank control.

Other features of ScanProBC780XLT include a voice recorder and an Extended Scanning Mode, which allows the user to scan up to 10,000 frequencies by using the PC's hard drive for data storage. These frequencies are divided into 200 Banks, each having 50 channels.

◆ **How Did New Kid Do?**

Well, for the first time out, pretty good ... with some rough spots. The photo realistic display is nice touch but doesn't always keep up with the 780XLT's operation. In the Trunk mode I found this to be the most severe, with the PC display lagging the actual frequency by more than three hits. I was somewhat surprised to discover I could get the PC displaying the actual frequency by clicking on the frequency display region of the PC. This may have something to do with an I/O bus interrupt polling that is generated by the mouse click. Also, display buttons didn't always seem to function correctly. I think the I/O and display refresh routines need some minor polishing.

For the first try and with its very low price ScanProBC780XLT should be considered. You can find out more about this product and their programs for the BC895, BC245, Pro-2052, Pro-92 and Pro-2067 at <http://www.section1.com>.

◆ **The Wrap Up**

First, let me say that this part is just my personal opinion. I'm sure that you will have your own likes and dislikes. So I suggest that you try any demo versions which may be available, be-

fore you buy. Having said that, here goes.

The power of the PC has finally caught up with ScanCat's needs! Whether you are a beginner or hardened veteran, ScanCat version 8, with its new operations screens and features is hard to beat. It controls lots of different radios, with lots of different features, using lots of different information display options that are user definable. In short, it does a lot very well. Although previous version of ScanCat had moments of temperamental PC operation, version 8 was very well behaved. One word of caution, though: Even on my Pentium II 300 MHz machine, all else slowed to a virtual stop when ScanCat was running. That included displaying typed letters in MS Word! Although not inexpensive, ScanCat 8 my first choice. See them at <http://www.scancat.com>. It is also available from Grove at <http://www.grove-ent.com>.

A very close second are both TrunkStar780 and WinStar780. They will definitely do the job for your 780XLT. And if you only want to control a BC780, they will do it at less cost. You can check them out at <http://www.scanstar.com> and <http://www.mghusa.com/pozilla>, respectively.

Naturally, since we begun this look at BC 780XLT PC control programs I have found a few more on the web. Check the software and scanner sections of <http://www.strongsignal.com> for a few more PC and some MAC 780 control programs. Till next time, here is wishing you and your family a happy holiday season.

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Mobile SWL Alternatives - III

By Ken Reitz KS4ZR

In July of this year the most venerable of all international shortwave broadcasters, the BBC, announced it would no longer make its World Service transmissions available directly to North America (as well as Australia and New Zealand). It did so, citing four main reasons: BBC's World Service is available on-line 24/7; it is also available on cable-TV; there is a vast network of FM radio stations in the U.S. which carry its programming; and the World Service will be available on XM Satellite Radio.

All four reasons exhibit a strange understanding about this country, its size, the progress of Internet delivery, and the needs of those who want to listen to the World Service. To begin with, the number of listeners with access to high speed Internet service, while perhaps high by British standards, are ridiculous compared to the number who own shortwave radios. Secondly, the availability of World Service via cable TV is microscopic. It is offered on 108 cable systems nationwide serving 5.7 million households. But, there are thousands of cable systems in the U.S. serving tens of millions of households. Third, the vast network of FM radio stations are primarily lower-powered university stations with relatively small signals.

Furthermore, most stations in the network carry only the five minute news bulletins; only a few carry programming of a longer duration once or twice daily. And, finally, while some may opt for spending \$200 for a satellite car radio and the \$120 per year thereafter to hear the World Service in their cars, the vast majority of Americans would rather listen at home on the receiver they already own and do so for free.

If it's only news we're after, most Americans have access to local AM and FM all-news-all-the-time radio stations which churn out a monotonous stream of "headline news" and "news you can use" But, that's not why we listen to the World Service. Most of us listen for content, the global view away from the U.S. media defined line.

C-band Satellite to the Rescue

The cable systems which make the World Service available to their subscribers do so from an audio subcarrier on the C-SPAN signal found on C-band satellite Satcom F3 channel 7. This analog video service is the main C-SPAN channel which has been available to home dish owners for more than 15 years. According to Robin Scullin, C-SPAN spokesperson, they plan to continue making the World Service audio signal available on their channel. So, how can you re-

ceive it?

Since the advent of the small dish, viewers have been abandoning their C-band satellite systems at a record pace. Dealers across America have shelves packed to the ceiling with complete systems they can't get rid of; hamfests and electronic flea markets have tables stacked high with them; and "Buy 'n' Sell" newspapers all over the country have them listed by the dozen. Neighborhoods are filled with big dishes pointed to the ground or just laying on the ground. For the most part these systems are perfectly good and need only be transported to another location, plugged in and turned on. For little or no cost at all you can rescue one of these systems and put it to work for you, tuning the BBC World Service 24/7 with a high fidelity signal you've never heard on your shortwave receiver.

What You'll Need

Of course, if you're rescuing a system from someone's yard you won't have much choice on what you get, but, here are some things to know:

1) For best results the smallest dish you can get away with throughout most of America is 6 feet in diameter. Dishes as small as 4.5-ft can give reasonable results on certain channels and certain satellites, but for reception of Satcom F3,7 you'll need the extra foot and a half gain to get the best audio signal.

2) Look for a 15° or 25° LNBF for the feed horn. An LNBF (Low Noise Block converted Feed horn) is a one-piece combination low-noise amplifier/feed horn which requires only one wire (the RG/6 lead-in cable) to not only get the signal from the dish but to power the amplifier as well. The polarity switch is done without the use of a polarotor. This really simplifies your installation.

3) Look for a receiver which tunes the audio on a display on the front of the receiver as well as an on-screen display. This is because if you're tuning the audio of a VideoCipherII encrypted channel (such as those subcarriers on G5, 7) the on-

screen display will be impossible to read as it wriggles around on the screen. Tuning audio on F3, 7 is not a problem because the video signal is analog and not encrypted.

4) You don't need a motor drive if you will be setting your dish up for reception of only Satcom F3. In some cases your receiver may not have the ability to drive a dish. However, if the system you get does have the dish drive you'll appreciate all the other audio subcarrier services you can receive, such as World Radio Networks 1 & 2. These audio channels bring the world of shortwave listening to the big dish listener and have become one of the reasons many big dish owners haven't switched to the little dish.

5) You'll have to lay your own cable for your new system. If you're using a fixed dish without a drive motor and using an LNBF, you'll only need to run a length of RG/6 from the dish to the receiver inside your house. If you're using a dish drive and LNBF you'll need the RG/6 and a similar length of heavy gauge dish drive wire. This consists of two 16 gauge and one 22 gauge sensor wire. The 16 gauge wires carry the voltage to the dish's DC motor and the 22 gauge wire carries the sensor return, which is how the unit knows when to stop. If you're using a drive with a polarotor motor for switching polarity you'll also need three 20 gauge wires which power the small polarotor motor and its sensor return. Complete direct burial coax/wire bundled cable can be bought new from vendors listed below. Be sure to measure the length from the dish to the receiver, allowing enough wire to reach the feed horn on the dish and to get inside the house and to the receiver.



4.5' surplus spun aluminum dish with analog receiver using a C-band LNBF (courtesy author)

6) The only other thing you'll be required to install is the mount pole on which the dish sits. Whether you have a 6, 8 or 10 foot dish, you'll need a 3.5-in. O.D. schedule 40 steel pipe buried at least 3 feet below grade. The mount pole hole should be one foot to 18 inches wide and filled with QuikCrete or similar easy-to-mix concrete product. If you can't find the pipe locally, Skyvision stocks them.



4.5' surplus dish/receiver picking up perfect picture of NASA-TV on GE-3 C-band. This signal indicates good reception of MPEGII signals such as VOA on this satellite or the international services on Panamsat 9 (courtesy author)

World of Listening for Free

At a time when so many radio services are disappearing or now charging for the privilege of listening, it's good to know that there is a world of listening which you can tune into for free on equipment which costs little or nothing. If you take the time to search the area where you live to find a used system and do the installation yourself, you'll be amazed at the radio excitement that awaits you.

Resources:

Aside from your own local resources, try these places to find new and/or used analog satellite TV equipment:

Global Communications <http://www.global-cm.net> S-9141 State Highway 23 Plain, WI 53577-9612 608-546-2523 or FAX 608-546-2157d
 Smaller Technologies, Inc. P.O. Box 81811 Rochester, MI 48307 877-463-3212 (orders) FAX 888-731-1834
 Skyvision <http://www.skyvision.com> 1010 Frontier Drive Fergus Falls, MN 56537 800-500-9275
 TVRO World aka <http://www.daveswebshop.com> P.O. Box 840 Mulberry, AR 72947-9840

Shortwave Broadcasters On Satellite

Satellite Deg W Long. Xpndr Freq. (MHz) Service
 Satcom C3 131 7 5.20 World Radio Network (WRN1)*
 Satcom C3 131 7 5.40 BBC World Service*
 Galaxy 5 125 6 6.20 World Radio Network 2 (WRN2)*
 Galaxy 5 125 6 6.80 World Radio Network 1 (WRN1)*
 GE 1 103 22 7.38/7.56 Deutsche Welle 1*
 GE 1 103 22 7.74 Deutsche Welle 2*
 Galaxy 11 91 14 7.38 RAI International (Italy)*
 GE 2 85 14 Voice of America +
 Panamsat 9 58 10 China Radio International +
 Panamsat 9 58 16 Deutsche Welle 1 +
 Panamsat 9 58 16 Deutsche Welle 2 +
 Panamsat 9 58 16 Deutsche Welle 7 +
 Panamsat 9 58 16 RDP Antenna 1 (Portugal) +
 Panamsat 9 58 21 RAI International (Italy) +
 NSS 806 40 22 Syrian Radio +
 NSS 806 40 22 Radio France International (Multiple Language Feeds) +
 NSS 806 40 22 Radio Italia +
 NSS 806 40 13 Radio Panamerican
 NSS 806 40 13 La Voz de Bolivia
 NSS 806 40 17 Voice of America (Multiple Feeds English/Spanish VoA

News Now and VoA Music Mix) +
 NSS 806 40 23 7.00 Radio Nacional Argentina*

Notes:

*Use any analog C/ku band receiver
 + Use only MPEGII Digital (Free-to-Air) receiver
 Reception of Panamsat 9 can be done with a dish as small as 4.5' using an MPEGII receiver.
 Reception of NSS806 requires at least 10' and an international feed horn for left and right hand polarization.

Other Analog Radio Services of Note

GE 7 137 5 5.60 Radio Reading Service of the Rockies
 Satcom C3 131 24 7.50 WOKIE TVRO Radio
 Galaxy 5 2 5.58/5.76 KLOM-FM Long Beach, CA (Jazz)
 Galaxy 5 2 8.20 Cable Radio Network
 Galaxy 5 7 5.58/6.12 WCPE Wake Forest, NC (Classical)
 Galaxy 5 7 6.30/6.48 WFMT Chicago (Classical)
 Galaxy 5 7 6.80 Yesterday USA (Old Time Radio)
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Tech-Link Long-Range Hands Free Walkie Talkies – Bad News from Walmart for only \$27.96

This month, Dear Reader, we're going to take a walk on the wild side. We're going to have an adventure that makes any of these "reality" TV shows look like an afternoon in the park. This time, armed only with our keenly honed instincts and a well-used Visa card, we're going to penetrate by stealth and guile into the heart of deepest, darkest suburbia: Walmart!

It all started innocently enough. I was doing my usual early morning routine, which consists of running a computer assistance network on 2-meter ham radio and chatting with my wife.

"What's on your schedule for today?" she asked.

"I've gotta figure out something to write about for *MT*," I answered.

"How about going to Walmart and seeing what they have in two-way communications for kids?" she suggested.

"Superb idea," I said, grabbing the car keys and heading out the door.

Once in the Land of Endless Shopping, I stopped first at the Electronics Department.

There I discovered that several name brand electronics companies – like Uniden, for example – are offering single Family Radio Service handtalkies for a few pennies less than \$20. But I've written a lot about FRS, so I moved on.

In the Toy Department I found a pallet stacked high with dozens of colorful boxes. "Tech-Link Long-Range Hands Free Walkie Talkies," they said. "Totally hands-free communications. Perfect for outdoor activities. Unit easily attaches to any safety helmet," the box copy said. The copy also promised toll-free support and 1 year performance warranty.

Four color pictures adorned all sides of the box, showing adult bicycle riders, a rock climber, and a fly fisherman, all using these incredible walkie talkies for long-range hands free communication. A clear plastic panel on the front of the box revealed two black and yellow units with a control box, headset and boom microphone. And the price was only \$27.96, that's less than two of the cheapest FRS units . . . what a deal! Even after you pay for two nine-volt batteries, the cost was

still just pennies over \$35.

Boy, I was psyched – I could hardly wait to get these babies home and start my new life as a long-range hands free communicator. I didn't realize it until later, but I had been seduced by four-color graphics and well-written box copy. I should have taken a clue, though, from the fact that these two-way radios were being sold in the Toy Department, yet the boxes didn't show children using them. Was there a disconnect here someplace?



The Tech Link units themselves are fairly straightforward. On the front of the control box there is what appears to be a speaker grill (it isn't) and two buttons (they aren't). Neither of these have any real function – they are "design elements." Ditto for the yellow plastic panel that might be a push-to-talk button. The button yellow section comes off to permit the necessary 9-volt battery to be inserted. On the back of the control box is a belt clip. On the top, there is an on/off/volume knob: the only user-activated control.

A wire leads from the top of the control box to the headset. There is a padded headband that is worn over the head. It is very generously sized, and even at its smallest adjustment, I think that many adults will find it too large. On one side, there is a circular earpiece unit to which the flexible boom microphone and a retractable earphone are attached. The earphone, which is a button of hard plastic, is inserted into the ear. Since there is no padding, it can take a bit adjustment to get the earphone into a comfortable position.

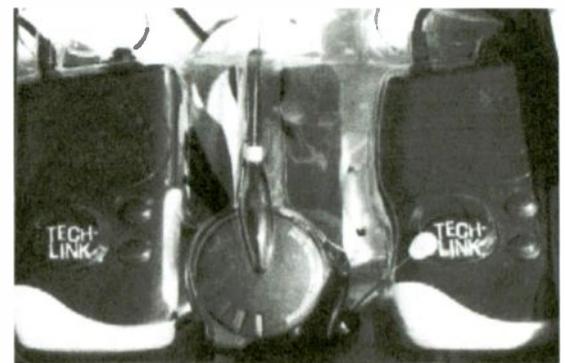
A flexible antenna is attached to the top of the earpiece unit and can be clipped to the headband, although a tag attached to the unit suggests raising the antenna to "maximize the range of your transceiver." The earpiece unit may also be detached from the headband and affixed with an adhesive patch (included) to a safety helmet.

To operate the Tech Link walkie talkies, fit the headband over your head, insert the earphone into your ear, bend the flexible boom so the microphone is in front of your mouth, turn the unit on, and talk.

At very short range (less than 75 feet), the units work reasonably well. Two people can talk back and forth, completely hands free, although even at maximum, the volume in the earphone is not overly loud. As the units get farther apart, a hissing is heard in the earphone. As the distance increases, the hissing gets louder until – at about 100 yards – communication is completely impossible.

The bottom line: the Tech Link walkie talkies work well for only a very limited range of applications such as chatting between two bicyclists who are not far apart or two rock climbers who are not widely separated on the same face. If, however, you are able to use your hands to press the push-to-talk button, even the cheapest FRS units will consistently outperform these so-called "long-range" walkie talkies.

Unless your application absolutely demands hands-free communication, save your money.



AT REVIEW



AOR TDF370 Multimedia Digital Terminal

By Bob Grove

Seldom have we come across an affordable device with so many modes and applications for receiving and transmitting as this new AOR accessory. Operable either as a stand-alone device, or in conjunction with a PC for control, the TDF370 has a tactile membrane keypad and back-lightable LCD display. The two-line display shows encoder/decoder settings in the first line, and up to 16 characters for the message in the second line. The unit may be powered by an optional AC adaptor (9 to 15 volts, regulated preferred), or by four AA alkaline cells (not included).

A built-in speaker allows temporary monitoring of the signal for tuning purposes, but an external speaker is recommended for listening. A pair of ear buds is included for monitoring simulated stereo through the earphone jack; while quite usable, we used a padded, stereo headset. And now let's have a look at all those functions:

A fast Fourier transform (FFT) digital filter scrubs the desired audio contents of a signal clean from background noise.

Simulated stereo lets the desired signal – voice or CW – “hang in the center of your head,” away from the interfering left- and right-channel background interference. Simulated stereo, although not new to communications, works well in the

TDF370. While plenty of filtering is available to further cleanse the signal from interference, the stereo effect alone isolates the desired audio dramatically.

Separate bandpass and adaptive filters do a remarkable job in separating signals from interference. The pushbutton functions work in conjunction with a two-level key for adjusting frequency centers and bandwidths. An automatic notch function is also selectable.

An eight-frequency-band microphone equalizer custom-contours the voice characteristics of your mike and cancels background noise for optimum audio. This is a multiple-application benefit for hams, CBers, public safety and commercial two-way radio users, broadcasting, and public address.

PSK31 (BPSK and QPSK packet) and RTTY (170/425/850 Hz shift radioteletype) signals may be both monitored off the air and displayed on an LCD, as well as generated when the unit is connected to a transceiver and computer. Tuning is effectively accomplished using only the LEDs on the unit's panel.

A digital audio recorder permits the storage of up to 102 seconds of received or transmitted

audio – any mode – in eight memory slots for playback. Since the circuit constantly monitors streaming audio, the activation of the recorder includes six prior seconds of audio so that no information is lost during the slow response time of the operator. Clever idea.

Slow scan TV (9600 bps at 56.7 kHz) is supported by the unit, but requires optional software and a computer for viewing images.

The TDF370 comes with stereo ear buds, computer serial cable, shielded audio cable terminated in 1/8" (3.5 mm) mini plugs, stereo connectors for custom I/O attachment, 8-pin mike connectors, a DC power cord for connection to a recommended regulated supply, and a complete, illustrated manual.

The Bottom Line

All in all, we were very impressed with the capabilities of this welcome accessory. Functions were carefully laid out with an excellent selection of options. The keyboard is easy to use, as are the two rotary controls. Best of all, the sound quality of recovered audio is excellent.

The TDF-370 is available for under \$300 from AOR dealers. (See p.74 for another look.)

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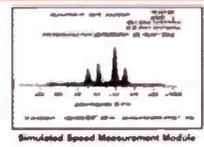
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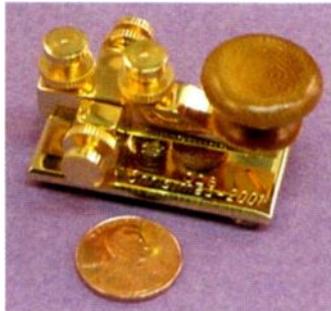
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What's NEW

Tell them you saw it in *Monitoring Times*

The Key to Your Ham

For the amateur radio operator in your life, a clever gift is the Morse Express fully operational miniature key, hand machined from solid brass and plated in gold, ready for hanging on the tree.



Designed by Marshall Emm, N1FN, the tiny 1-3/4" by 15/16" Christmas Key was a challenge for European key maker Llaves Telegraficas Artisanas. The key is provided with all the usual adjustments, so that, even though it's the smallest key the company sells, it's fully operational and comfortable – great for QRP portable operations. Only 200 of these keys were made, each engraved with its serial number, the Morse Express "Speedy Key" logo and "Christmas 2001."

The Christmas Key is \$49.95 plus shipping from Morse Express (2460 South Moline Way, Aurora, CO 80014-1833; 303-752-3382); order toll-free at 800-238-8205 or at <http://www.MorseX.com>.

Adaptec's XHub

Just in time for all of the new computer accessories that will be coming out this Christmas, Adaptec has a new USB hub to increase your number of ports – no crawling around behind the computer and no fussing with tangled cables. This hub is attractive enough to leave on your desktop: its design includes thick frosted plastic covers with brushed aluminum plates, device indicator LEDs, plus a picture frame and built-in cable management system on some models. If you need more than four ports, the XHub comes in a 7-port version, or two 4-port hubs may be stacked for 8 ports!

XHub is compatible with USB 2.0 – the next-generation high-speed interface for both PC and Macintosh. At a maximum speed of 480 Mbps, USB 2.0 technology is forty times faster than USB 1.1 and maintains backward compatibility with USB 1.1 devices. LED indicators show which device is currently in use. All ports are powered for compatibility with bus-powered peripherals. Prices range from \$79 to \$139. For more information, visit <http://www.adaptec.com/>

World Time by Computer

There's nothing so frustrating as reading through a broadcast schedule from a shortwave broadcast station and suddenly realizing it's written in local time. So what time is it in UTC, or, better yet, in *your* local time?! A very handy little computer program by Haxial takes the guesswork out of these calculations. The WorldTime program can give you the current time (and date) for any city you choose, it can convert time between two locations, and it also displays a calendar. For more information or to order, visit the website <http://www.haxial.com>

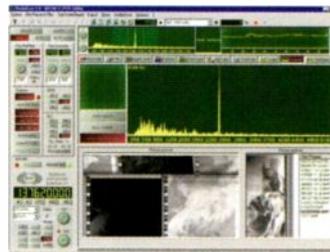
While you're there, also check out the Haxial DiskCatalog utility for cataloging CDs, hard disks, folders, and any other type of disk. It allows you to browse the contents of disks without having to find them and insert them into your computer. More importantly, you can search all of your disks at once (again without having them in the computer), and DiskCatalog will almost instantly display a list of all the files found and their location.

Both these programs are shareware. That means you may download and try out the programs: If you like them, the cost per program is a mere \$10.

Radiocom 5.1 Decoder and Filter

The powerful RadioCom 5.1 software decodes RTTY, CW, WEFAX, SSTV, PSK31, Q and B

PSK, and, in conjunction with your sound card, filters the recovered audio to extract noise-buried signals! Advanced DSP functions enhance video imaging for text, weather maps and other FAX images, and provide as well dual-scope functions, time spectroscopy, audio spectrum analyzer, filter/analyzer curves, audio recording, multiple-notch interference, and satellite tracking to minimize Doppler shift (Sattrack program with world map included). Requires multimedia PC connected to any computer-controlled receiver.



Radiocom 5.1 is a product of the German-based company Bonito, and is now available in the U.S. from Grove Enterprises for \$169.95 (call 1-800-438-8155, visit <http://www.grove-ent.com>, or write 7540 Hwy 64 West, Brasstown, NC 28902).

Australasian Shortwave Guide

The *Australasian Shortwave Guide*, Edition 12, is a 32-page publication compiled by Bob Padula which covers the B-01 (winter) broadcast season up to March 30, 2002. The Guide gives comprehensive information of English schedules to Australia, Asia, the Indian subcontinent, the Far East, and the Pacific, and broadcasts in other languages to Australia and the Pacific.

The data, consisting of some 1500 entries, is arranged in two sections – by studio country and starting time. Each entry shows the broadcasting organization, frequency, starting time, finishing time, language, target region, transmitter site, transmitter country, studio country and days of operation.

To order, sent payment to Bob Padula, 404 Mont Albert Rd, Surrey Hills, Victoria 3127, Australia; Tel/FAX: +61 3 9898 2906 E-mail: bobpadula@bigpond.com – In Australia: AS10 postpaid; Outside of

Australia (airmail): US\$10 (Euro 10, AS20) - cash (any currency), money order, bank draft, travellers' checks, or 13 IRCs. Except for cash, all other payments must be Australian dollars payable at Australian banks.

European FM Handbook 2001

Serious East Coast DXers and European broadcast professionals will find the *European FM Handbook 2001* to be a valuable resource. The book is a directory of country by country lists of FM radio stations in Europe, Russia, Near and Middle East, Central Asia and North Africa. Fields include frequencies, transmitter sites, networks, local stations, addresses and phone numbers, URLs and email addresses. Maps and by-station and by-frequency stations lists are also included. Like the *M-Street Journal*, the 673-page book is not cheap: \$41.67 Euro plus \$17.66 Euro shipping for locations outside Europe.

For more information, check out <http://www.fmdx.com>, write Ab FM Media Plaza Ltd, Eskilomvagen 294, FIN-07880 Liljendal, Finland, or fax 358-19-616077 (English okay).

Information Free for Downloading

The National Criminal Justice Reference Service has a set of books available for free download over the Internet at <http://virlib.ncjrs.org/LawEnforcement.asp>. The documents of most interest to *MT* readers are probably those entitled *Antenna System Guide*, NIJ Guide 202-00 (Chapter x), where x is chapters 1 through 14, issued in 6 volumes. The book arrives in PDF format, but paper versions are available on request. - (Thanks to Robert M. Felton, P.E.)

Books and equipment for announcement or review should be sent to "What's New?" c/o *Monitoring Times*, P.O. Box 98, 7540 Highway 64 West, Brasstown, NC 28902. Press releases may be faxed to 828-837-2216 or emailed to mtditor@grove-ent.com.

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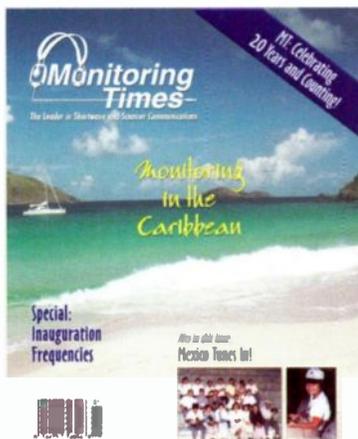
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- 1,000 memory channels (20 banks) with alphanumeric labeling
- Computer control and programming (requires optional cable)
- Download free control software from AOR web site
- "All Mode" reception includes "super narrow" FM plus wide and narrow AM and USB, LSB, CW and standard AM and FM modes
- True carrier reinsertion in USB and LSB modes
Includes 3 KHz SSB filter!
- Detachable MW antenna with negative feedback
- Optional internal slot cards expand capabilities. Choose from Memory Expansion (up to 4,000 memories), CTCSS Squelch & Search, Tone Eliminator, Voice Inverter** and Record Audio (saves up to 20 seconds of audio)
- Tuning steps programmable in multiples of 50 Hz in all modes
- 8.33 KHz airband step is correctly supported
- Noise limiter and attenuator
- Lighted keys
- Band activity "scope" display with "save trace" capability
- Four-way side panel rocker switch allows one-hand operation
- Large display includes A and B VFO frequencies and signal strength meter
- Battery Save function with Low Battery indicator
- Operates on 12 VDC external power
- 4 AA Ni-Cd batteries supplied, also uses standard AA dry cells
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- BNC antenna connect on
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*Cellular blocked. Unblocked version available to authorized users, documentation required. **Available to authorized users only. Specifications subject to change without notice or obligation. All trademarks remain the property of their respective owners.

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