

29, No. 3 March 2001

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How to tune in Europe and get those QSLs!

Scanning Central Florida: The 1-4 Corridor

03



WED) Whands and

SMALL hands



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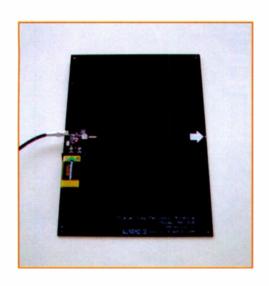
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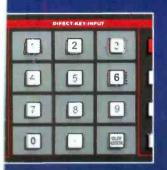
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Vol. 20, No. 3

March 2001



On our Cover

Scanning Central Florida

By John Mayson

Interstate 4 cresses Florida's mid-section from the Atlantic to the Gulf, and passes right by some of the state's largest tourist attractions. In this road trip, the author is in no hurry; he wanders down to the beaches, stops in to say hi to Mickey, and ends his meandering trying to avoid a traffic jam in St. Petersburg. Lucky he brought his scanner along and put together this great list of public safety frequencies from Volusia to Pinellas counties. Don't forget to bring this article along with you on your next trip down I-4. Story starts on page 20.

Cover photo of Ormond Beach and Holcomb Castle by Harry Baughn.

The Key to the EN	GMA Cipher 1	0

By John Maky

Radio buffs who have made it their specialty to listen to, log and categorize those mysterious "counting" or "numbers" stations heard on shortwave have invented a helpful shorthand to identify these signals. Called the ENIGMA code after the European group who created them, these abbreviations are now being used in MT's Utility World Logs. Here is a quick initiation into their meaning.

Listening In On Europe12

By Dave White

"In the world of shortwave listening, those who thrive on chasing DX have Africa, Latin America, and Asia. Those who enjoy a constant supply of informative, entertaining program content have Europe," says the author. Europe provides not only some of the easiest listening, but also some of the best.

The Idiosyncrasies of QSLing Europe16

By Gayle Van Horn

Even though many of the largest and oldest shortwave stations broadcast from Europe, getting a true verification of your reception may not be any easier than getting one from a Third World country. Here are all the addresses you'll need to test it out for yourself!



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Reviews:

Parnass gives the new Uniden BC780XLT Trunk Tracker III "top dog" status among trunking scanners (p.84).

Bob Grove finds an aid for aging ears in the MFJ-616 Speech Intelligibility Enhancer (p.87).

Catalano becomes "Radio Commander" as he finds an ingenious application for inexpensive game software (p. 80).

"Easy access" to the airwaves certainly defines the new Icom IC-718 HF receiver - "lots of fun at reasonable cost" says Elliott (p.74).

For years Henry Kloss has been constructing AM/FM radios to make listening a pleasure: With his new Kloss Model One, he believes he got it right. He did, says reviewer Ken Reitz (p.82).

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Low Power FM Radio Crippled

"One of the fundamental tenets of our democracy is to ensure that diverse interests have opportunities to express themselves at different levels, and that they are not locked out in a monopolistic, globalized fashion. ... Radio is perhaps the most qualified of any media outlet to provide community access. ... Unfortunately, today's radio is the most concentrated and formulaic medium in the country." From a March 10, 1999, letter from Congressman David Bonior to FCC Chairman William Kennard

Most colleges, churches and community groups can forget about an FCC plan to create a new low power FM service. A late added amendment, buried deep within the massive \$1.8 trillion spending bill, has greatly curtailed a pet project of former FCC Chairman Bill Kennard to create 1,000 new low-power FM community radio stations.

The objective was to make the commercial FM airwaves more diverse by offering "niche" non-profit programming from local governments, educational organizations, neighborhoods, and community groups. It was Kennard's view that these voices had been silenced by the proliferation of an increasingly consolidated corporate radio market. At the end of 1999, the top ten broadcasters controlled 2,000 stations.

Existing FM radio broadcasters – represented by the National Association of Broadcasters (NAB) and National Public Radio (NPR) – lobbied long and hard against the initiative out of concern that the new service would siphon off their audience and interfere with their transmissions. When the coalition of lobbyists and broadcasters turned to Congress, the result was the Radio Broadcasting Preservation Act of 2000, (S.3020) introduced Sep. 7th by outgoing Sen. Rod Grams (R-Minn.) and spearheaded by Senate Majority Leader Trent Lott, long a supporter of the NAB.

The original House bill [H.R. 3439] "To prohibit the Federal Communications Commission from establishing rules authorizing the operation of new, low power FM radio stations" was amended in S.3020 to read "A bill to require the FCC to revise its regulations authorizing the operation of new, low-power FM radio stations."

"The 'compromise' legislation allows [low-power radio stations] to go forward, while minimizing interference for millions of radio listeners," said Edward Fritts, head of the National

Association of Broadcasters. In reality, it basically eliminates most of them.

Grams' bill allows up to nine remotely located low-power stations to be licensed right away to test the feasibility of LPFM stations. None can be in metropolitan areas. And instead of the FCC regulating radio stations, Grams' bill essentially transfers authority to approve and regulate LPFM to Congress who would later decide whether to introduce legislation allowing the agency to authorize more micro-radio stations.

Exactly what does the legislation say?

In a nutshell, the Radio Broadcasting Preservation Act of 2000 requires the so-called "third-adjacent channel" protection to be maintained. That means that LPFM stations may not be located three channels away from existing FM stations. This has the effect of eliminating up to 80% of the available LPFM slots. The FCC may license low-power stations in places where there is no need to relax third-channel buffers such as in rural areas that do not have many FM stations.

The bill also specifically forbids the FCC from awarding a LPFM license to any applicant who has engaged in unlicensed operation at any time and under all circumstances.

The bill compels the FCC to further evaluate the need for third-adjacent channel protection. This is to be accomplished by an experimental program in no more than nine FM radio markets to test whether low-power FM radio stations will result in harmful interference to existing FM radio stations.

The FCC also must appoint an independent testing agency to oversee interference field tests, conduct "independent audience listening tests" and the public must be given an opportunity to comment on any interference potential ...a tactic that postpones any hope of full-scale LPFM until many years down the road.

A full report must be submitted by the FCC to Congress addressing the impact on (1) incumbent FM radio broadcasters, (2) the coming transition of terrestrial FM radio broadcasters to digital radio (also known as IBOC – In Band – On Channel), (3) stations that provide a reading service for the blind to the public and (4) FM radio translator stations.

Kennard believes the requirement that the FCC study the economic impact of LPFM stations on existing FM stations is contrary to the NAB's argument that its opposition to

low-power radio is based solely on the potential interference to existing FM stations. Actually, while unsaid, FM broadcasters are equally concerned about listeners being siphoned off to new competition within their market and their ability to attract advertising dollars.

LPFM applications pouring in

The FCC began accepting applications for Low Power FM licenses in phases – a few states at a time. The FCC even went as far as to post "LPFM Channel Finder" software on their website to help applicants locate an FM channel that meets the requirements. See: http://www.fcc.gov/mmb/asd/lpfm.

The first 5-day application period was May 30 to June 8, 2000, the second filing window was Aug. 28th to Sep. 1. The FCC said the third LPFM filing window would open as scheduled for five days beginning Jan. 16, 2001. Already over 1,300 applications for low-power FM licenses have been received from school systems, municipalities, churches, colleges and community groups in the first 20 states. The FCC was preparing to begin awarding licenses when the budget bill amendment was "ram-rodded" through Congress.

The same day that Pres. Clinton signed the budget bill, the FCC announced that it had selected 255 applications from the first 20 states that meet the new scaled-back criteria. School districts, musical arts associations, churches and ethnic organizations are among those chosen. They will receive their construction permits for the stations after a 30-day comment period.

Senate Commerce Committee Chairman John McCain (R-Ariz.), a strong supporter of LPFM stations, will seek to overturn the rider when the Senate reconvenes after the first of the year. He called the budget bill amendment "...an atrocity ...that will hurt minorities and small churches and organizations that want to broadcast local information."

Unlicensed FM broadcasting may escalate

In a Dec. 18th feature story, the San Francisco Chronicle newspaper said it believes "Pirate radio received an unintended boost with the death of the Federal Communications Commission's plan to license hundreds of low-power FM radio stations." National Lawyers Guild spokesman, Philip Tymon believes "What we're going to see now is the resurrection of a lot of unlicensed stations."



Lunar Eclipse over the UK

Lawrence Harris used satellite imagery to predict when or whether the eclipse on January 9 would be visible from his location (see *View from Above*). "Attached is an image taken at 1900UTC during the partial phase when the moon was moving further into the earth's shadow. Heavy cloud cover prevented the best quality imagery being taken, but I felt that this looked rather dramatic. Image taken using CCD camera fitted with 200mm f/l telephoto lens."



Kudos and Congrats

"Thanks to Bill Grove and all for the 'New Look' but especially for the boldface type in the Utility Logs! (We geezers need all the help we can get.) Best wishes for a good 2001! From a long-time (back to newsprint tabloid days) subscriber, Maury Midlo"

"I just received my January issue of *MT* and I just wanted to tell you I love its new look inside! 73, Ryan"

"Congratulations on your 20th anniversary! Time sure goes by quickly when you are having fun. I have enjoyed your *Monitoring Times* thoroughly year after year for almost as long. Jack Planinac K6FCF"

"To my friends at Grove, Thank you so much for the offer of the free electronic version of MT. We will be excited to receive it. The McCreery Middle School Amateur Radio Club will meet sporadically through the summer (field day, events station etc.) so, if it would be ok, just keep it coming! You guys are THE BEST company I've dealt with for all-around radio hobbyists, keep up the good work! Thanks again..73, Bill Menk N3FQL

Remember the Woodpecker?

Brian Rogers, a reader from West Sussex, England, has a website with four articles and a poster relating to the Russian woodpecker signal. He received permission to reproduce an article written some time ago by David Wilson for *Monitoring Times*. He says, "I have had a

lot of interest shown in the articles, which I hope forms a useful resource for those interested in this 'mother of all signals.' The main Woodpecker page is http://dspace.dial.pipex.com/brogers/wpecker.htm"

Roots of the Digital Revolution

Michael Graham forwarded a web site to share with MT readers: http://www.nsa.gov/wwii/papers/start_of_digital_revolution.htm. It's an article entitled "The Start of the Digital Revolution: SIGSALY Secure Digital Voice Communications in World War II" by J. V. Boone and R. R. Peterson. Michael says, "Pretty amazing stuff for the time. Yes, it's on the NSA site-which if you haven't poked around on, there's some cool stuff to be found:-) Thanks for a great magazine, and keep up the good work."

Macs and Below 500

Kevin Carey shared an email with us he received from Barry Williams, ba.williams@home.com. "I enjoy your column in MT and it is one of the reasons I've resubscribed recently. I don't have a lowband receiver yet, but do enjoy MW and HF quite a lot with my R-390As. I have an SP-600 enroute which is supposed to be a real gem. I'm going to start looking for a SP-600 VLF model for the low end stuff, but they are hard to find. Anyway, your info every month is quite fascinating. I am a former Army pilot and beacon chasing will be a nice hobby when I finally get to go after them.

"I too have Macs at home. Tried Windows boxes over the years and learned my lesson. We networked two Macs to cable modem rather quickly one day recently, but my son insisted on a Pentium III box. It took a week and a half to get him networked...and days and days of holding the phone to my head for tech support. I had forgotten how backwards those systems are.

"Your last column about using mostly a Mac hit home. I have run some programs under Virtual PC on my G3 with good results. Now that I am finally retired I plan on getting as many Windows radio applications as possible and seeing how they run under emulation. If you are interested I can let you know the list of what is good and bad. Or, maybe you already know more than I do. There are some good programs out there for Macs. Some are pretty old, but I have some stored away that need cataloging.

"I would be interested in any comments you may have on Macs and radio software...or in buying a LF receiver. Thanks for the great columns."

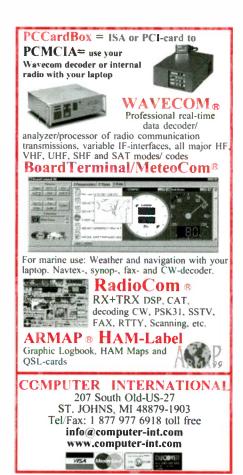
I'm sure you've done the internet research, Barry, but for new Mac owners, a good place to start is Chris Smolinski's page at http://www.blackcatsystems.com/software/ ham.himl For general Mac programs try http://www.ultimatemac.com and http://puremac.com ... rb

Not so blue after all

Doug Smith wrote with regard to Rick Sitz' letter (21st Century Blues) in January MT: "It is indeed scary that egg insulators are now a special order item at Radio Shack. But there are other places you can go. Home Depot (and I'm sure other similar home-improvement stores) sell PVC plumbing supplies. Plastic plumbing couplers make excellent end insulators, and plumbing tees make good center insulators. They're cheap, too. You can get the antenna wire there, too; the stranded stuff they sell for AC power wiring works great for antennas." - Doug Smith W9WI

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*. Happy monitoring!

- Rachel Baughn, KE4OPD, editor



COMMUNICATIONS

Radio Honor Roll

Hams Respond to El Salvador Earthquake

Salvation Army Team Emergency Radio Network Director Pat McPherson, WW9E, conducts a routine daily net on 14.265 MHz at 1500 UTC, but the net was overwhelmed with pleas for and offers of help after the earthquake of January 13 claimed upwards of 700 lives in El Salvador and Guatemala.

Salvation Army International Disaster Services Coordinator Maj Mike Olsen reported that the Salvation Army served more than 18,000 hot meals per day, plus offering medical treatment to earthquake victims. McPherson expressed his appreciation to all amateurs who have been helping in the earthquake relief effort. "This kind of operation continues only through the great support of the Amateur Radio community and the dedication of folks driven to help those in need," he said. "Thanks to you all!"

A team of 22 Turkish rescue personnel was dispatched to the disaster scene. Heading up communications for the Turkish rescue team was Serdar Demirel, TA2NO. The team reportedly was equipped with an INMARSAT telephone and VHF and UHF amateur gear.

New FCC Head

President George W. Bush has named Michael K. Powell to become FCC chairman. Powell, a Republican and an FCC member since 1997, is the son of Secretary of State Gen. Colin Powell.

Powell succeeds William Kennard as the head of the FCC. During his three-year tenure, Kennard presided over major changes in the FCC and in telecommunications while implementing the Telecommunications Act of 1996.

Powell has served as the FCC's Defense Commissioner, responsible for overseeing National Security Emergency Preparedness functions for the Commission, and he also served as the FCC representative to the President's Council on Year 2000 Conversion. Prior to his tenure at the FCC, Powell served as the chief of staff of the Antitrust Division at the Department of Justice. He is a graduate of the Georgetown University Law Center, and holds a degree in government from the College of William and Mary.

The other members of the FCC are Susan Ness, Harold W. Furchtgott-Roth, and Gloria Tristani. Among names mentioned as possible Bush appointees to the FCC is that of Texas Public Utilities Commission Chairman Pat Wood.

March 6: D-Day for Mir

According to news reports, two Russian space agencies have agreed that March 6 will be D-Day for the *Mir* space station—"Deorbiting Day," that is. The more than 130-ton spacecraft will be pushed out of Earth orbit using Progress rockets. According to the Russian Aviation and

Space Agency and RKK Energia, a Progress cargo ship with increased fuel capacity will be launched to *Mir* January 18. It will displace a Progress rocket already docked to *Mir*.

The second Progress – heavily loaded with fuel for the deorbiting missions – will dock January 22. In the event of docking problems, Russia is prepared to send up an emergency cosmonaut crew to complete the job.

Mir's attitude control system will be disabled. Then, on March 4 and 5, the Progress will fire its engines and brake the station's orbital velocity. On March 6, the Progress will deliver the killer blow, firing to decrease Mir's velocity to the point where it will drop out of orbit. What's left of the space station after it passes through Earth's atmosphere will plunge into the Pacific later that day. It's expected that the scuttling of Mir will generate a shower of debris that could reach Earth's surface.

Canada plans to lower Morse requirement

Canada's equivalent to the Federal Communications Commission (FCC), Industry Canada, has issued a Notice indicating their intent to amend Radio Information Circular RIC-2, to: "Grant Full Operating Privileges in all Amateur Radio Frequency Bands Below 30 MHz to Amateur Radio Operators Holding a 5 word per minute (w.p.m.) Morse Code Qualification." The full notice can be found on the Industry Canada Web site at: http://strategis.ic.gc.ca/SSG/sf05327e.html

The U.S. passed a similar measure in April 2000. The Amateur Radio Relay League (ARRL) plans to reexamine its 1993 Board resolution, which supports keeping the International Radio Regulations provision requiring applicants to demonstrate the ability to send and receive Morse code before they may operate below 30 MHz.

Take my wife, please

A Kenosha, Wisconsin, man listening on his scanner was entertained as he followed the progress of police chasing a suspected drunken driver a few days after Christmas. The female driver slowed to a stop and was finally arrested after zig-zagging through several neighborhoods at speeds of less than 35 mph. However, minor amusement soon turned to shock when the man heard his wife's name mentioned on the radio as the suspect.

Officer Paul Torres said the woman's husband showed up at the Police Department to claim the keys to the pickup truck his wife had been driving. The man refused to bail out his wife, however. "He said, 'You can keep her,' "Torres said. The woman reportedly told police she was afraid to pull over because of an earlier arrest for drunken driving.

A New GPS Sport

Do you have a GPS? Wonder what to do with it? Try hunting for "buried treasure"!



March 9-10: Kulpsville, PA

14th Annual Winter SWL Fest sponsored by NASWA at Best Western—The Inn at Towamencin (formerly Haliday Inn). For rooms call (215) 368-3800; mention SWL Fest for special \$75 rate. Located at Exit 31 af the PA Turnpike Northeast Extension-Lansdale Interchange. Lima service is available from Phila. Intl Airport directly to the hatel.

Forums Friday and Saturday. No frills; just shortwave, langwave, mediumwave, pirates, and scanning. Saturday lunch pizza & salad buffet. Grand prize, silent benefit auction (brings items to be auctioned), roffle, haspitality room, Saturday banquet.

Late ar On-Site Registration - Full registration: \$50; Twoday (na meals): \$20; One-day (na meals): \$10; Banquet anly spouse/ son/ daughter: \$20. Send check ta SWL Winterfest, P. O. Bax 4153, Clifton Park, NY 12065

Up to the minute info on the Winter SWL Fest Web Page of http://www.trsc.com/winterfest.html or from http://www.onorc.org/naswa/.

SKYWARN Weather Observation Training: St Louis Co, MO

Saturday all-day classes: March 10, 17, April 7 Evening classes, level 1: March 21, 29

Level 1 training marning, Level 2 training afternoon. Far locations and recorded info call 314-615-7857. Anyone may attend for SKYWARN and RACES certification; no charge. Monitor 146.940 MHz for severe weather net.

March 10: Harrison, AR

North Arkansos Amateur Radio Society hamfest at the Harrison Junior High School Cafeteria (515 South Pine Street - Highway 7 Sauth), 8:00a.m.-1p.m., adm. \$5, under 16 free. To reserve tables: Bill Rase, N5VKF, 870-741-6968 ar e-mail billnose@cswnet.com VE Testing, Refreshments, prizes, free parking, free tailgating.

March 17-18: Midland, TX

Midland ARC annual St. Patrick's Day Hamfest 8:00 - 5:00 Saturday, and 8:00 - 2:00 Sunday at Midland County Exhibit Building. Huge flea market inside, many dealers, large tailgate area, T-hunts, and full service concession stand. V.E. exams given at I PM on Saturday. Adm. S8. For more information, Midland Amateur Radia Club, P.O. Box 4401, Midland, TX 79704; ar e-moil Larry Nix, N5TQU oilman29@home.com ar view http:// www.w5qgg.org.

March 31-April 1: Timonium, MD

30th annual Greater Baltimare Hamboree and Camputerfest at MD State Fairgrounds, Exit 16A aff 1-83 North, 8am-5pm and 8a.m.-3p.m. Far more information see http://www.gbhc.org, call 410-HAM-FEST ar (autside Md) 800-HAM-FEST ar write GB&H, PO Bax 95, Timonium, MD 21094-0095

Reception Reports

CHWO - AM 740 - Prime Time Radia, acknowledges all correct reception reparts with a QSL card, information sheet on the station's history and transmitters as well as a program schedule. The QSLs will be issued by the Ontaria DX Association: QSL manager Brian Smith. Far fastest service send reception reports to: Ontaria DX Association, P.O. Bax 161 Station 'A', Willowdale, Ontaria, Canada, M2N 558, or via odxa@compuserve.com (Attn: QSL Manager)

COMMUNICATIONS

There is a new sport called GeoCaching. Folks hide a small cache made up of a plastic food container, plastic bucket, military ammo can or the like and place it slightly off the beaten path. The latitude and longitude are then published on the internet at http://www.geocaching.com and then the fun starts.

Inside each cache are a number of things. Usually a logbook and pen, somtimes a disposable camera, and then miscellaneous inexpensive goodies. Using the GPS with the lat/log from the internet, folks search and find the GeoCache. When they do, they sign the logbook, take a photo of themselves if there is a camera, and maybe take one of the small treasures, replacing it with a new treasure they brought. Then they hide the box back where they found it for the next searcher to find. - Richard Amirault

AO-40 Antenna Systems May Be Damaged

The latest information on AO-40 (the Phase 3D amateur satellite project) suggests that the satellite might have suffered antenna system damage when it went silent last December 13. The satellite stopped transmitting while ground controllers were testing the propulsion system.

AMSAT-DL Vice President Peter Guelzow, DB2OS, reports that while the 2meter, 70 cm and 1.2 GHz receivers are working on the high-gain antennas, none of them will work on the omnidirectional antennas. He speculated that either the omnidirectional antennas or the cabling or the antenna relays are damaged.

Guelzow said that AO-40's attitude control system is fully functional - something that would be critical to keeping the satellite in orbit on a long-term basis. But, the sun sensor's electronics have quit working. Guelzow expressed the hope that once the sun angle and antennapointing capabilities have been established, the ground crews will have a better chance to check out the status of the 2 meter and 70 cm transmitters through "better-controlled and suitable experiments.

British Gadget Guru Dies

Bob Tomalski, "gadget guru" for Radio Netherlands' Media Network and other broadcast and print publications passed away on Saturday 13th of January. The British "technojournalist" was passionately interested in new trends. "Whether its recordable CD, a digital camera or a DVD player, I'm a sucker for buying them first," he said.

In the 1970s he was involved with many of the London free radio stations, putting pressure on the British government to open up the airwaves. He was a regular guest "guru" on the new stations such as GLR, Capital Radio and LBC. He

broke several technical scoops on UK television and lately was a regular guest on Sky News.

In fact, it was as he was preparing for a scheduled appearance on Sky Television's Technofile program that he suffered a fatal heart attack. He was about to turn 48 years of age. These web pages were posted in tribute and may still be active:

Tom Sundstrom -

http://www.trsc.com/musing_2001-01-18.html Jonathan Marks at RNW -

http://www.rnw.nl/realradio/html/tomalski010118.html Bob's homepage -

http://www.medianet.demon.co.uk/ WV, Bob's publisher -

http://www.homecinemachoice.com/news/index.html

"Communications" is compiled by Rachel Baughn, editor, from newsclippings sent in by our readers. Many thanks to this month's reporters: Sterling Marcher, La Mirada, CA; Doug Robertson, Oxnard, CA; Robert Thomas, Bridgeport, CT. Via e-mail: Richard Amirault, P. Blumstein, Trevor Brook, Chanel Cordell, Robert Felton, Christopher Fleming, Paula Glovick, Maury Midlo, Eddie Muro, Laura Quarantiello, Tom Roach, Ryan, Tom Sundstrom, Rene Valladares, Jon Van Allen, Larry Van Horn, Robert Wyman. Our special thanks to the ARRL Letter.

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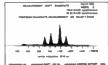
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The Key to the ENIGMA cipher...

by John Maky AC5ZX

flentimes when you see a spy "numbers" station log, such as in MT's Utility World, you will see it referred to with a letter/number code. These codes, created by the European Numbers Information Gathering and Monitoring Association (ENIGMA) group in England, are used by numbers enthusiasts to differentiate between these mysterious broadcasts. It certainly adds to the intrigue to call these stations by such names as "The English Woman," "The Russian Man," or "Bulgarian Betty." However, once you really analyze these transmissions in detail, you will soon find languages are not necessarily a clue as to their origin. Although somewhat confusing to the uninitiated, these ENIGMA designations are relatively simple once you get used to them, and they provide a more accurate description once they are understood.

The first letter simply identifies the language or mode used by the station. These are...

- E English
- S Slovic
- G German
- V Various languages (including Spanish and oriental dialects)
- X Digital or unidentified modes

The number(s) that follow this identify the individual stations. Additionally, sometimes a suffix is added to further sub-classify variations of the same broadcast. You will soon see that "families" of these stations develop; as one intelligence agency will often operate with multiple languages and modes. Here are some examples of the most commonly reported stations...

E3

The "Lincolnshire Poacher" (England - Military Intelligence 6) is named for the interval signal sent at the top of the hour. It operates from 1200-2200UTC seven days a week. The message starts at :10 past the hour and consists of exactly 200 five-figure groups; each repeated twice. The synthesized female voice used has a distinctive English accent. The most commonly reported frequencies in North America are 9251, 11545, 12603, 13375, 14487, 15682, and 16084 kHz in

USB. It is believed to be sent from British facilities inside Cyprus. The station is frequently

E3a

"Cherry Ripe" (England/MI6) also named for the tune chosen as an interval signal. Like its sister station, the Lincolnshire Poacher, it sends 200 five-figure groups – each one repeated twice. Cherry Ripe operates at 1000-1300 and 2200-0100 UTC. The frequencies used are 17499, 19884, 20474, 22108, 23461, and 24644 – all in USB. Cherry Ripe does not send traffic on weekends. Because of the different format and interval signal, it has been assigned an (a) suffix. It is thought to be transmitted from Guam.

E5

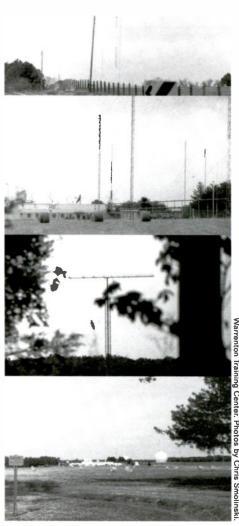
"The Counting Station" (USA/CIA) will send five-figure groups (with a distinctive pause between the third and fourth digits) after ten minutes of counting from 1-0. This "count" will be interspersed with the recipient's call. Why this station counts is open to speculation, but may be simply to show how the text is to be presented. The entire message is repeated once, and never has more than 225 groups.

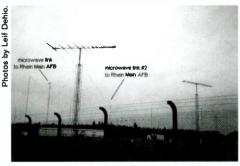
The Counting Station uses a form of reducedcarrier AM and sometimes USB. E5 can be found on many frequencies and will often stay on a set schedule for months. It can sometimes be found by searching through frequencies traditionally used in the past. This station is thought to be transmitted from Warrenton, Virginia, and also from US facilities near Frankfurt, Germany. It is interesting to note that The Counting Station generates significantly more traffic during times of international crisis.

E10

Believed to be part of Israel's MOSSAD organization, "Three-Letter Phonetic" stations are found on over 100 different frequencies. The name derives from the phonetically pronounced calls of CIO, EZI, ULX, YHF, KPA, VLB, or SYN







heard at the beginning of a broadcast. Frequently these calls are followed by the number "2" which indicates there is no message to follow. Traffic is passed in five-letter groups by a female voice. E10 uses a form of AM that is most easily heard in USB mode. This is by far the most active numbers station in amount of broadcasts, but is often difficult to hear in North America.

E17

"The English Woman" (post-KGB intelligence services) sends five-figure groups, each repeated twice, with the broadcast ending 00000. The synthesized voice is somewhat gender neutral, causing the station to sometimes mistakenly reported as E6, "The English Man." This station starts at any fifteen minute period during the hour, and puts a powerful signal into North America. E17 is thought to be sent from Russian facilities inside Cuba.

It has both Morse code (M14) and digital (XPH) counterparts listed below. E17 operates on seemingly random frequencies. Sometimes the station can be located by keeping an eye on irregular AM carriers found in the utility bands. The family of Russian stations is the most diverse in languages and operating modes, and therefore has the highest number of ENIGMA designators.

V2

The original "Atencion" station (Cuba/DGI) sends five-figure groups in Spanish. The name comes from the interval signal calling a three-digit addressee to "attention" at the top of the hour. This station has been on the air for over thirty years, and will only send traffic to one recipient. V2 will operate on a frequency for months; then suddenly change. V2 uses AM mode with a typically noisy carrier.

V2a

The newer "Atencion" station. This version first appeared in 1996 and is by far the most active of the two. It sends three 150-group messages to three different addressees starting on the top of the hour. Like V2, this station will stay on one frequency for months; then abruptly change. V2a also uses AM, and has a Morse code counterpart - M8a.

V5

"The Counting Station" just like E5, but this



version sends its traffic in Spanish. This station will often remain on a schedule for years. Recent schedules are (all times in UTC) 0100 Wed/Fri on 13452//15651, 0300 Mon/Thu on 10665//11491, and 0300 Tue/Sat on 12300.5//14421. All these seem to be transmitted from the Warrenton, Virginia, site, so they are very easy to hear in the US. The Counting Station also had a German (G5) and Morse (M68) version once, but neither has been heard for some years.

V13

"New Star Broadcasting" (possibly Taiwan) uses four-figure group text in Mandarin Chinese. It can be found at the top and bottom of the hour on 8300, 9725, 11430, 13750, and 15388kHz. It operates between 2300-1600 UTC in AM mode. The V13 interval signal is a short oriental-sounding tune played on a flute. The energetic female announcer ends the broadcast wishing the recipient "health and happiness."

M8a

The Morse version of V2a sends its fiveletter group traffic in what is called "cut" numbers. This method consists of substituting the letters ANDUWRIGMT in place of numbers. It is much faster sending traffic in this fashion, as these are the shortest Morse characters. The station can be found starting at the top of the hour with its call to three different addressees. It operates on the same frequencies currently in use by V2a.

M14

The CW version of E17. The message is sent in rapid five-figure groups, with each group sent twice. This station also puts a tremendous signal into the US, sometimes using AM (modulated CW) mode. M14's traffic starts at any fifteen minute period during the hour. Transmissions utilize a "short" zero (sent as the character T) in the message text. The broadcast ends with 00000.

M16

A CW station thought to be operating from France, using the bogus callsign 8BY. The transmissions last for twenty minutes, starting at :40 past the hour. The traffic consists of groups of three numbers, each divided by the slash symbol. It can be found on four frequencies selected from 7668, 10248, 12075, 14931, 18415, or 20945 kHz.

M22

Using callsign 4XZ, this station transmits 24 hours a day (usually a VVV marker) on a number of frequencies. Some of these are 4331, 6379, 8437, 9263, 10046, 10356, 14649, 17050, and 18482 kHz. This station is believed to be broadcast from Haifa, Israel. It is uncertain if this is directly associated with E10 transmissions; however, M22 has been noted mixing with them.

MX

Russian single-letter high-frequency channel markers are found in clusters near 5465, 7039, 8495, 10872, 13528, 16332, plus many others. The CW characters "C" and "S" are the ones most commonly heard in the US. It has been reported that these transmissions are propagation beacons used by the Russian Navy.

XPH

The "High-Pitch Polytone" station sends traffic at :20 minute intervals during the hour; most commonly starting at 0600 and 2000 UTC. It can be recognized by the eerie sounding call-up, which precedes a rapid-firing of digital tones containing the message. This station, as with most Russian stations, ends with tones representing zeros.

XOV

"The Whales" or "Backwards Music Station" is often located near US military frequencies. No one is certain what these sounds are; but is probably an encrypted digital mode. This station is commonly found near 6817 and 11209 kHz.

There are over 200 numbers stations and their variants in ENIGMA's classification list – far too numerous to list completely, and many have gone silent. The best way to find current information is by joining the SPOOKS reflector. This is easy to do by sending an e-mail to majordomo@qth.net and in the body of the message type subscribe spooks. You will then be sent an e-mail explaining how to complete the subscription.

The ENIGMA group used to put out an excellent newsletter, but it is no longer being published. The association still exists, however, and will continue to perform analysis on these stations. Their website is located at... http://www.beaumont11.fsnet.co.uk/640x480/4.0/enter.html

Three other excellent websites to visit have a wealth of information, current schedules, and some have a complete list of ENIGMA designators. They are:

http://www.spynumbers.com/ http://home.luna.nl/~ary/ http://www.cvni.net/radio/nsnl/

Now that you have a basic introduction into the numbers scene, listen in. Send your logs from this subversive side of radio to MT's Utility World editor.



Listening In On Europe

by Dave White

QSLs courtesy SWL QSL Card Museum, http://www.antique-corner.com/SWLOSL

n the world of shortwave listening, those who thrive on chasing DX have Africa, Latin America, and Asia. Those who enjoy a constant supply of informative, entertaining program content have Europe.

Of course, Europe doesn't have all of the world's best internationally broadcast programs, but as a listening target, it has more than its share. The 2001 edition of Passport to World Band Radio features what it calls "Ten of the Best: 2001's Top Shows." Nine of them come from European broadcasters.

Some of the earliest roots of international broadcasting are deep in European soil, where many of the oldest and largest shortwave stations reside. It's common for these broadcasters to be celebrating 60th, 70th, or even 75th anniversaries. Europe has also long been a place from which broadcasters based in other parts of the world beam some of their programs.

While there's a certain thrill from digging a weak signal in an exotic language out of a sea of static, it's nice that there's a part of the world where virtually every country has a high power external service, with English language programming ranging from a few minutes to 24 hours a day.

European broadcasters have not been immune from budget cuts, political influence, or changes in philosophy and direction. Some have eliminated entire language services, or reduced the number of hours programmed. Some have shifted resources from shortwave to emerging broadcast technologies, particularly satellite and Internet. Some of the smallest, like Radio Luxembourg and Radio Andorra, have left shortwave altogether. Some, like Radio Yugoslavia, have been forced off the air indefinitely by war and political upheaval.

These ups and downs notwithstanding, worldwide shortwave broadcasting is alive and well in Europe, and while we hobbyists may not be the intended target audience, we are decidedly among the beneficiaries.

Easy Listening

Some European stations can be a bit of a challenge to receive in North America, but Europeans are, by and large, among the easiest loggings. Most transmit on multiple frequencies throughout the shortwave spectrum, using high wattage transmitters strategically located throughout the world. The

fact that so much of their programming is in English helps make identifying stations relatively easy. With a few exceptions, they tend to be on frequencies where there's little or no interference from other

So, it's possible to listen to European stations literally at any hour of the day or night, on even the most modest equipment. For example, as this is being written, it's 10 AM in the Central time zone, and I'm listening to Spain's Radio Exterior España on a meager Radio Shack DX-395 portable with a bent telescoping antenna!

For the most part, program schedules for European stations are widely disseminated and easy to come by. Of course, your best source for an hour-by-hour listing of English language programs is MT's monthly Shortwave Guide, Virtually every station on the continent that has an external shortwave service also has a website with current program, frequency and schedule information.

We'll begin our tour in the part of the region that is the closest, both geographically and culturally, to North America.

British Isles

Even the newest or most casual listener has likely heard at least one of BBC World Service's program streams on its dozens of frequencies. BBC began its external service in 1932, and today claims a worldwide audience of 151 million.



Although it has undergone substantial changes in the past year, its program lineup is one of the most diverse in the world: news, music,

drama, religion, talk shows, and quiz shows. It broadcasts in nearly 40 languages, with English predominant.

Radio Telefis Eireann (RTE Ireland) is celebrating its 75th anniversary this year, though its shortwave service is limited to half-hour daily segments on leased transmitters located in Britain, Canada, Singapore and Ascension Islands.

Wales Radio International consists of a weekly half-hour program called "Celtic Notes" which airs via leased transmitters in Britain.

United Nations Radio beams some of its daily 15-minute programs to Africa via transmitters in Britain.

Some of Radio Liberty's broadcasts originate from here.

Probably the only place to hear "underground dance music" on shortwave is on Britain's Virgin Radio / Global Sound Kitchen. It airs late nights (UTC) on weekends.

Western Europe

Radio France Internationale is another of the well-known "big gun" broadcasters. RFI has discontinued English programs beamed to North America, but their English service to Europe, Africa and Asia is usually audible in the U.S.

Italy is a major European country with a big

stake in promoting tourism, but RAI International broadcasts English in only a few 10-, 15- and 20minute snippets throughout the day. Italian Radio Relay Service (IRRS) hires out its shortwave transmitters to a mixture of program services ranging from religion to technology to old radio drama.



The small island na-

tion of Malta is represented on shortwave by Voice of the Mediterranean, which is broadcast on transmitters located in nearby Italy and in Russia.

Sicily, another Italian neighbor in the Mediterranean, is home to one of the network of Armed Forces Network (AFRTS) stations that broadcast to service personnel at sea and on foreign soil.

Portugal's RDP International is one of the few major European broadcasters that have no English broadcasts. Radio Portugal does beam several hours of programming each day to North America, in Portuguese.

Spain's Radio Exterior de España (REE) broadcasts primarily in Spanish, but offers five hours of English each day to Europe, Africa and North America. Radio Free Europe and Radio Liberty also broadcast from Spain.

Switzerland is known for its beautiful Al-



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50' of RG-6U cable	CBL 50	\$19.95*
100' of RG-6U cable	CBL 100	\$24.95*
Universal Cigarette Adaptor	DCC 3	\$12.95
GRE Super Amplifier	PRE 1	\$49.95
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Scancat Gold for Windows SE Upgrade	SFT 23E SFT 22-01	\$59.95 \$34.95
2001 Police Call CD-ROM	3F1 ZZ-UI	\$34.73

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pine scenery and its absolute impartiality in world politics. Both are reflected in Swiss Radio International's programs. SRI offers a hefty schedule of English broadcasts.

The smallest country in the world is home of one of the oldest shortwave services. Vatican Radio has broadcast information about the Catholic Church worldwide since 1931. Today it broadcasts in about three-dozen languages, including English, using transmitters on its own soil, as well as in Russia, Uzbekistan and the Philippines.

Northern Europe (Scandinavia)

Radio Sweden offers the most English pro-



gramming of any Scandinavian station, both in quantity and variety, covering news, health, economy, environment, and Swedish culture. English is beamed to North America 4-1/2 hours a day.

YLE Radio Finland broadcasts in half a dozen languages, including 11-1/

2 hours of English to North America daily. Finland is also home to the fledgling Scandinavian Weekend Radio, which operates for 24 hours at a time on the first Saturday of each month. Billed as Scandinavia's first private shortwave station, SWR runs just 50 watts but its monthly broadcasts are usually heard in the Eastern part of North America.

For more than 50 years, Radio Norway International has broadcast its view of the world from some of its northernmost inhabited reaches. RNI currently beams some 13 hours of programs to North America each day, none of it in English. All of RNI's programs are in Norwegian.

Radio Denmark, using Radio Norway's transmitters, also eschews English in favor of all Danish language programming. 25-minute segments are beamed to North America at various times throughout the day.

Iceland Radio exists to reach fishing boats and Icelanders overseas, so some of its native language broadcasts are beamed to the U.S. Armed Forces Network (AFRTS) is awaiting Icelandic government approval to begin operating one of its shortwave relay stations here.

Central Europe

The epicenter of shortwave broadcasting in

Europe would seem to be Germany. The Deutsche Welle dynasty includes shortwave, medium wave and satellite broadcasting. DW has operated a regular shortwave service since 1953 and, while it has cut some of its 30+ language services, its extensive English schedule has been maintained. Germany also



has several domestic broadcasters that are heard overseas, including Bayerischer Rundfunk, Sudwestrundfunk, Deutschland Radio Berlin, and Radio Bremen. Radio Free Europe and Radio Lib-

erty operate transmitters here, as do a number of non-European broadcasters, and several clandestine stations beaming signals to places like Burma (Myanmar), China, and Ethiopia.

Neighboring Netherlands is smaller but no less influential in media circles. It was the first country in Europe to begin regular shortwave broadcasting. Radio Netherlands was established in 1927 and today is one of the most popular outlets in the world via its radio, TV, and Internet operations. Radio Netherlands carries an extensive English schedule, with powerful relay transmitters scattered around the globe. RN was one of the first broadcasters to use satellites to send programs to its relay transmitters, and is at the forefront of a joint effort by several European broadcasters to establish worldwide standards for digital AM.

Radio Austria (ORF) recently suffered some huge budget hits that forced it to reduce its staff and broadcast schedule, and to move into the building housing Austria's domestic radio service. ORF still manages to maintain a substantial English language service.

Most of the programs on Belgium's Radio Vlaanderen are in Dutch, but there are a few hours of English daily to Europe, Asia, and North America. RTBF International is Belgium's French shortwave service, using transmitters located in

Radio Prague has been around since 1936, first as a Soviet Communist propaganda outlet. It now represents an independent Czech Republic with programs in a half dozen languages, including several hours a day in English.

Representing the other half of the former Czechoslovakia, Radio Slovakia International came into being in 1993. It broadcasts four halfhours of English each day.

Radio Budapest offers a diet primarily of news, commentary, and features. English programs are 30-minutes long, and are broadcast four times a day to North America and Europe.

Polish Radio Warsaw beams its English broadcasts to Europe, but is fairly easy to hear throughout the rest of the world. Poland is also home to Radio Racja, a station opposed to the government of Belarus, broadcasting exclusively in Belarusian

Southeastern Europe (Balkan States)

Shortwave broadcasting in Greece began in 1940. Today, Voice of Greece offers a number of English broadcasts throughout the day, from its transmitters on home soil, and via Voice of America transmitters in Delano, California. It's all Greek on Radio Makedonias, also known as Macedonia Radio Station. Radio Free Europe and Radio Liberty also operate transmitters here.

A former Communist voice, Radio Tirana in Albania is another old-timer, beginning operations in 1938. It has trimmed its English service considerably, down to 90-minutes a day.

Radio Romania International is dedicated to teaching the world everything there is to know about Romania. English broadcasts are beamed throughout the day, throughout the world.

In Bulgaria, shortwave service dates back to 1929. Radio Bulgaria offers a modicum of English programming, and airs a variety of interesting music and information programs.

Croatian Radio broadcasts almost entirely in Croatian, but does sprinkle brief English segments throughout its schedule.

Further to the east are another 20 or so countries that make up the Commonwealth of Independent States, countries that formerly made up what was known as the Soviet Union. But, alas, that's another article altogether!

The Future

European broadcasters continue to maintain a longstanding tradition of innovation. Fundamental changes in the way programming is delivered are already underway, with satellites and Internet playing an ever-increasing role. Regardless, there are still many millions of people in the world who don't have access to the new technologies, and whose link to the world is by way of conventional shortwave radio.

There will, no doubt, be more changes in programming directions, staffs, and technical resources. But for now, and for the foreseeable future, international broadcasting as we know it is alive and well in Europe. For that, those of us who may never get closer to Paris, Rome, or London than our radio rooms, are grateful.

About the author

Dave White (dave@k4cc.net) welcomes your comments, suggestions, and tales of shortwave listening adventures.

OVERSEAS GUESTS

Europe is a favorite location of non-European International Broadcasters

ADVENTIST WORLD RADIO Germony	RAINBOW RADIO Germony
Italy	,
Slovakio	TRANS WORLD RADIO
	Albanio
ARMED FORCES NETWORK	Armenia
Iceland (pending)	Germony
Sicily	Moldova
•	Monaco
CHINA RADIO INT'L	Russia
France	Uzbekistan
Spain	
	IINITER METHODICT D

GOOD NEWS WORLD RADIO Germany

HCIB-ECUADOR Great Britain

OVERCOMER MINISTRY Germony

RADIO CANADA INT'L Austrin Germony Great Britain

RADIO JAPAN Great Britain

RADIO KOREA INT'L Great Britain

RADIO TAIPEI INT'L Great Britain

UNITED METHODIST RADIO Germony

UNIVERSAL LIFE Germany

VOICE OF AMERICA Germany Great Britain Greece

VOICE OF HOPE Germony

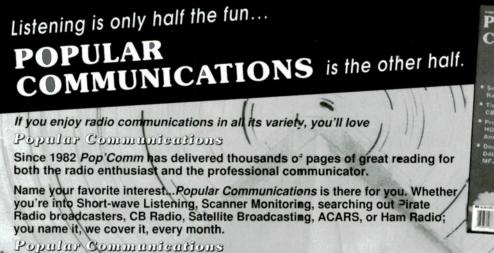
VOICE OF RUSSIA Ireland Vatican City

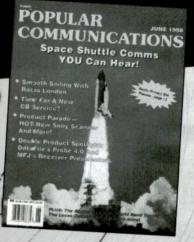
WORLD REACON Great Britain

WYFR Great Britain

EUROPEAN SHORTWAVE SMORGASBORD

(Times UTC, frequencies kHz) Virgin Radio / Global Sound Kitchen Deutschland Radia-Berlin 1500-1700 15735, 18950 (See MT Shortwave Guide for English language broad-2200-2400 3955, 6170, 7165 Fr/Sa 6005 24 hrs. 1700-1900 18950 0000-0200 3955, 6180, 7165 cast schedules from the following stations:) Sa/Su 1900-2000 15705 Radio Bremen Radio Tirana 2300-0200 9945 **Wales Radio International** 6190 24 hrs. **AUSTRIA** Radio Austria International (ORF) 2130-2200 Fr 6010 to Europe **POLAND** BELGIUM Radio Vlaanderen International 0300-0330 Sa 9735 to North America **BRITISH ISLES** Sudwestrundfunk Polish Radio Worsow **BBC World Service** 1130-1200 Sπ 17650 to Australasia 6030, 7265 24 hrs. English to Europe BULGARIA Rodio Bulgaria 6095, 7270, 9525, 11820 CZECH REPUBLIC 1300-1355 Radio Praque **CROATIA GREECE** 2030-2125 6030, 7185, 7265, 9540 **FINLAND** LE Radio Finland Croation Radio Rodio Mokedonios Radio France Internationale FRANCE to Europe / Africa Greek language service Radio Racja **GERMANY** Deutsche Welle 0500-1830 6165 9935 0600-2300 to Europe Belarusian longuage service GREECE Voice of Greece 0500-2100 13830 0600-2300 11595 ta Africa, Midde East, Russia 0600-0800 HUNGARY Radio Budapest 0600-1800 5830 1400-2300 7430 to Europe 1100-1300 6180 ITALY IRRS 2030-2315 6165 1900-2100 6050 RAI International **ICELAND NETHERLANDS** Radia Netherlands **DENMARK** Iceland Radio **PORTUGAL** ROMANIA Rodio Romania International Rodio Denmork Icelandic language service Radio Portugal **SWEDEN** Radio Sweden Danish to North America 1215-1300 13865 to Europe Portuguese service to USA 0030-0055 **SWITZERLAND** Swiss Radio International 9945 1410-1440 13860 to USA 0000-0300 (Tu-Sa) 9715, 11655 0130-0155 9945 11402 VATICAN CITY Vatican Radio 1755-1830 to Europe 0600-0800 (Mo-Fr) 11675, 15585 0230-0255 9590 1835-1905 13860 to USA 1300-2400 15540 1330-1355 18950 **BELGIUM** 2300-2330 11402 to USA 1430-1455 18950 **SLOVAKIA** RTBF International 1530-1555 15735 Rodio Slovakia International French language service 1630-1655 18950 **MALTA** 0400-1930 9970 to Europe English service 1830-1855 18950 Voice of the Mediterranean 9490, 17580, 21565, 17570 to Africa 0100-0130 5930, 7230, 9440 1930-1955 15705 English longuage service 0700-0730 15640,17550,21705 2330-2355 9945 0700-0730 (exc. Sun.) 7150 1730-1800 5915, 6055, 7345 **BRITISH ISLES** 0900-1000 (Sun.) 11770 **RTE Ireland** 1930-2000 5915, 6055, 7345 **FINLAND** 0130-0200 6155 to Central America 2000-2100 (exc. Fri.) 7440 Scandinavian Weekend Radio **SPAIN** 1000-1030 11740 to Australosio 1s Saturday each month 1800-1830 9895 to Middle East Radio Exterior de España 2200 Fr - 2200 Sa 11690, 11720 **NORWAY** 1830-1900 13640, 21630 to U.S./Africa English service to North America Radio Norway International 0000-0200 6055 **GERMANY** Norwegion service to USA 0500-0600 6055 United Nations Radia Bayerischer Rundfunk 0100-0300 7465, 9590 English service to Europe / Africa Africon service 6085 24 hrs. 15265, 17580 0300-0400 7465 2000-2100 9595, 9680 1200-1500 18950 2200-2300 9595, 9680





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The Idiosyncrasies of QSLing Europe

by Gayle Van Horn



Radio I

re you new to the DX scene? Perfect...Europe is an ideal place to begin your DX prowess. European stations usually provide the beginning listener with their initial 25 or 30 stations heard. Program enthusiasts quickly discover that European stations provide some of the most diversified programming in the world. At the same time, despite their reputation as an "easy catch," verifying European stations can be equally as aggravating especially as harder-to-hear parts of the world, when you receive a no-data card or no card at all.

The same rules apply for sending reception reports to Europe – be polite, informative on programming, and be specific in what you want...a verification, please! Within your report ask if any stickers or pennants are available. In return, enclose a souvenir postcard (my favorite) or commemorative postage stamps with your report. Your report may so impress their staff it might even be read in the weekly mailbag show.

Danke Schön Deutschland

Fortunately, despite some financial setbacks, Germany's Deutsche Welle has retained their English broadcast. DW is a favorite among DXers for its powerhouse signals and generous enclosures of free stickers, postcards, and pennants, despite a "no-data" QSL card (except for special occasions or broadcasts). Their informative news magazine, *DW-radio tune-in*, is available online at http://www.dwelle.de.

Domestic broadcasting from Germany provides DXers an interesting alternative. Bayerischer Rundfunk from Munich is the public broadcasting authority for Bavaria.

Südwestfunk, a publicly owned station, transmits from Rohrdorf and is responsible for the Rhineland-Palatinate and southern Baden-Wurttemberg area. Their QSL policy includes a full data card. The pop/rock DJ's format is recognizable even in German.

RFE/RL

Radio Free Europe/Radio Liberty is a United States government funded service, headquartered in Prague, Czech Republic. Both stations share transmission facilities with Voice of America using shortwave transmitters in Germany, Portugal, Spain, and United Kingdom. Neither station broadcasts in English; however, their program-

ming format is easy to follow for reporting. Don't forget to ask for location notation on your verification, as each transmitter site counts as a separate country.

Belgium

Radio Vlaanderen International offers listeners a middle-of-the-road perspective on world affairs, transmitting from five sites. *Brussels Calling* is an excellent magazine show and a good place to begin your reporting. They remain a reliable verifier, and include stickers, cards, pennants and small souvenirs.

Radio-Television Belge de la Communaute Francaise (RTBF) is the broadcasting organization of the French-speaking community in Belgium. RTBF aims at listeners in Africa and consists of relays from RTBF's domestic radio channels. Transmitting via Deutsche Telekom facilities in Jülich, Germany, RTBF is usually verified within a month and accepts English reports. DXers mostly include one dollar and some souvenir postcards.

Dutch Treat!

For over 50 years, Radio Netherlands has treated their listening audience to some of the very best programming on shortwave, broadcasting from Holland, as well as high powered relay stations throughout the world. Thankfully, they have preserved their English service and remain a source few can surpass. Full data verifications are usually received within one-two months, with stickers, program schedules, and hobby related articles.

Viva La France!

Despite cutbacks and lack of a North American English service, Radio France International continues to dazzle their listeners with glitzy programming and an excellent news-oriented service. RFI's colorful cards and station memorabilia will complement your collection.

Moscow loses its Voice

The Voice of Russia, once a powerhouse broadcaster during the Cold War, has been reduced to coping with fewer hours, frequencies, and staff. VOR now QSLs via email, with occasional souvenirs for an exceptional technical report. Consider yourself lucky if you possess any of the former Radio Moscow souvenirs and friendly letters.

BBC and changing times

BBC began its external service in December of 1932 and remains a favorite for its extensive news coverage. Unfortunately, BBC has discontinued providing QSLs (QSL Report. March 1999), as well as other promotional materials, due to budget restrictions. Any QSL card or letter from the BBC should be considered a prize in your collection. However, it might be worth the effort to report an unusual or persistent interference on specific frequencies, which supposedly will be forwarded to the engineers.

It's all Greek to me

Although short on nightly programming, the Voice of Greece continues to please QSL collectors with the sights of a country rich in history and diversity. With one or two enclosed IRCs, your report will be rewarded with views of the magnificent ruins of the Acropolis and the Parthenon. Voice of America's Kavala transmitter site verifies from the Washington, DC, address within weeks.

In Need of a challenge?

Try Iceland! Iceland Radio-Rikisutvarpid, broadcast under the authority of the Icelandic National Broadcasting Service from the capital city Reykjavik. They will accept English reports for their Icelandic programming, and verify with colorful scenery cards, normally within a few months.

SRI...still a hit!

Despite the closure of all but one remaining Swiss transmitter site, Swiss Radio International is still a hit with fans. Worldwide relay outlets assist the global signal, which stresses hard hitting news during the week, and has a decidedly lighter Swiss flair for weekends. Stickers, cards and souvenirs make SRI a keeper.

QSLing European stations continues to be an excellent starting point for beginners, despite their QSL peculiarities. Particularly easy to verify are Radio Austria, Radio Budapest, RAI, Radio Sweden, Spanish National Radio (Radio España) and Vatican Radio. European sites that relay other broadcasters provide an added opportunity to verify European countries. (See the accompany-

ing article by Dave White.)

Stations listed below range from the very easy to those requiring a bit more initiative and persistence.

EUROPE

Current status of station reply enclosures, postal requirements and QSL policy, or response time to be expected if known at press time.

Albania

Radio Tirana (stickers, postcards, \$1.00 requested, slow-poor) External Service Rruga Ismail Qemali Nr. 11 Tirana, Albania

Armenia

Voice of Armenia/Radio Armenia (postcards & stamps, slow-poor) Radio Agency Alek Manoukyan Street 5 375025 Yerevan, Armenia

Radio Intercontinentol Vardononts 28 No. 34 Yerevan 70, Armenia

Austria

Radio Austria International (postcards, stickers, fair-good) Argentinierstrasse 31 A-1040 Vienna, Austrio

Belarus

Radio Belarus International/Radio Minsk (1.00 or one IRC helpful, fair-poor) 4 Krasnaja 4 220807 Minsk, Republic of Belarus

Belgium

(stickers, postcards, one IRC appreciated, very good) Radio Vlaanderen International B-1043 Brussels, Belgium

RTBF International (stickers, brochures, very good) B-1044 Brussels, Belgium

Bulgaria

Bulgorian National Radio 4 Dragan Tsonkov Blvd. 1040 Sofia, Bulgaria

Radio Bulgaria (\$1.00 or one IRC required for postage due to economic cutbacks, slow-irregular) P.O. Bax 900 BG-1000 Sofia, Bulgaria

Radio Varna (one IRC or return postage helpful, very slow) 22 blv. Primorski 9000 Varna, Bulgaria

Czech Republic

(stickers, souvenirs & publications, return postage helpful, fair-slow) Czech Radio Vinohradska-12 120, 99 Prague 2, Czech Republic

Rodio Free Europe/Rodio Liberty (USA address preferred, return postage nat required) Vinohraska 1110 00 Prague 1, Czech Republic

(or:) 1201 Connecticut Ave. N.W. Washington, DC 20036 USA

Denmark

Radio Danmark (\$1.00 or one IRC appreciated but not required, email reports accepted) Radioavisen Rosenorns Allé 22 DK-1999 Frederiksberg C, Denmark

Finland

YLE/Radio Finland (return postage appreciated, email reports occepted, irregular-slow) Shortwave Centre Box 78 00024 Yleisrodio, Finland

Scandinavian Weekend Radio (two IRCs required, email reports accepted) P.O. Box 35 FIN-40321 Iyväskylä, Finland

France

Radio France International (stickers, postcards, souvenirs & publications, return postage not required, good) Boite Postal 9516 F-75016 Paris Cedex 16, France

Germany

Adventist World Radio/The Voice of Hape Postfach 100252 D-64202 Darmstadt Germany

(listener mail should be sent to:)
Adventist World Radio
(stickers, postcards, brochures, return postage
appreciated not required, good-very good)
39 Brendon Street
Londan W1, United Kingdom (see also Italy)

(or:) Adventist World Radio P.O. Box 29235 Indianapolis, IN 46229 USA

Bayerischer Rundfunk (stickers & large program schedule booklet, one IRC helpful or mint postage appreciated, good) Rundfunkplatz 1 D-80300 Munchen, Germany Christliche Wissenschaft (Christian Science)
(bi-monthly via Deutsche Telekom, Jülich, Germany)
see, Shortwave Radio Station Jülich-Deutsche Telekom AG.
Radiosendungen, E. Bethmann
P.O. Box 7330

Radio Croatia/Radio Hrvarska relay (when active) Hrvatski Info Centar/Radio Hrvatska Meduliceva 13 HR-1000 Zagreb, Croatia

D-22832 Norderstedt, Germany

(ar: Technicial) Milan Prezelj Franz-Lenbach-Str.10 D-60596 Frankfurt, Germany

Deutsche Welle (free pennants, stickers, souvenirs & publications, return postage not required, good-very good) Raderbergguetel 50 D-50968 Cologne, Germany

Deutschlond Radio Berlin (English or German reports accepted, souvenirs usually included, fair-slow) Hans-Rosenthal-Platz D-10825 Berlin Shanbera, Germany

Deutchelandfunk (English or German reports accepted, fair-slow) Roderberggütel 40 D-50968 Köln, Germany

Evangeliums-Rundfunk (see Monaco-Trans World Radio)

Good News World Radio via Jülich, Germany (return postage appreciated, very irregular) P.O. Box 805 Fr. Worth, TX 76101 USA

Lutherische Stunde (religious programming ocassionly broadcast over shortwave facilities in Europe. Replies irregularly to English, German preferred) Postfach 1162 D-27363 Sottrum, Germany (or) Clüversborstel 14 D-27367 Sottrum, Germany

Missianswerk Werner Heukelbach (religious programming via Voice of Russia, replies to English & German) D-51702 Bergneustadt 2, Germany

Mitteldeutscher Rundfunk (stickers, souvenirs & brochures, online email form at website, relayed nightly via Bayerischer Rundfunk; accepts English or German, no return postage required, good) Kantsrasse 71-73 Leipzig, Germany

ORB/Ostdeutscher Rundfunk Brandenburg ORB-Fritz P.O. Box 9099000 14439 Potsdam, Germany Overcomer Ministries relay P.O. Box 691 Waterboro, SC 29488 USA

Radio Free Europe/Rodio Liberty (see Czech Republic) 1201 Connecticut Ave., N.W. Washington, DC 20036 USA

Radio Santec (German or English accepted, verified only if QSL requested in report, branch of Universal Life) Marienstrasse 1 D-97070 Würzburg, Germany

Radio Vilnius (via facilities af Deutsche Telekom, Júlich, Germany, see Lithuania)

Südwestrundfunk (German or English accepted, return postage or \$1.00 required, fair-good) Neckkartrosse 230 D-70190 Stuttgart, Germany

SW Radio Station/Deutsche Jülich Telekom (reports vio mail or FAX, Atten: Walter Brodowsky) Rundfunksendestelle Jülich Merscher Höhe D-52428, Julich, Germany

Trans Warld Radio (see TWR Monaco)

United Methodist Church via Jülich, Germany General Board of Global Ministries Atten: Shartwave Broadcast Reports The United Methodist Church 475 Riverside Drive New York, NY 10115

Universal Life/Universelles Leben (stickers, souvenirs, publications. German, English or Spanish accepted, fair-poor) Postfach 5643 D-97006 Würzburg, Germany

Voice of America relay (stickers, return postage nat required, good-very good) 330 Independence Ave., SW Washington, DC 20547 USA

Greece

(stickers, small souvenirs, return postage or one IRC, fair-good) Radiophonikos Stathmas Makedonias/ERT 3 Angelaki 2 546 21 Thessaloniki, Greece

Voice of America relay (stickers, return postage nat required, good-very good) 330 Independence Ave. SW Washington, DC 20547 USA

MONITORING TIMES

Vaice of Greece (return postage nat necessary but appreciated; no taped reports, FAX, regular mail or email files accepted, good-very good) 432, Messogion Av. 153-42 Athens, Greece

Hungary

Radia Budapest (stickers, souvenirs & brochures, return postage appreciated ar one IRC, good) Bródy Sandar utca 5-7 H-1800 Budapest, Hungary

Iceland

Icelandic National Broadcasting-Rikisútvarpid (\$1.00 or one IRC appreciated, fair-good) International Relations Department Efstaleiti 1 IS-150 Revkiavik, Iceland

Ireland

(brochures, one-two IRCs appreciated but not required, good)
Radio Telefis Éireann/RTE Overseas
Broadcasting Developments
RTÉ
Dublin 4, Ireland

Italy

Adventist World Radio/The Voice of Hape (stickers, souvenirs, brochures, good-very good) AWR Europe P.O. Box 383 1-47100 Forli, Italy

(English listeners) AWR 39 Brendon Street Landon W1, United Kingdom

Italian Radio Relay Service (email replies preferred due to postage budget cuts) IRRS-Shortwave Nexus-IBA Caixa Postal 10980 20100 Milana, Italy

Radia Europe (souvenirs for sole, two IRCs ar return postage required) P.O. Box 12 20090 Limito di Piotello Milan, Italy

Radio Maria Network Europe/Spoleto Relay (when active) Via Turati 7 22036 Erba, Italy

RAI International/Radio Roma (stickers, pennants & brochures, one-two IRCs, slow to irregular) External/Foreign Service Centro RAI Soxa Rubra, 00188 Rome, Italy

(or:) P.O. Box 320 Correspondence Sector 00100 Rome, Italy Radio Speranza, Modena (when active; replies regularly to Italian reports) Largo San Giargio 91 41100 Modena, Italy

RTV/Italiana RAI (recommend reports be sent to RAI Rome address, irregular-poor) Domestic Services Radio Uno-Caltanissetta Via Cerde 19 90139 Polermo, Sicily, Italy

Tele Radia Stereo, Roma Via Bitossi 18 00136 Roma, Italy

Lithuania

Lietuvos Radio Sausio 13-osios 10 LT-2044 Vilnius, Lithuanio

Radio Vilnius/Lithuanian Radio (stickers, one-two IRCs oppreciated, slow-irregular) Lietuvas Radijas S. Konarskio 49 LT-2674 Vilnius, Lithuonia

Malta

The Voice of Africa P.O. Box 17 Hamrun, Malta

Voice of the Mediterranear/Radio Melita (stickers & souvenirs, one-two IRCs appreciated, good) St. Francis Ravelin Floriana, VLT 15, Malta

Moldova

Radio Maldova International Maison de la Radio Micrita str. 1 277028 Chissinau, Moldova

(Reception Reports)
(\$1.00 oppreciated, fair-irregular)
RMI-Monitoring Actian
P.O. Box 9972
277070 Chisin u-70, Moldova

Monaco

Trans World Radio (stickers, pennants, brochures, good-very good) Boite Postal 349 MC-98007 Monte Carlo, Monaco-Cedex

Netherlands

(stickers, pennants, souvenirs, brochures; one IRC appreciated, very good) Radio Netherlands P.O. Bax 222 1200 JG Hilversum, The Netherlands

Norway

(stickers, postcards, brochures, one IRC appreciated, good)
Radio Norway International
Utenlandssendingen
NRK. N-0340 Oslo. Norway

Poland

Radio Maryja (see Russia)

Radia Polonia (stickers, postcards & souvenirs, poor-very slow) External Service P.O. Bax 46 PL-00-977 Warsaw, Poland

Portugal

Radio Free Eurape/Radio Liberty (see Germany)

Radio Portugal Internatianol/Radio Portugal (postcards, one-two IRCs appreciated, fair-good) Apartado 1011 1001 Lisbon, Portugal

Romania

(stickers, postcords & pennants, ane-two IRCs appreciated, fair-slow)
Radio Romania Actualitari/ Radio Romania International
60-62 Berthelot St.
(or) P.O. Box 111
70756 Bucharest. Romania

Radio Moldava International (see Moldova)

Russia

Adygey Radio/Radio Maykop (\$1.00 ar one-two ICs helpful, English reports accepted, Russian preferred) ul.Zhukovskogo 24 352700 Maykop Republic of Adygeya, Russia

Amur Radio GTRK Amur per Svyatitelya Innokentiya 15 675000 Blagoveschensk, Russia

Arkhangel'sk Rodio (Russian reports, irregular-poor) GTRK "Pomorye" ul. Popova 2 163000 Arkhangel'sk Arhangel'skaya Oblast, Russia

(or.) U1PR Valentin G. Kalasnikav ul. Suvorov 2 kv. 16, Arkhangel'sk Arkhangel'skaya Oblast, Russia

Bashkortostan Radio (Russian reports, irregular-poor) ul. Gafuri 9/1 450076 Ufa Bashkortostan, Russia

Buryat Radio Dom Radio ul. Erbanova 7 670013 Ulan Ude, Republic of Buryatia, Russia

Chita Radio (when active) ul. Kostushko-Grigorovicha 27 672090 Chita, Oblast, Russia Evenkiyskaya Radia (Russian reports, irregular-poor) ul. 50 let Oktyabbrya 28 663370 Tura Evenkiyskiy Avt, Okrug, Russia

Islamic Wave/Islamskaya Valna (\$1.00 or ane-two IRCs required, Russian reports) Islamic Centre, Moscow Jami Mosque Vypolzov pereulok 7 129090 Moscow, Russio

(or:)Islamskaya Volna, ul. Pyatnittskaya ulitsa 25 133326 Moscow, Russia

Kobordino-Balkor Radio/Radio Nalchik (Russion reports) ul. Nogmova 38 360000 Nalchik Republic of Kabardino-Balkariya, Russia

Kala Atauraya/Voice of Assyria (when active) (\$1.00 or one-two IRCs required, poor-irregular) ul.Pyatnitskaya 25 113326 Moscow, Russia

Kamchatka Radio (when active) RTC Centre Dom Radio ul. Sovietskaya 62-G 683000 Petropavlovsk-Kamchaskaya Oblast, Russia

RTV Centre
ul. Lenina 71
680013 Khabarovskiy Kray, Russia
(or:) Dom Radio
ol.Slavy
682632 Khabarovsk, Khabarovskiy Kray, Russia

Khanty-Mansiysk Radio Dom Radio ul. Mira 7 626200 Khanty-Mansiysk Khanty-Mansyiskiy Avt. Okrug Tyumenskaya Oblast, Russia

Khabaravsk Radia

Koryak Radio ul. Obukhova 4 684620 Palana Koryakskiy Khrebet, Russia

Krasnayarsk Radio (English or Russion reports, \$1.00 or one-two IRCs appreciated) GTRK "Central Russia" ul. Mechnikova 44A, 666001 Krasnayarsk 28 Kradnoyarskiy, Kray, Russia

Magadan Radio/Radio Pacific Ocean (Russian reports preferred, \$1.00 or one-two IRCs) RTV Centre ul. Kommuny 8/12 685013 Magadan, Magadanskaya Oblast, Russia Mariy Radio Mari Yel, ul Osipenko 50 42404 Yoshkar Ola, Russia

Murmansk Rodio Sopka Varnichhnoyo 183042 Murmansk Murmanskaya Oblast, Russia

(or:) RTV Centre Sopko Varnichoya 183042 Murmansk Murmanskaya Oblost, Russio

Perm Radio Permskaya Gosudarstvennaya Telekinorodiokompaniyo ul. Technicheskoya 21 614600 Perm, Permskoyo Oblast, Russia

Radio Maykop/Adygey Rodio ul. Zhukovskogo 24 352700 Moykop Republic of Adygeyo, Russio

Rodio Mix Master (when octive) Office 1, ul. Oktyabr'skoya 20/1 1, 677027 Yokusk, Respublikaakha Sakho, Russio

Radio Nakchik/Kabardina-Balkor Radio ul. Nogmovo 38 360000 Nolchik Republic of Kabardina-Balkariya, Russia

Radio Rossii/Russia's Radio Roam 121 ul.Yamskogo 5-A Polya 19/21 125124 Moscow, Russia

Rodio Samorodinka P.O. Box 898 Centre, 101000 Moscow, Russia

Radio Maryja ul. Zwirki i Wigury 80 PL-87-100 Toruni, Poland

Radiostantsiya Mayak (broadcast via Turkmen Rodio & other services, Russion reports preferred, English occepted) ul. Pyatnitskaya 25 113326 Moscaw, Russio (or:) ul. Akademika Koroleva 12 1277427 Mascaw, Russio

Radiostantsiya Tikhiy Okean (when active) RTV Centre ul. Uborevieho 20A 690000 Vladivostok, Primorskiy Kroy, Russia

Sakha Rodio (stickers, souvenirs and Russian books for sole, English reports occepted) GTRK Respubliki Sokha ul. Ordzhonikidzee 48 677007 Yokutsk, Republika Sakha, Russia Sakhalin Radio GTRK Sakhalin ul. Komsomolskoya 211 693000 Yuzhno-Sakhlinsk Sakhalinskaya Oblast, Russio

Tyumen' Rodio (Russion reports only) RTV Centre ul. Permyakovo 6 6, 625013 Tyumen' Tyumenskoya Oblost, Russia

Voice of Assyria/Kala Atouraya (when active) ul. Pyotnitskoyo 25 113326 Moscow, Russia

Voice of Russia (due to budget cuts, VOR has reduced their mail service considerably, and prefers email reports. If writing by regular mail, please include your email address if you have one. Souvenirs and stickers are occasionally available on request as well as purchases of books and music cossettes.)

ul. Pyatnitskaya 25

Moscaw 113326. Russia

Voice of Tatarstan/Tatarstan Awazy (Russian or English, QSL diplomo program available for two IRCs) QSL Manager P.O. Box 134, Kazan Tatarstan, 420136 Russia

(or:) Ulitsa M. Gorkogo 15 420095 Kazon, Tatarston, Russia

Sicily

Armed Forces Radio/AFRTS Naval Media Center NDW Anacostio Annex 2713 Mirscher Rd., SW Washington, DC 20373-5819

Slovakia

(stickers, pennants, souvenirs & publications, one-two IRCs, fair-good)
Radio Slovakia International
M_tna 1
P.O. Box 55
81755 Bratislava 15, Slavakio

Spain

Radio Free Europe/Radio Liberty (see Germany)

Spanish National Radio/Radio Exterior de España (stickers, pennonts, tourist brochures, one IRC apprecioted, good-very good) Relociones con la Audiencia Sección DX Apartado de Correos 156.202 E-28080 Modrid, Spain

(or:)Apartado de Correos 156.202 E-28080 Madrid, Spain

Sweden

(stickers & pennants, heard over Monaco's TWR; \$1.00 or ane IRC, slaw-irregular, accepts email reports) IBRA Radio/International Broadcasting Association Box 396 SE-105 36 Stockholm. Sweden

Radio Sweden (stickers, postcards, souvenirs for sole, online reception report form, one IRC oppreciated, very good) SE-105 10 Stockholm, Sweden

Switzerland

European Broadcasting Union Case Postal 67 CH-1218 Grand-Saconnex, Geneva, Switzerland

International Telecommunication Union Place des Nations CH-1211 Genevo 20, Switzerland

Mitternachtsruf (stickers, brochures, one IRC oppreciated) Postfach 290 Eichholzsstrasse 38 CH-8330 Pfoffikon, Switzerland

Swiss Radio International (stickers, posters, pennants; souvenirs for sole, one IRC appreciated, very good) Giacomettistrasse 1 CH-3000 Berne 15, Switzerland

Tajikistan

Radio Tajikistan
(English reports to attention of Mr. Ramazonav, with caution if cantacting him via email < nodir@urolnet.ru > as he is charged for incoming/outgoing mail. Enclosures of currency not recommended due to postol theft, personal souvenirs may assist your reply.) Chapaev Street 31
734025 Dushanbe, Tajikistan
(or.) English Service
International Service, Radio Tajikistan
P.O. Box 108
734025 Dushanbe, Tajikistan

Voice of Russia relay (see Voice of Russia)

Ukraine

Radio Ukraine International (stickers & souvenirs, currency or IRCs not recommended due to postal theft, registered mail may ossist your reply, slow-poor) Kreshchotik str.

26, 252001 Kiev, Ukraine

United Kingdom

Adventist World Radio/The Voice of Hope AWR (see Germany for USA address)

BBC World Service discontinued QSLing. Souvenirs, books and videos ovailable for sale only) BBC On Air magazine subscription available.

Bush House, Strand London WC2B 4PH, United Kingdom

FEBA/For East Broadcasting Association (stickers, brochures, return postage not required, good) Ivy Arch Road Worthing West Sussex BN14 8BX. United Kinadom

Globol Sound Kitchen vio Merlin Comm. (see Virgin Rodio) G-One Ltd., 50 Lisson Street London, NW1 5DF United Kingdom

High Adventure Rodia/Voice of Hope P.O. Box 109 Hereford HR4 9XR, United Kingdom

IBC-Tomil P.O. Box 1505 London SW8 2ZH, United Kingdom

Merlin Communications International Limited (does not verify reports) 20 Lincoln's Inn Fields London WC2A 3ES, United Kingdom

Radio Korea Int'l reloy 18 Yoido-dong Youngdungpo-gu Seaul, Republic of Korea

Virgin Rodio via Merlin Comunications. c/o Mr Lee Roberts 1 Golden Squore London WIR 4DJ United Kingdom

World Beacon relay P.O. Box 651525, Benmore 2010, South Africo

Vatican City State

(stickers, postcards, posters, souvenirs for sale, return postage not required, very good) Vatican Radio/Radio Vaticana 00120 Citta del Vaticano, Vatican City State

Wales

Wales Radio International/vio Merlin Comunications. c/o Jerry O'Brien Preseli Radio Productions Pros. Kairon, Crymych Pembrokeshire SA41 3QE Wales

Yugoslavia (Federal Republic)

(when active)
(stickers, pennants, tourist brochures, \$1.00 may
assist reply, unknown when the station will resume
broadcasting, transmitting facility ordered abandoned by Bosnian authorities)
Radio Yugoslavio
Hilendarska 2
P.O. Box 200

11000 Belgrade, Serbia, Yugoslavio



Scanning Roadtrip: Florida-bound

By John Mayson

few months ago we visited I-35 in Texas. This is a major Interstate for commerce as it is part of the NAFTA Highway linking Mexico, the United States, and Canada. This month we're going to visit another important highway, I-4 in sunny Florida, plus other central Florida counties catering to tourists.

I-4 connects Tampa, Orlando, and Daytona Beach. All three communities are popular vacation spots. During the peak of the tourist season, I-4 often is clogged with families traveling between the beautiful Gulf Coast beaches, the Orlando area theme parks, and the famous boardwalk of Daytona Beach.

Unfortunately too often drivers will lose their focus and find themselves in an accident. Monsoon-like summer rains and heavy traffic also contribute to accidents and delays along the central Florida corridor. Emergency personnel race to the scene, not only to tend to the injured, but also get traffic flowing as quickly as possible. Rather than letting the traffic snarls ruin your vacation, take along your scanner and enjoy some great monitoring.

Equipment

Florida is perhaps the most "trunked" state in the nation. South Florida was home to one of the first trunked public safety systems in the country. The state has built a mammoth Motorola Astro trunked system extending from Key West up through Orlando. Virtually every county, city, and town we visit this month uses trunking. With that in mind a trunking capable scanner is a must for monitoring in central Florida. You can scan a trunked system with a conventional scanner, but given the number of users

on every system, scanning them will be more frustrating than the traffic.

Florida's Law Enforcement Structure

At the state level, there are three law enforcement agencies. The most well known and most visible is the Florida Highway Patrol (FHP). The FHP is tasked with patrolling the state's highways and enforcing traffic laws.

The lesser-known agencies are the Florida Department of Law Enforcement (FDLE), the Florida Marine Patrol (FMP), and the Florida Fish and Wildlife Conservation Commission (FFWCC). The FDLE is the state crime investigative unit. FDLE assists local law enforcement with major crimes, performs background checks for firearms purchases, and operates the state crime lab.

The FFWCC is a new agency formed when the Marine Patrol and Game & Freshwater Fish Commission combined. This agency patrols bodies of fresh and salt water under Florida's territorial jurisdiction and enforces boating and fishing regulations, along with enforcing hunting regulations.

Every county has a Sheriff's Office that provides law enforcement to the unincorporated parts of the county and to cities and towns that do not choose to have their own police force. Florida has a standard white and green paint scheme for all sheriffs' office patrol cars in the state.

VOLUSIA COUNTY

Volusia County is home to the "World's Most Famous Beach," a

well-known race track, and sees millions during Bike Week, Beach Week, and spring break. Daytona Beach is by far the most famous city in this county and Deland is the county seat.

Volusia County operates an EDACS TRS.

Volusia County Trunked Radio System EDACS Analog

Daytona Beach System Frequencies

Frequencies	LCN
856.7125	1
857.2125	2
858.2125	3
859.2125	4
860.2125	5
A System Freq	uencies
Frequencies	LCN
855.2125	1
856.7375	2
857.2625	3
858.2625	4
858.7625	5
859.7375	6
860.7125	7
855.7375	8
856.7625	9
857.7375	10
858.7125	11
859.4875	12
860.2625	13
860.7625	14

358.7125	11	
359.4875	12	
360.2625	13	
360.7625	14	
System Fred	quencies	
requencies	LCN	
356.2625	1	
356.9875	2	
357.7625	3	
358.4875	4	
359.7125	5	
360.4875	6	
355.4625	7	
356.4875	8	
357.4875	9	
358.7375	10	
359.2625	11	
359.7625	12	
360.7375	13	
356.9375	14	

		s office fairAffoohs
AFS	Chan	Description
01-061	1	North Dispatch
01-062	2	South Dispatch
01-074	3	East Dispatch
01-065		Teletype
01-066		
01-021		Prisoner Transport
01-022		Courthouse Security
01-025		Judicial Services Division
01-041		SRT
01-042		ERT - Dispatch
01-043		SID-1
01-044		SID-2
01-045		SID
01-047		
01-070		TAC 1
01-071		TAC 2
01-075		TAC 3
01-072		SR
01-147		Citizen Observer Patrol
01-152		Patrol
01-153		Intercity
01-154		Air Channel
01-155		Mutual Aid 1
01-156		Mutual Aid 2
01-157		Mutual Aid 3
09-141	1	Countywide 1
09-142		Countywide 2
09-156		Countywide 1
09-157	2	Countywide 2

Volusia County Sheriff's Office Talkaroups

Volusia Cou	untv Fire-Re	scue Talkgroups
AFS	Chan	Description
02-021		Memorial Hospital - Peninsula
02-022		Memorial Hospital - Ormand
		Beach
02-023		Halifax Medical Center
02-024		Bert Fish Medical Center
02-025		Florida Hospital
02-026		Deland Hospital
02-027		Atlantic Medical Center
02-030		Florida Hospitol/Fish Memorial
		Medical Center
02-037		Hospital

TAC 1 - Dispatch

TAC 2

TAC 3

TAC 4

TAC 5

TAC 6

TAC 7

02-041

02-042

02-043

02-044

02-045

02-046

02-047

02-050

02-051	TAC 9			a Talkgroups			re Talkgroups	859.2375			ORANGE COUNTY
02-052	TAC 10	Training A	AFS 00.021	Description	AFS 03-041	Descrip		859.4625 859.9875			
02-053 02-054	TAC 11 TAC 12	Training B Training C	09-021	Dispatch	03-041	Oispata Tac 1	.n	860.2375			Orlando, one of the
02-054	TAC 12	rigining C	Noltona Po	lice Talkgraups	03-062			860.4625			most popular vacation des-
02-053	TAC 14	Admin	AFS	Description	03-063			860.9625			tinations in the world, is the
02-064	TAC 15	Fire Police	13-061	Dispatch Tac 1	00 000	1000		860.9875			county seat and largest city
02-071		VC Fire	13-062	Tac 2	Ponce In	let Police	Talkgroups	866.1125			of Orange County. Sea
02-081	1	EMS Dispatch	13-063	Tac 3	AFS	Descrip		866.3625			World and Universal Stu-
02-082	2	EMS Dispatch	13-065	Tac All	04-081			866.6125			dios are within the Orlando
02-083	3	EMS Dispatch	13-066	Common	04-082	Cor-to-	car	867.3875			city limits. Disney World is
02-090	TAC			- 11				867.6375			not. Disney operates its
02-091	EVAC 1			e Talkgroups			ilkgroups	868.0375			own private police force,
02-092	EVAC 2	Market And	AFS	Description	AFS	Descrip		868.3125			but all major crimes are re-
02-155	Fire 1	Mutuol Aid	13-070		04-101 04-102	,	ת	Comingle	ounts Ch	eriff's Office Talkgroups	ferred to the Orange County
02-156	Fire 2	Mutuol Aid	13-071 13-076	Admin	04-102	rire Z		Talkgroup		Description	Sheriff's Office.
Volusia Co	unty Rench	Potrol & Lifeguards	13-077	Tac 5	Port Ora	nne Police	· Tolkgroups	600-1	A	Potrol North Zones 1,	
voiosia co	only boaci	Talkgroups	10 0,,	100 5	AFS	Descrip			••	2, 8 3	Orange County Trunked Rodio System
AFS	Chan	Description	Edgewater	Police Talkgroups	07-021			600-2	В	Teletype	Motorolo Type II Analog
12-025	DB-1	Daytona Beach	AFS	Chon Description	07-022		Control	600-3	C	Potrol South Zones 4	Primory System Frequencies
12-035	DB-2	Doytona Beach	08-141	1 Dispatch	07-023		car			8.5	857.4375
		DB-2	08-142	2 Teletype & Toctical	07-024			600-4	D	Potrol South Zones 6	858.4375 859.4375
12-032	DBS-1	Doytona Beach		e	07-025			100 F		8.7	860.4375
10.007	NC0 3	Shores DBS-1		Fire Tolkgroups	07-026		Events	600-5	E	Cor/Cor	866.0500
12-027	NSB-1	New Smyrna	AFS	Description	07-081	Detecti	VØS	600-6	F		866.1375
12.027	NCD 2	Beach	08-101	Dispatch Toc 1	Post Oss	naa Eira 1	alkgroups	600-7 600-8	G H		866.1625
12-036	NSB-2	New Smyrna Beach	08-102 08-103	Toc 2	AFS	Descrip		600-9	i	Longwood Police	866.3875
12-021	OB-1	Ormond Beach	00-103	16.1.2	07-041			600-10	j	congwood ronce	866.4125
12-026	08-2	Ormand Beach	Holly Hill F	Police Talkgroups	07-044		,,,	600-11	ĸ		866.6625
12-023	00 1	Sheriff - Common	AFS	Description	07-045			600-12	ï		866.6875
12-030		Beochwoy (toll-	08-061	Dispatch				600-13	M		866.8500
		booths)	08-065	Talk	South D	aytona Pa	lice Tolkgroups	600-14	N		866.8875
12-031		Beachwide			AFS	Chon	Description	600-15	0		866.9125 867.1625
				ire Tolkgroups	05-081		Dispatch				867.3500
		Talkgroups	AFS	Description	05-082		Toctical			re-Rescue Talkgroups	867.5500
AFS		Description	08-041	Dispatch	05-083	3	Cor-to-car	Talkgroup	Descri		867.6000
11-061		Mainland Beaches	Laka Walaa	Police Talkarouse	Courth D	meana G	re Talkgroups	100-1 100-2	Dispat Tolk	(II	867.8000
11-062 11-063	2	Tactical		ı Police Talkgroups Description	AFS	uy:ona ri Descrit		100-2	Fire To	c1	867.8500
11-065		Teletype		Dispatch		Dispate		100-4	Fire To		868.1000
11-071		Direct	12 001	e reporter	05 .0.			100-5	Fire To		868.1250
11-106	Narc 2		New Smyrr	na Beach Police Talkgroups		PMIN	NE COUNTY	100-6	ICS 1		868.2625
11-107	Narc 3			Chon Description			OLE COUNTY	100-7	ICS 2		868.2875 868.5750
11-110	Narc 4			1 Dispatch		C t	ala in Elanidata	100-8		Pork Hospitol	868.6375
11-111	Narc 5	c	06-002				ole is Florida's	100-9		cal Services	868.8250
11-115		Special Events	06-003				county, which	100-10 100-11		ency Services	868.8750
14-001 14-002		Mainland Beaches	06-004 06-005	4 SPN			tly as a suburb o. Seminole's	100-11	COLUIN	bia Pork Medical Cen-	******
14-002	3	Toctical	00-003				y, Sanford, now	100-12	South	Seminole Community	Winter Garden System Frequencies
14-004	4	Teletype	New Smyrr	na Beach Fire Tolkgroups			mational airport	100 12	500111	Hospital	866.3125
14-005		Special Events		Description			ainly to charter	100-13	Florido	Hospital Altamonte	867.1375
14-010		Event Traffic	06-041	Dispatch			m Canada and			•	867.8875
14-011		Special Events - Traf-	06-051	Ops .	Euro		iii Cuiiada aiid			Police Talkgroups	868.1375 868.3500
fic cor to c	10.						ole operates a	Talkgroup			868.6000
D 4 D	l. ft . T			olice Talkgroups		rola T		000-2	Dispot	ch	000.0000
AFS AFS	Beach Fire T Descripti		AFS 12-121	Description Dispatch				Cosselberry	Police T	olkaroups	Winter Pork System Frequencies
11-041	Dispatch		12-121	vispuicii	Seminol	e County	Trunked Radia System	Talkgroup			866.0875
11-053	Tolkarou		Oronge Cit	y Police Tolkgroups	Motorolo	ı Type ili	Analog (s0, s4, s4, s4,	000-3	Dispat		866.3375
11 030	10110100			Description	s4, s5, s	12)					866.6375
Daytona B	Beach Shore	s Police Tolkgroups	05-061		_			Lake Mary	Police To	lkgroups	867.1875
AFS	Descripti		05-062		Frequen			Talkgroup			868.7500
04-061	Dispatch				851.38 851.43			000-7	Dispat	ch	Orlando System Frequencies
04-062	Channel	2		y Fire Tolkgroups	855.48			6 (10	b T 18		866.1125
04-066				Description Discounts	856.23			Sonford Po			866.2375
Dolard D.	dica Talkan	uiDC	05-021 05-022	Dispatch Fireground	856.43			Tolkgroup 300-1	Descrip Potrol	mon	866.3625
AFS AFS	olice Tolkgro Chan	ops Description		riregrouna Special Events	856.46			300-1	Potrol		866.5750
Ars 09-061		Dispatch	A7-079	Shorini Facilis	857.23			300-2	1 01101		866.6125
09-062	2	- Aportor	Ormond Re	each Police Tolkgroups	857.46	25		300-4			866.7125
09-063	3		AFS	Description	857.98			300-5			866.7375
			03-021	Dispatch	858.23			300-6			867.0750
			03-022	Teletype	858.46			300-7			867.2125 867.2375
			03-026		858.987	J		300-8			GUI ÆGI J
			03-027	107-01-10-				300-9			

867.3250		2480 Fire 13 Supply	POLK COUNTY	1168 Tac 5	HILLSBOROUGH COUNTY
867.3875		2312 Fire 14 Supervisors	- FOLK COURT	1200 Tac 6	HILLSBOKOUGH COUNTY
867.6875 867.7125		2544 Fire 15 Unit-to-Unit	Polk is one of the larg-	1232 Tac 7	Tampa is the county
867.7375		Eatonville Palice Talkgroups	est counties in Florida. It's	1264 Tac 8	seat and principal city of
868.0375		Talkgraup Description	bounded by metro Tampa	Polk County Fire-Rescue Talkgroups	Hillsborough County.
868.2125		12048 Dispatch	to the west and metro Or-	Talkgroup Chan Description	Hillsborough wraps around
868.2375			lando to the east. Bartow is	2416 Fire Dispatch	the eastern half of Tampa
868.3125		Maitland Police Talkgroups	the county seat and Lake-	2448 Tac 2	Bay and also includes the
868.6625 868.7125		Talkgroup Description	land the largest city. As	2480 Tac 3	super structure section of
868.9125		11824 Tac 1 11856 Tac 2	Tampa and Orlando have	2512 Toc 4	the Sunshine Skyway
000.7123		11030 1402	grown, Polk has grown up	2544 Tac 5 2576 Tac 6	Bridge that spans the mouth
Maitland S	ystem Frequencies	Ocoee Palice Talkgroups	with them. While a little off	2640 Ops 1	of Tampa Bay.
866.2000		Talkgroup Description	the beaten path, Cypress	2672 Ops 2	Popular sites in
866.5375		14448 Tac 1	Gardens and Bok Tower Gardens remain worthwhile	2704 Ops 3	Hillsborough include
868.5250		14480 Tac 2		2736 Supervisors	Busch Gardens, Adventure
868.7750		Orlando Polico Tollonosco	tourist destinations, espe-	2768 Admin	Island, the Florida
Oranne Co	unty Jail System Frequencies	Orlando Palice Talkgroups Talkgroup Description	cially to those hoping to escape the sometimes suf-	2/00 fuc p:	Aquarium, and Ybor City.
866,1625		8368 East Patrol	focating crowds of the ma-	2608 EMS Dispatch	Tampa still relies on their tried and true conven-
866.8000		8208 East Teletype	jor theme parks.	Polk County Public Safety Talkgroups	tional VHF and UHF radio
867.1000		8688 East Emergency	Lakeland has operated	Tolkgroup Chon Description	systems. The county re-
867.4125		8304 West Potrol	a Motorola TRS for years	2800 1 Ops 1	cently abandoned their
		8240 West Teletype	and very recently Polk	2832 2 Supervisors	VHF frequencies for an
	unty Sheriff's Office Tolkgroups	8272 West Emergency	County switched to a	2864 3 Admin	EDACS trunked radio sys-
Talkgroup Description	Sector	8336 Central Patrol	Motorola TRS.	FI 41 44 4 6 1 7 11	tem (TRS).
2576 1	Northwest Potrol	8624 Central Teletype 8560 Central Emergency		Florida Highway Potrol Talkgroups	
2608 1	Toc 1	8400 Car-to-cor	Polk County Trunked Radio System	Talkgroup Description 33232 Dispatch	Hillsborough County TRS
2643 1	Teletype	8496 Watch Commanders	Motarola Type II Anolog	33264 Tac	Frequencies in LCN order
2672 1	Cor/Cor	8528 Chonnel 11	Construct Contract Construction	00201	1 = 866.3750
2704 1	Speciol Ops	8592 Chonnel 13	Frostproof System Frequencies 866.1875	Lakeland Trunked Radio System	2=866.7000
2736 1	Service	8656 Service	866.6000	System Frequencies	3 = 867.9125 4 = 868.2750
2768 2 2800 2	Eost Patrol	9264 Signal 43	868.1500	Motorolo Type II Analog	5=868.6000
2835 2	Toc 2 Teletype	Orlando Fire Talkgroups	868.4000	Form and the	6=868.8250
2864 2	Cor/Car	Talkgroup Chon Description	868.8000	Frequencies 852.3625	7 = 866.1250
2896 2	Special Ops	8080 Toc 1 Dispatch		852.7125	8 = 866.4125
2928 2	Service	8112 Tac 2 Fireground	Indion Lakes System Frequencies	853.7125	9=866.7250
2960 3	West Patrol	9104 Tac 3 Fireground	866.0750 866.3250	854.3625	10 = 866.2500
2992 3	Tac 3	9136 Tac 4 Investigations	866.7750	854.7125	11 = 866.5625 12 = 866.8125
3027 3 3056 3	Teletype Car/Cor	13328 Tac 7	867.5750	855.2375	13=867.3125
3088 3	Special Ops	Winter Garden Police Tolkgraups		855.7375	14 = 868.2500
3120 3	Service	Talkgroup Description	Lokeland System Frequencies	856.7625 857.7625	15=868.5750
3152 4	South Patrol	12592 Toc 1	866.2750	858.7625	16=867.0375
3184 4	Tac 4	12624 Toc 2	866.6250 867.1250	859.7625	17 = 868.1000
3219 4	Teletype		867.3750	860.7625	18 = 868.3000 19 = 868.6875
3248 4	Cor/Car	Winter Park Police Talkgroups	867.6250		20 = 867.6500
3280 4 3312 4	Special Ops Service	Tolkgroup Description	867.7750	Lakeland Palice Talkgroups	20 - 007.0300
3344 5	1-Drive/Disney Patrol	10448 Tac 1 10480 Tac 2	867.8250	Talkgroup Chan	Talkgroups
3376 5	Toc	10512 Tac 3	868.0500	Description 816 1 North Dispatch	Hillsborough County Sheriff's Office
3411 5	Teletype	10544 Toc 4	868.3250	848 2 South Dispatch	02-021 Dispatch District 1
3440 5	Car/Car		868.5500 868.8500	880 3 Talk	02-022 Street Crimes District 1
3472 5	Special Ops	Winter Park Fire Talkgroups	000.0300	912 4 Detectives	02-023 Information District 1 02-041 Toc District 1
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2096	Fire 1 Dispatch	4272 Orlando Regional Medical Center	867.8750	Talkgroup Chan	02-027 Dispatch District 3
2128	Fire 2 Unit-to-Unit	4336 Sand Lake Hospital	Polk County Sheriff's Office Talkgroups	Description	02-030 Street Crimes District 3
2160	Fire 3 East	4368 Florida Hospital Orlando	Talkgroup Chan Description	1296 1 Dispatch	02-031 Information District 3 02-042 Tac District 3
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453.875r	6	East Tactical
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-042	Tac 2		856.96				3	Flarida Highway Patrol
-043	Tac 3		857.23			15008		Florida Highway Potral Su-
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The Worldwide Shortwave Listening Guide

Edited by John Figliozzi

state's Motorola Astro TRS

has halted and the state has

chosen rival Com-Net

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Fresh water & game en-

Simplex Unit-ta-Unit

forcement





Beginner's Corner

Ken Reitz, KS4ZR ks4zr@firstva.com

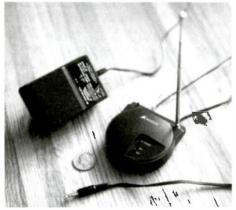
Beginner's Project: Wireless Whole House Audio

early six years ago, in my Satellite TV column, I described how to distribute satellite audio throughout your house with the use of a small stereo FM transmitter. This is a great do-it-yourself project all SWLers, hams, and scanner listeners can really use. It's easy, it's cheap and you'll wonder why you hadn't thought of this before. So, now it's time to update this project and introduce it to the thousands of new MT readers who never saw the original piece.

◆ A Little Background

This whole project started many years ago when I was trying to listen to satellite delivered audio in different parts of the house. My only option was to run speaker wire to every room in the house attached to speakers with volume controls. The drawbacks were that the system was inflexible and would run into a lot of money, to say nothing of the arduous task of running wires through the attic and walls. I had to be able to do this without wires and cheaply.

Then came a catalog in the mail featuring a device to use in the car which broadcast the output of a personal CD player to the FM band of the car radio. A light went on in the attic! It was basically a battery powered miniature FM stereo transmitter with a small wire attached which would plug into the output of the CD player. It had a small six inch telescoping whip antenna, an on/off switch, and a tiny LED to indicate when the unit was on. Best of all, it cost less than \$20. It was perfect.



The original FM transmitter with its 3 volt AC adapter power supply. Look for units with telescoping whip antennas to give best coverage.

To use it in the house I slipped two AA batteries inside, attached an adapter to the plug so that it would fit into the output of the 1/4" headphone jack on front of the stereo amplifier I was using. Following the instructions which came with the unit I found a relatively unused frequency on the FM band, tuned the transmitter to that frequency and went around the house with a portable FM radio to see how reception was.

It worked like a champ. At the time I was listening to KLON-FM Long Beach, a public radio jazz station from California, on Galaxy 5 transponder 2, and sure enough there it was in each room. I walked outside and was surprised to be able to hear the little transmitter around the entire perimeter of the house. What a treat to be able to sit out on the deck with a portable radio and listen to KLON from a distance of three thousand miles!

◆ The Down Side

Not long after I put the transmitter into action, a serious problem developed: this little transmitter was power hungry. A new set of AA's wouldn't last two days on a 24 hour use basis and barely a week when judiciously turning the unit off when not in use. Because the battery drained fairly quickly, the transmitter tended to drift off frequency which made long term listening difficult because of having to adjust the radio's tuning to follow the drift of the transmitter.

The solution was an outboard power supply. The first one I tried lacked proper filtering which induced an annoying hum in the audio. The next one, with proper filtering, did the job. I'm happy to report that this little FM transmitter and power supply has been in continuous service for six years without incident. It's fun to listen to satellite delivered AC-3 audio from DMX Music/Direct on the Bose Wave radio via this little gem.

What's happened in the meantime has been the disappearance of these particular models. Many similar units are still available (some still under \$20), but in an effort to reduce production costs most no longer have an external antenna and, consequently, their range is dramatically reduced. After all, these units really need only transmit a few feet to be picked up by car radios. However, I've found that if you haunt the consumer electronics and major discount stores you'll find someone still selling a unit with an outside telescoping antenna. Circuit City

is one store which carries a brand which should work quite well for this project, and Radio Shack carries filtered adapters for the voltage required (see materials list below).

Getting It All Together

In addition to your transmitter and power adapter you'll need two alligator clips with rubber covers and a 20-ft 1/8-in stereo headphone extension cord. To convert the transmitter to wall plug delivered DC, cut the plug off the end of the adapter (make sure it's not plugged into the wall), determine which of the two wires is positive (+); there may be a white stripe down the length of that wire. In the case of adapters without indicators you'll need to use a small Volt/Ohm meter to determine the polarity of each wire.

Separate the two wires and strip off a quarter inch of insulation on each lead. Slip the plastic alligator insulators down each of the wires and solder the bare wire ends to each of the clips. Stick a pencil into the squeezed open clips and slide the plastic insulator over the clips, remove the pencil.



Soldered alligator clips take the place of batteries and provide drift-free long term operation. Imagine the number of batteries I'd have gone through in the last six years!

Now, take the cover off the battery compartment on the transmitter and with a pen knife make a notch on the end of the cover where the adapter wire will feed into the battery compartment. Inside the battery compartment you'll see two terminals, one for negative (-) and one for positive (+). You may have to screw a very small screw into the terminals to make something the clip can bite into. Clip the alligator clips to the proper terminals, slip the battery cover back in place and plug it into an AC outlet. If there's an on/off switch and LED, turn the unit on and ascertain that it's operating.

Attach the transmitter's input plug to the female end of the 20-ft 1/8-in stereo headphone

extension cord and plug the male end into your audio source. Locate a quiet frequency on a portable FM radio and tune the transmitter (this is usually done with a screwdriver) until you

hear the audio source coming through the portable FM radio. Tune the transmitter slowly because it's easy to zip right passed the listening frequency. These units are usually factory set at a predetermined frequency and most are not capable of transmitting across the entire FM broadcast band.

If you're satisfied that the transmitter is tuned properly make sure the an-

tenna is pulled out as far as it will go and set the transmitter as high as you can on a shelf (that's the reason for the 20-foot headphone extension cord). I have mine at about the seven foot level.

Circuit City

Sound Feeder/

Audio Adapter

Model SF 120.

Wireless

As with all transmitters, the higher you place the transmitting antenna, the greater your coverage area. This is where the transmitters without external antennas don't work as well. Coverage is usually within only a few feet, making them useful only as CD adapters for the car. Still, if you're willing to do a little more work you may be able to get inside the unit and add an external antenna to improve coverage on units without antennas. That procedure is beyond the scope of this beginner's project.

FM Listening Fun

This is a great way to be able to listen to your favorite shortwave radio programs any where in the house. I sometimes monitor the local 2 meter repeater this way. You can plug in your scanner, CD player, satellite audio - you name it! These units are FCC approved when used unmodified and provide just enough output to be heard within your own property. However, if you use this unit in a condo or apartment setting it's possible that your small signal can be picked up by others who may not be interested in listening. If your transmitter interferes with licensed broadcasters you'll have to shut it down. In most suburban settings these transmitters won't make it past your curb.

There are other FM transmitters, including kits* on the market, which would accomplish the same task, but I find these are considerably more expensive and require more expertise than most of us have. Besides, I like the off-the-shelf advantage this unit has: it's already built, it's

cheap (total project cost about \$50), very easy to put into operation, and has worked flawlessly for years. There aren't many electronic gadgets about which you can say the same thing!

Materials for this project:

- · Miniature FM Stereo transmitter with telescoping antenna: Circuit City Wireless sound feeder/audio adaptor from Arkon Resources, Inc. model # SF120 \$25. (http://www.circuitcity.com)
- AC adapter with hum filter: R. S. Cat. # 273-1752 (1.5 v) or #273-1755 (3 V) \$14.
- Headphone extension cord: R. S. Cat. # 42-2460 \$6
- Alligator clips: R.S. Cat. # 270-1545 \$3

*Advanced experimenters may want to try Rainbow Kits new FM Stereo Transmitter Kit which can be tuned from 76-108 MHz and claims a transmitting range of 200 feet. This product is available from your local Radio Shack store by special order or by mail order at 800-THE-SHACK. Cost is \$30 plus shipping and uses a 9v battery which is not included. This is not considered a "beginner's" project. Soldering skills and testing equipment are required.









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RadioMap

Transmitter sites in your area are researched and marked on a beautiful 11 x 17 full color plot. See FCC licensed sites from VLF beautiful 11 x 17 full color plot. See FCC licensed sites from VLF through microwave plus selected FAA transmitter stee. Callaigns, frequencies, and names provided. Ham radio stations excluded. You choose the map center location - anywhere within the United States. We adjust map coverage for best readability, Deluxe report includes additional index by frequency and local spectrum occupancy chart. Used by radio professionals and hobbyists since 1994 for identifying towers, sources of radio signals, interference, etc. Send nearest street intersection for map center and check for \$29.95 or \$39.95 (Deluxe report) payable to Robert Parnass.

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Ask Bob



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Even More on Radar Speed Detectors

In a previous column, one of our readers suggested that frequency drift is self-canceling in police radar speed detectors. Bill Bowers disagrees, noting that the equation for determining speed is based on the actual frequency being transmitted. Bill does agree, however, that a slight drift would be inconsequential – an X-band radar gun would have to be 60 MHz off to produce even a 1% error!

♦ More on the NEXTEL "Walkie-Talkies"

In our previous column we expressed surprise that NEXTEL phones could be used as two-way hand-held transceivers. Responses from our readers were most interesting, including this information from sharp-eyed readers John Mayson and Butch Way:

Nextel uses Motorola iDEN radiotelephones running a maximum power of 600 milliwatts for the handhelds, and 3 watts for the base/mobile units. Each unit can be configured as a cell phone, a two-way radio, or both. They also have alpha paging and Internet capabilities, and operate in the 806-821 (handset)/851-866 (base) MHz range (non-cellular).

Nextel sites are linked by T1 telephone lines and cover several states ("corridors"); their digital modulation scheme is proprietary and trunk-tracking scanners cannot receive the transmissions. Their intercommunications range is limited to their service area, outside of which they are useless as a two-way radio. Like most digital communications, they're either very clear and crisp, or totally inaudible.

Thanks, John and Butch, for this most informative look at the NEXTEL system.

Q. I use a discone in my attic for 800 MHz reception. I recently added a bag phone antenna in my radio room below; is it likely to have improved signal strengths? (Dave Macci, e-mail)

A. Nope. Since you already have a high discone, in order for you to enjoy another 3 dB gain (very small improvement), you would have had to add another discone (or equivalent antenna), spaced at least 1/2 wavelength apart (easy to do at 800 MHz) at the discone's location or higher. Since all you added was a small whip at a lower and more shielded location in the residence, I doubt that you are getting more than 1 dB gain or so, if that. Not enough to count.

In fact, from certain directions, it's likely that you are getting signal cancellation when the signal strikes the two antennas out of phase.

Q. I'm currently incarcerated in a federal prison which uses the new narrow-band trunking system. With a PRO-91 scanner, would I be able to hear their communications? (Name withheld)

A. Narrow band refers to the bandwidth required to convey the modulation (deviation) on the FM signal. Channels are now spaced at 12.5 kHz intervals in the federal UHF band, and while a scanner can be programmed for all those frequencies, your PRO-91 won't track the 406-420 MHz trunking system, and even if it could – or if you manually scanned their channels – the Bureau of Prisons utilizes Digital Voice Privacy (DVP) on their new Motorola Astro systems, so all you'd hear would be noise.

Q. I am a football coach. Football in the South is holy and a coach must win however possible. During the game the opponent coaches talk from the sideline to the press box using a UHF digital phone conference call system; it's spread spectrum and changes frequencies 90 times per second. Can I intercept this signal and convert the digital to audio for me to hear and give me the edge need to defeat this team? (Name withheld)

A. While I understand your fervor to intercept the calls, there are no digital-to-analog decoders in commerce because they would be illegal under the descrambler prohibitions of the 1986 Electronic Communications Privacy Act (ECPA '86).

Q. I just got back from a vacation in Orlando, Florida, and noticed while driving along I-95 and I-4 that there were motorist call boxes along the side of the interstate

every so many miles. Are these boxes telephones or are they two-way radios? If so, what frequency would they operate on and would they come under the privacy act about monitoring them? Do they connect direct with the Florida HP? (Morris, Wilmington, NC)

A. These call boxes are two-way, full-duplex radiotelephones operating in the 72 and 453 MHz ranges. They have been in place for nearly 30 years and communicate directly with communications consoles at Florida Highway Patrol stations. With the proliferation of CB radios and cell phones, they are rarely used nowadays. There are probably no laws against listening to them because they aren't connected to a wireline service and they aren't scrambled.

Q. I note that my old Yaesu FRG7 and FRG7000 receivers both have a "Wadley loop" design. I can't find this in any of my electronics dictionaries; what is it? (Dick Kruse, Seattle, WA)

A. The very first portable, synthesized, short-wave receiver made for the consumer market was the XCR-30, made by the Barlow Wadley Company of South Africa in the early 1970s. It was a cutting-edge design by Dr. Trevor L. Wadley, using a phase-locked-loop (PLL) drift-canceling technique he developed during World War II. The receiver covered 500 kHz-30 MHz.

The first well-known commercial use of the Wadley loop was in the 1950s as implemented in the (British) Racal RA-17 receiver, followed by the RA-117 into the early '70s.

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

Bright Ideas

Getting Started

Gary Webbenhurst ab7ni@arrl.net

I recently bought the popular Radio Shack book, *Police Call 2001*. I thought I would pass along some tips and ideas for really getting your money's worth out of this fine publication. These ideas could be used in many other hobby reference books. Our Canadian and overseas readers must rely on other sources. I would be happy to publicize them if you'll send me the info.

I consult my *Police Call* book many, many times. This soft cover publication will soon fall apart if you do not take some precautions to protect the book. First,

I bend back the front and back covers on the preformed spine line. I use scotch tape to reinforce the cover edges and along the spine. I then cut a clear plastic sheet protector and slide it over the front cover. Ditto for the back. Again, scotch tape will seal the deal.

Don't overlook the obvious.
Read the inside front cover.
Memorize the types of systems and types of radios: e.g.,
MOB (mobile or handheld ra-

dios) vs. MR (a repeater output). The EMS paramedic frequencies (462-463 MHz) at the bottom of this page are used throughout the U.S.; are they programmed into your scanner? Do you understand everything in the *Listening Guide* on pages 6-31? In fact, everything in the front of the book is worthy of reading (and rereading).

Learn how to decipher what you see when you look up your favorite agencies. Observe which frequencies share a common callsign. Often this

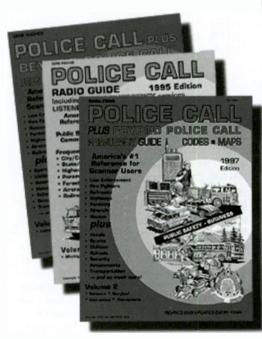
shows one frequency as a MR or other repeater output. The other frequency with the same callsign is often the input and will have units under the MOB category.

This can also be a tie-in to other agency use. Look for all the frequencies that have the same number of MOB units. If the fire department has 50 mobiles on the "F" channels, look for the same number under other headings, especially the "L" listings.

I make a photocopy (just one for my own use) of the pages containing the info for my favorite agencies. On this photocopy, I draw lines from one frequency to others that are linked by virtue of a common callsign or number of MOBs. I literally "map" out the system in use.

In the past few years many agencies have migrated from low and high VHF to UHF or 800 MHz trunked systems. Who is using those old frequencies?

They may still be in use by the original agencies. Example: the Brookings, South Dakota, Sheriff had long ago switched from 39 MHz to 453.600. Nevertheless, I was rewarded one night when I heard the deputies use the old 39.08 channel for car to car chitchat. Clearly, they had no idea anyone would still be listening on the old, almost forgotten frequency. They also moved the local ambulances over to the unused 39.100, even thought it was licensed as a "P" frequency. California grabbed several of the 39 MHz channels for their updated CHP repeater system.



There are about a dozen key pages that I often use. For quick reference, I mark them with Post-It® Note/Flag markers. (The 3M pack # 673 TG1 is very

handy!) I also use a fluorescent highlight pen if I find something interesting. You can also use the highlight pen to mark the outer edge of a page. I simply apply the pen to the very outside edge of the page and let the ink absorb into the page. A visual thumb shortcut!

I love to use *Police Call* to play the role of detective in my scanning activities. In the Spokane, WA, area, they use every available high band fire frequency

from 153.755 to 154.445. Well, almost: Who is using 154.235 and 154.265? I have these plugged into the scanner but never hear a thing. They are licensed to nearby counties, and I can only guess they are used as simplex fire ground channels. The local fire frequencies are given names, e.g. Green, Blue, Red, etc. I have also heard reference to the "Gray" channel. Any Eastern Washington readers out there have a clue? I love this game: Always new challenges!

The "Frequencies listed by FCC Radio Service" can be interesting late night reading. Of special interest is the Automotive Emergency Radio listings. These 150 and 452 MHz frequencies have often been reassigned for public safety use. So where are the tow trucks? They might still use these, but many are now on "business"

The "Beyond Police Call" can produce some gems. Look under the heading for Ambulances & Rescue Crews. College security/police depart-

frequencies in the 461-469 range. See the

next idea.

ments can be found under the heading; College & Universities. This section is worthy of a page by page inspection. Oh yeah, those tow trucks are listed here, too.

If you have updates, corrections, or new information, please forward the info to the good folks at *Police Call*. Their regular mail and email

address can be found on page 32.

If you live near a state line, you might have to travel to a nearby city to buy the correct version of *Police Call* for that region. Or, you can buy the CD

version, which includes the info for all 48 states.

Next month, we take a look at tips and ideas to maximize your use of the *Police Call* 2001 and other FCC database CD ROMs.

Scanning Report

The World Above 30 MHz

Richard Barnett ScanMaster@aol.com

Michigan Monitoring

im Pavich writes: "I would like to share some scanner frequencies with you for your 'Scanning Report' department in Monitoring Times. Possibly some of your readers in the Michigan, Wisconsin, and Minnesota area would be interested. During the past 12 years I've been vacationing in the Upper Peninsula of Michigan. I have been scanning a variety of interesting stations across the U.P. from casino security to maximum security prisons. Most of my stops have been in the eastern, northern, and northwest part of the U.P. It is interesting listening to all of the action around the Mackinac Bridge and Mackinac Island...Scanning in the U.P. of Michigan has provided many hours of enjoyment over the past few years. Here is my list of stations:"

Eastern	U.P./Northern	L.P.
---------	---------------	------

155.2500	Mackinac Island
453.9500	Mackinac Bridge
155.4900	Mackinac County Police
42 5900	State Police

42.5800 State Police
42.7400 State Police
155.3100 Chippewa County Police
155.5350 Chippewa County Police

456.1000 Chippewa County Police (link?)

456.1750 Chippewa County Police (link?)

155.9100 St. Ignace Police 154.0550 St. Ignace Local G

154.0550 St. Ignace Local Government 158.8500 St. Ignace Police

128.3250 Mackinac Area Flight Weather 460.5250 Mackinac Hospital

155.3400 Area Emergency (HEAR) 154.3100 Cheboygen County Fire

39.1400 Cheboygen, Petosky Police 39.4800 Cheboygen County Police

39.4800 Cheboygen County Police 39.6800 Cheboygen, Petosky Police

39.8200 Cheboygen County Police

154.9500 Charlevoix County Police 159.0900 Lake City Police

155.6850 Emmet County Police

156.2100 Rogers City Police 155.5650 E. Jordan Police

155.7750 Sault Ste. Marie Police

155.4150 Sault Ste. Marie Police

155.7450 Newberry Police 463.9250 Casino Shuttle

154.5400 Cosino Security

Munising, Marquette County 154,1000 Munising Police

42.5800 Munising State Police
155.4300 Ishpeming, Negaunee Twp., Champion Police

155.7150 Negaunee Police
155.9100 Marquette, Negaunee Police
155.7750 Marquette County Police
155.6100 Marquette County Police
154.9500 Dickenson County Police
42.2400 Marquette State Polcie

154.9800 Marquette County Local Government 155.1000 Marquette County Local Government

Baraga, Houghton, Kewanaw County

42.5800 State Police 42.7400 State Police

155.7600 Houghton Police

155.4150 Houghton, Kewanaw County Police

155.4900 Greenland Ontanagon County 155.0850 Baraga Prison

462.1375 Ojibwa Casino

Thanks, Jim.

Final Preview of the BC780XLT

This is our final installment of our BC780XLT preview. By the time this article appears the BC780XLT will have been on the market for a while, so many of you will have reached your own conclusions about the radio. We would appreciate your passing on your comments to this editor (at scanmaster@aol.com) or the new scanner editor who will be starting in this post shortly.

This month we'll cover the Motorola trunking features of the radio. Uniden, of course, began the trunk-tracking phenomena in the mid-90s with the Bearcat 235 portable which tracked Motorola trunking. Since that time, they've followed up on their success with the introduction of the BC-895 base scanner and the BC-245 portable (which combine Motorola and Ericsson trunktracking). The BC-780XLT is another leap forward in Motorola trunktracking by Uniden for a number of reasons. Let's look at each new feature one at a time.

◆ Control Channel Trunking

This is perhaps the most significant and exciting new feature in the BC780XLT. In all previous trunking scanners you've been required to enter all the repeater output frequencies used in a Motorola trunked system in order to be able to monitor all the talkgroup communications therein. This scheme has worked very well and allows Uniden radios to present a real-time display of activity on the system

through the repeater-activity indicator bars.

On the other hand, there are problems with requiring all system channels to be programmed: First, if you don't know which working (voice) frequencies go with a particular control channel, you're out of luck. Most public safety systems have been fully vetted, so it hasn't been much of a problem. You can find information on all these systems on the web or in *Police Call*.

Business systems have been more of a problem. For several reasons it's actually fairly difficult to discern from the FCC databases how frequencies are comprised within a business trunked system. Furthermore, if any system adds frequencies, with the standard trunk-tracking method it would be difficult to determine that a new channel was added, not to mention what the actual channel is.

The BC-780XLT allows for standard control and voice channel programming of a Motorola system as well as for Control Channel Only trunking. In Control Channel (CC) only mode, the user need only program a Motorola control channel into memory and then set the bank for CC-only mode trunking through the Trunk Menu. Once you set the radio for normal trunk scan or search, the radio will look for a control channel in the appropriate bank (you can set it for up to 10 systems as you have 10 banks in the radio), lock on the control channel and begin trunking away. As the system switches to a voice channel as assigned by the control channel, you will actually see both a talkgroup number and the working channel frequency.

With this feature, you'll be able to determine all the working channels that correspond to the control channel. You can alpha tag talkgroups that are active during CC-only trunking, store them in Scan Lists, lock them out, assign fleet maps to Type 1 control channels, etc. You will not get a visual display through the trunking channel activity indicators, however, of system activity.

There is one new wrinkle to consider. While most systems will use what is known as the "default frequency plan," there will be some 800 MHz systems that do not. The "plan" refers to the scheme that is used to determine frequency assignments from the control channel. Depending on whether 12.5 kHz splits are used (as opposed to 25 kHz), and/or whether frequencies are used between 866 and 869

MHz, you will need to assign, through the Trunk Menu, the appropriate frequency plan. The BC780XLT owner's manual lays out how you make the determination. It's really simple and again, only will be necessary in limited cases.

A few other notes on control-channel only trunking: No plan will be needed for 900 MHz systems. CC-only trunking is not available for VHF and UHF systems. CC-only is not available for EDACS or LTR systems due to the nature of their operation (it's not a limitation of the scanner itself).

♦ VHF/UHF Trunking

Uniden has upgraded VHF and UHF trunking capabilities for the BC780XLT by providing for additional programming parameters as compared to the BC245XLT. When programming such systems you are asked in the 780 to program a base frequency, a spacing frequency and an offset channel. There are defaults for these settings and various web sites provide data for the few public safety and numerous federal and military VHF and UHF trunked systems which use settings other than the defaults. Uniden also goes one step further in allowing for the programming of up to three sets of base, spacing and offset frequencies (this will be critical in Australia where three sets are used and we're sure more U.S. systems will also have this requirement in the future). More spacing options are also available as well (any multiple of 5, 7.5 and 12.5 kHz).

◆ I-CALL

With the BC780XLT, you will, for the first time, be able to track I-CALL (otherwise known as "Private Call") communications in a trunked system between two radios. Most communications in a trunked system are "talkgroup" communications where, for example, a dispatcher communicates with a number of mobile units in the field. The dispatcher may only be addressing an individual unit, but all the units within the group monitor the conversation. In an I-CALL, one unit, such as a police sergeant may decide to contact an individual officer to discuss a recent event. The sergeant would enter the radio number of the unit he wishes to call and that communication will only be heard by the two units involved. The communication will trunk just like a talkgroup call, and the 780 will track it. Note that as discussed in a previous article, this feature is also available in Ericsson EDACS

There are a number of ways to operate I-CALL tracking on the 780:

A. I-CALL in Trunk Search Mode (settings are made through the Trunk Menu)

- OFF: In search mode, the default setting is off. Here the 780 will perform just like other trunking scanners and will track only talkgroups.
- 2. ON: With 1-CALLs set to "On" in Trunk Search, the scanner will track both talkgroup and 1-CALL communications.
- 3. ONLY: In the I-CALL Only mode the scanner will search for

and follow all 1-CALL communications found on the system (you can obviously only monitor one at a time). Talkgroups calls will be ignored. You can also enter this mode on the fly by pressing the decimal and then the search key at anytime.

Once you've begun to monitor an I-CALL you can press HOLD to follow the conversation. Usually (but not always), both individual unit IDs within the call will flip-flop back and forth on the screen. Sometimes only one of the IDs will appear, but you will hear both sides of the conversation.

B. I-CALL in Trunk Scan Mode

- If you find a conversation that you like, or if you wish to monitor all the I-CALLs of a particular unit ID, you can enter that ID into Scan List memory. Individual unit IDs in Materiala trunktracking appear with a 7 as the first digit and they can be programmed into memory.
- 2. You can also program "All I-CALLs" into Scan List memory. To do this, step to an open Scan List memory position and enter either "decimal, O" or you can enter (for Motorola) 700000. If you don't have over 90 talkgroups programmed into memory, we would suggest assigning Scan List 10 as your I-CALL List and then you can turn off "All I-CALLs" by deselecting a single scan list. With your scanner programmed in this manner, you can monitor your favorite talkgroups and follow all I-CALL communications at the same time.

One final note about Motorola I-CALLs. At times interconnect calls may slip through and appear as I-CALLs. Interconnect calls will not trunk. They of course are monitorable on any non-trunked scanner as well.

Other Features

There are other aspects of Motorola trunking which are interesting and which have

been made available in prior Uniden-built scanners. These include the ability to "toggle the status bit" and the ability to change to using squelch as a command to return to the control channel. Neither of these features is critical and the default settings should suffice for almost all users.

Alpha Tags, Scan Lists and More

You can, of course, assign a 16-character alpha tag to any programmed talkgroup. Additionally, you can program a bank alpha tag which can be used to identify the trunked system programmed into a particular bank (this appears in Trunk Search mode). Furthermore, for Scan Mode, you can assign a Scan List tag to the 10 Scan Lists available per system (each of the 10 scan lists allows for up to 10 memory positions for a total of 100 per system). For example, you may wish to show:

Smithfield FD-1 Davis Cty. Fire

Besides alpha tagging a talkgroup, you can also flag any talkgroup in Scan List memory for a Beep Alert (a rapid triple beep will sound at the start of each transmission on the talkgroup to alert you to a conversation of interest). You can also flag any talkgroup in Scan List memory for external recording.

That wraps it up for our feature discussion of the Uniden Bearcat BC780XLT. For more information on this exciting new scanner, check out the official web site for the radio at http://www.bc780xlt.com.



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U.S. NOAA Weather Radio Stations and Frequencies

Courtesy of the National Weather Service

logstaff	WXK76 WWG41	162.400 162.425	100 100	Hagstaff Phoenix	NWR Transmitter	Call	Freq	Watts	NWS Programming Office					
WR Transmitter	Call	ARIZO	Watts	NWS Programming Office		KHB47 	162.550 DELAW	500 IARE	New York	NWR Transmitter Guam (Nimitz Hill)		Freq 162.400	Watts 375	NWS Programming Off Guam
ekorkona 'ellville	WWG54	162.500	1000	Shreveport Little Rock	NWR Transmitter Hartford Meriden New London	Coll WXJ41 WXJ42	162.475 162.400	Watts 300 500	NWS Programming Office Boston New York			GUA	.M	
Star City Jewarkana	WXJ54 WXJ49	162.400 162.550	1000	Little Rock	NWD Transmitter	Call		111-41-	ARMS D	Waynesbora	WXW88	162.425	375	Columbia
Russellville	WWF96	162.525	1000	Little Rock			CONNEC	TICUT		Waycross	WXK75	162.475	500	Jacksonville
Aountain View	WXL66	162.450	1000	Little Rock						Valdosta	WXM79	162.500	100	Greenville/Spartanburg Tallahassee
ittle Rock	WXJ55	162.550	1000	Little Rock	******	-1/4HU/	104.47 3	100	OCCUPANT!	Thomaston Toccoa	WXU31 WWH24	162.500 162.425	1000 250	Atlanta Grannilla/Saadaahuu
anesboro	WXJ51	162.550	1000	Memphis	Mray	WXM87	162.400 162.475	300 100	Denver Goodland	Sumerville	WXJ72	162.450	300	Atlanta
art Smith Surdon	WXJ50 WXJ48	162.550 162.475	1000	Tulsa Little Rock	Pueblo Sterling	WXM52 WXM53	162.400	100	Pueblo	Svavannah	KEC85	162.400	1000	Charleston
ayetteville	WXJ52	162.475	1000	Tulsa	Mead/Longmont	WXM51	162.475	100	Denver	Pelhom	WXK53	162.550	500	Tallahassee
WR Transmitter	Call	Freq	Watts	NWS Programming Office	La Junta	WWG23	162.500	100	Puebla	Metter	WWH25	162.425	1000	Charleston
		_			Greeley	WXM50	162.400	100	Denver	Mocon	WXK71	162.475	1000	Atlanta
		ARKAN	IDA)		Grand Junction	WXM55	162.550	300	Grand Junction	Jesup	WXJ28	162.450	300	Jacksonville
		ADVAN	1080		Glenwood Springs	WWG43	162.500	100	Grand Junction	Columbus	WXM32	162.323	1000	Birminghom
					Fowler	WWG44	162.425	100	Pueblo	Cleveland	WXJ53	162.525	200 300	Atlanta Atlanta
					Fort Collins	WXM92	162.330	100	Denver	Buchonan Chatsworth	WWH23 WXK52	162.425 162.400	1000	Atlanta
Winfield	WWF53	162.525	1000	Birminghom	Denver	KEC76	162.550	330	Pueblo Denver	Brunswick	WWH39	162.425	300	Jacksonville
Tuscaloosa	KIH60	162.400	1000	8irmingham	Boyero Colorado Springs	WWH32 WXM56	162.450 162.475	100 100	Denver	Brasstown Bald	IXI22	162.500	100	Atlanta
Montgomery	KIHSS	162,400	1000	Mobile Birmingham	Bethune	WWF77	162.525	100	Goodland	Boxdey	WXM65	162.525	350	Jacksonville
Mobile Mobile	KIH56 KEC61	162.475 162.550	1000	Birminghom Mobile	Alamosa	WXM54	162.475	100	Puebla	Augusta	WXK54	162.550	500	Columbia
lackson Louisville		162.500	1000	Mobile	NWR Transmitter	Call	Freq	Watts	NWS Programming Office	Atlanta	KEC80	162.550	500	Atlanta
Huntsville	KIH20 WWF55	162.400	1000	Birminghom	AHAM Y	- "				Athens	WXK56	162.400	500	Atlanta
Ft. Payne	WWF44	162.500	1000	Birminghom			COLUM	ULDU		Americus	WX130	162.425	1000	Atlanta
Flarence	KIH57	162.475	1000	Birminghom			COLOR	ADO		NWR Transmitter	Call	Freq	Watts	NWS Programming O
Dozier	KIH59	162.550	800	Mobile					*					
Demopolis	WXL72	162.475	1000	Birminghom	Strawberry Peak	WXM66	162.500	100	San Diego			GEO	(GIA	
Cullman	WWF66	162.450	100	Birmingham	Santa Barbaro	KIH34	162.400	330	Los Angeles			676)CIC	
Birmingham	KIH54	162.550	1000	Birmingham	Santa Barbara Mo		WWF62		5100 Los Angeles					
Aubum	WWF54	162.525	1000	8irminghom	Santa Ana	WWG21	162.450	100	San Diego	West Palm Beach	KEC50	162.475	500	Miami
Anniston	KIH58	162.475	1000	Birmingham	San Luis Obispo	KIH31	162.550	330	Los Angeles	Venice	WWG59	162.400	1000	Tampa Bay
NWR Transmitter	Call	Freq	Watts	NWS Programming Office	San Francisco	KHB49	162.400	500	San Francisco	Tec Table Key	WWG60	162.450	125	Key West
					San Diego	KEC62	162.400	330	San Diego	Tampa	KHB32	162.550	1000	Tompa
		ALAB/	AMA		Socramenta	KEC57	162.550	330	Sacramenta	Tallahassee	KIH24	162.400	1000	Tampa Bay Tallahassee
					Redding	WXL88	162.550	100	Sacramento	Sebring	WXK83A	162.425 162.500	1000 110	Tallahassee
					Pt. Areng/Ukigh	KIH30	162.550	500	Eureka	Pensocola Salem	KEC86 WWF88	162.400	500	Mobile
Yokutat	WXK69	162.400	1000	Yakutat	Monterey Marine	WWF64	162.550	100 100	San Francisco San Francisco	Panama City	KGG67	162.550	1000	Tallahassee
Wrangell	WXJ83	162.400	750	Juneau	Monterey	KEC49	162.550 162.550	500	Los Angeles	Orlando	KIH63	162.475	1000	Melbourne
Voluez Whittier	IX129	162.400	300	Anchorage	Grass Valley Las Angeles	WWF67 KW037	162.400	100	Socramenta	Ocala	WWF85	162.525	250	Jacksonville
Voldez	WXJ63	162.550	500 500	Anchorage Voldez	Fresno Green Volley	KIH62	162.400	330	San Joaquin	Naples	WWG92	162.525	1000	Miami
Jordania Unalaska	WXK89	162.550	300 300	Anchorage Anchorage	Eureka	KEC82	162.400	330	Eureka	Miami	KHB34	162.550	1000	Miomi
Seword Soldatna	KEC81 WWG39	162.550 162.475	330	Anchorage Anchorage	Coachella	KIG78	162.400	100	San Diego	Melbourne	WXJ70	162.550	1000	Melbourne
Nome Sound	WXJ62	162.550	500	Name	Bakersfield	WXL89	162.550	100	San Jooquin	Live Oak	WW630	162.450	300	Jacksonville
Kodi Nama	WXJ78	162.550	100	Kodiak	NWR Transmitter	Call	Freq	Watts	NWS Programming Office	Key West	WXJ95	162.400	1000	Key West
Ketchikan	WXJ26	162.550	500	Annette						Jacksonville	KHB39	162.550	1000	Jacksonville
Juneau	WXJ25	162.550	500	Juneau			CALIFO	KNIA		Inverness	WWF38	162.400	350	Tompa Bay
Homer	WXJ24	162.400	800	Anchorage			CALIFO	DMIE		Goinesville	WXJ60	162.475	1000	Jacksonville
Haines	WXM97	162.400	100	Juneau						Fort Pierce	WWF69	162.425	1000	Melbourne
Fairbanks	WXJ81	162.550	500	Fairbanks	Yuma	WXL87	162.550	100	Phoenix	Fort Myers	WXK83	162.475	250 1000	Tallahassee Tampa Bay
Craig	10(180	162.475	300	Annette	Window Rock	WWF99	162.550	100	Flogstaff	Daytona Beach East Point	KIH26 WWF86	162.400 162.500	1000	Melbourne
Cordova	WXJ79	162,400	500	Valdez	Tucson	WXL30	162.400	100	Tucson		WWH20	162.450	1000	Tallahassee
Biorka Island	WXJ80	162,550	500	Juneau	Show Low	WXK76A	162.400	100	Flogstaff	Bethlehem	WXM58	162.400	300	Miomi
Anchorage	KEC43	162.550	125	Anchorage	Prescott	WWF98	162,525	100	Flogstaff	Belle Glade	Call	Freq	Wotts	NWS Programming (
NWR Transmitter	Call	Freq	Wotts	NWS Programming Office	Phoenix	KEC94	162.550	300	Phoenix	NWR Transmitter	C-II	r	187 - 14-	1810C D : 0
					Heliogroph	IXI24	162,550	100	Tucson					
					OLOGILZ LOUK	10(123	162.525	100	HOOSTOTT			LILUI		
		ALAS	SILA		Greens Peak	MVIDD	1/2 525	100	Flagstoff Flagstoff			FLOI	MA	

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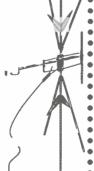
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US Air Force Global HF System

he United States Air Force operates the busiest military radio system on high frequency "shortwave," the band between 3 and 30 megahertz (MHz). It's GHFS, the Global High Frequency System. It serves a wide number of military stations, most using upper-sideband (USB) voice.

♦ History and Mission

GHFS was born on June 1, 1992, when the Air Force consolidated its HF radio networks. Most of it came from the "Giant Talk" net used by the disbanded Strategic Air Command, and from the servicewide Global Command and Control System (GCCS).

The resulting GHFS went through some minor, evolutionary changes. It never changed its mission, however. This is still published regularly by the US Department of Defense (DoD) in its *Flight Information Handbook*:

"The US Air Force Global High Frequency System is a worldwide network of 13 high-power HF stations, which provide air/ground HF command and control radio communications between ground agencies and US military aircraft and ships. Allied military and other aircraft are also provided support in accordance with agreements and international protocols as appropriate. The USAF Global HF System is not dedicated to any service or command, but supports all authorized users on a traffic precedence basis."

"General services provided by the Global HF System are general Phone Patch and Message Relay Services, HF Radio Teletype (HF RTTY) and Data Support, Command and Control Mission Following, Emergency Support, Broadcasts, HF Direction Finding Assistance, and ATC support."

GHFS can be a real catch-all. Authorized users come from all US military branches, and occasionally from other nations and alliances which have made agreements for service. The US Navy has abandoned its old High Command (HICOM) net for Global, and the Army is occasionally heard as well. Army landing craft and barges are especially good catches.

By far the heaviest users, though, are transports and air-refueling tankers in the Air Mobility Command (AMC). The transports usually identify with the static callword "Reach," as in "Global Reach," plus a tail or mission number. It's very common for Reach aircraft to make phone patches to weather and operations offices

for arrival arrangements and general safety of flight.

The RTTY they mention used to be common, but this requirement has very recently been dropped as unsupportable, and digital modems will take over. The "Broadcasts" mentioned are EAM, the high-priority "Emergency Action Messages" that send coded orders throughout the US military on all channels. On GHFS, these usually have a 6-character preamble, and the word "standby."

"Direction finding" refers to an emergency procedure of calling up a locating station to "fix" the location of a lost aircraft or a jammer, and "ATC support" refers to Air Traffic Control, also an emergency relay procedure. Under all normal conditions, military flights use the same civil ATC nets as scheduled airliners.

♦ Frequencies and Calls

GHFS frequencies are in two groups: published and discrete. Published frequencies are the big calling channels, currently 4724, 6712, 6739, 8992, 9025, 11175, 11181, 13200, 13212, and 15016 kilohertz (kHz), nearly always upper-sideband voice (USB). Busiest are 8992 ("Eight-Niner") and 11175 ("Triple-1"), which most stations guard around the clock. The others operate on a schedule which changes twice yearly, on the first of April and October.

9025, 11181, and 13212 kHz are relatively new frequencies, guarded only by Lajes, a station in the Azores Islands west of Portugal. That bleeping on 9025 is Automatic Link Establishment (ALE), a computerized system that simplifies HF operation. Old frequency lists will show 8968 and 17976, but these were removed from GHFS service two years ago.

The general callword "Mainsail" is used by stations entering this net, as an all-stations or "CQ" call. Recently, some GHFS stations changed names, though voice callsigns haven't caught up yet. "Andersen" is now "Guam." "McClellan," near Sacramento, CA, is "West Coast." DoD publications are vague on Hickam, near Honolulu, sometimes calling it "Hawaii." For a few months after Andrews Air Force Base, MD, became a remote control point, these local identifiers all vanished, but they have since come back.

The Air Force Eastern Test Range network, which becomes busy during missile and Space Shuttle launches from Cape Canaveral, is considered a GHFS backup. Cape Radio can be

heard on its primary frequency of 10780 kHz, and a newly listed secondary of 20390.

Global stations also maintain a large number of "discrete" frequencies, where traffic will be moved for lengthy communications. There are a lot of these. Fortunately, the frequency and possibly a secondary will be given over the air when the ground station sends somebody there.

Modernization

Much has been made of Scope Command, the huge Air Force program to update all equipment used by GHFS and others. It has been repeated in the hobby press that this plan somehow replaces GHFS, or merges it into a huge net with all the other high-power services. While Scope Command will definitely affect the way we listen to the Air Force, neither of these statements is true. All of these nets continue their present identities and missions.

Scope Command is designed to standardize all of the Air Force's far-flung HF stations into something that can finally be supported cheaply and effectively with off-the-shelf components. The acronym "Scope" stands for "System Capable Of Planned Expansion." "Command" refers to the merger of several earlier schemes, such as "Scope Signal" and "Scope Control" into one big plan.

The "Planned Expansion" has been going on in phases since the initial \$350 million contract went to Rockwell/Collins in 1995. Currently, "Phase 1" is complete, giving all GHFS stations new, authoritative-sounding radios with many advanced bells and whistles. "Phase 2" is due for completion sometime after 2002. At that time, the entire Global will be remotely controlled from a new facility, the Centralized Net Control Station (CNCS) at Andrews Air Force Base in Maryland.

This remote capability, called "Lights Out" in Air Force jargon, moves most of the human operation of the Global to Andrews. Already, we have heard Croughton Global, in England, stand-down its radio watch amid great ceremony and publicity. However, smaller staffs remain at all these stations for maintenance and occasional local operation. They're not going away either.

Advanced Uses

Scope Command has gotten bigger a couple of times, mostly at the hands of the Air Mobility Command, which currently is not only the system's major user but its primary installer.

The first large addition was the Automatic Link Establishment capability. The goal here was and is to make HF phone patches as simple and automatic as dialing through a satellite, but at a far lower cost. Designers talk fondly of "God-Furnished Equipment," namely the ionosphere.

ALE doesn't replace GHFS either, but it does change it somewhat, adding a whole new set of frequencies, capabilities, and acronyms for utility fans to learn. It is perhaps the most complicated communication system ever devised, coming from a military standard many hundreds of pages long. However, a lot of work has gone into making it completely transparent to the user, not to mention kind of fun.

What we hear is a distinctive gurgling sound, sometimes followed by phone calls or voice traffic on the same frequency. The ALE part can be decoded by PC-ALE, a freeware program for IBM/Windows compatible computers. It's not hard to build up nice logs from the "soundings" made by Global stations and aircraft as they automatically update their internal databases of the best calling channels for one another.

More recently, the AMC asked for, and got, four million dollars to add an HF e-mail system to Scope Command. This is, potentially, another big money saver. It allows computers to "inject" files into NIPRNET, the DoD's Non-Classified Internet Protocol Router Network. Ultimately, file transfers will go from "desktop to cockpit," saving yet more satellite time.

We end this month's column with a correction from January. The National Hurricane Center's international weather identifier is, of course, KNHC, not KHNC. Don't know how that one got by. See you next month, back with the usual big log.

Global High Frequency System Schedule

(Revised December 2000)

H24: Continuous S: Summer (April-September) W: Winter (October-March) Frequencies are kHz, Times are UTC (Coordinated Universal Time).

4724

Andrews (S 0430-0930, W 0200-1230)
Ascension (S 2400-0700, W 2400-0700)
Croughton (S 2230-0400, W 1800-0800)
Elmendorf (S 1000-1300, W 0230-1900)
Guam (S 1300-2000, W 1200-2030)
Hickam (S 0900-1600, W 0800-1700)
Incirlik (H24)
Lajes (S 2230-0400, W 1800-0800)
Offurt (S 0600-1100, W 0300-1400)
Salinas (S 0300-1000, W 0200-1100)
Thule (W only H24)
West Coast (S 0730-1300, W 0500-1530)
Yokota (S 1200-1930, W 0930-2200)

6712

Andrews (S only 0230-0930) Ascension (S 2400-0700, W 2400-0700) Croughton (S only 2230-0400 Guam (W only 2400-1230) Lajes (S 2230-0400, W 1800-0800)

6739

Ascension (1900-2400)
Elmendorf (5 0800-1400, W 0030-2130)
Guam (5 1100-2000, W 1000-2030)
Hickam (5 0700-1600, W 0600-1700)
Incirlik (H24)
Salinas (5 0100-1000, W 2400-1100)
Offurt (5 0400-1100, W 0100-1400)
Thule (W only H24)
West Coast (5 0530-1300, S 0300-1530)
Yokota (5 1000-2130, W 0730-2400)

8992

Andrews (H24)
Ascension (H24)
Croughton (H24)
Elmendorf (H24)
Guam (H24)
Hickam (H24)
Offurt (H24)
Salinas (H24)
Thule (H24)
West Coast (H24)
Yokota (H24)

9025

Laies (S 2230-0400, W 1800-0800)

10780

AF Eastern Test Range: Cape Canaveral Antigua Ascension

11175

Andrews (H24)
Ascension (H24)
Croughton (H24)
Elmendorf (H24)
Guam (H24)
Hickam (H24)
Incirlik (H24)
Salinas (H24)
Offurt (H24)
Thule (H24)
West Coast (H24)
Yokota (H24)

11181

Lajes (\$ 0400-2230, W 0800-1800)

1320

Andrews (S 0930-0430, W 1230-0200)
Croughton (S 0400-2230, W 0800-1800)
Elmendorf (S 1300-1000, W 0800-1800)
Guam (S 2000-1300, ₩ 2030-1200)
Hickam (S 1600-0900, W 1700-0800)
Offurt (S 1100-0600, W 1400-0300)
Salinas (S 1000-0300, W 1100-0200)
Thule (S H24)
West Coast (S 1300-0730, W 1530-0500)
Yokato (S 1930-1200, W 2200-0930)

13212

Lajes (S 0400-2230, W 0800-1800)

15016

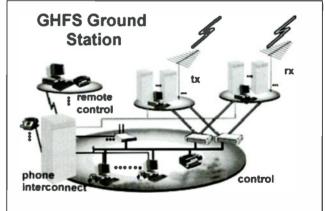
Andrews (S 0930-0230, W 1230-2400) Ascension (0700-1900) Croughton (S 0400-2230, W 0800-1800) Elmendorf (S 1400-0800, W 0800-1800) Guam (S 2000-1100, W 2030-1000)
Hickam (S 1600-0700, W 1700-0600)
Incirlik (H24)
Lajes (S 0400-2230, W 0800-1800)
Offurt (S 1100-0400, W 1400-0100)
Salinas (S 1000-0100, W 1100-2400)
Thule (S only H24)
West Coast (S 1300-0530, W 1530-0300)
Yakota (S 2130-1000, W 2400-0730)

20390

AF Eastern Test Range: Cape Canoverol Antigua Ascension

GHFS Ground Stations

(AFB = Air Force Base, AB = Air Base) Voice Identifier ALE Location Andersen GUA Andersen AB, Guam Andrews ADW Andrews AFB, MD HAW Ascension AB. S. Atlantic Ascension Croughton AB, England Croughton CRO Elmendorf AFB. AK Elmendorf AED Hickam HIK Hickom AFB, HI Incirlik TAG Incirlik AB. Turkey Laies PLA Lajes Field, Azores McClellan MCC Near Sacramento, CA Offutt OFF Offutt AFB, NE JNR Salinas, Puerto Rico Salinas Thule AB, Greenland Thule GTL Yokota JTY Yokota AB, Japan



Additional ALE Ground Stations in Network:

GVT E-Systems Test Facility, Greenville TX

JDG Noval Support Facility Diego Garcia, Indian Ocean

OKC Tinker AFB, OK

OKV Civil Air Patrol, Winchester, VA

RIC Civil Air Patrol Tech Center, Richmond, VA

RSC Rockwell/Collins Service Center, Dallas, TX

WRL Warner-Robins AFB, GA

ALE Scan Frequencies

(kHz, all USB) 2805.0 3059.0 3137.0 4721.0 5708.0 7632.0 9025.0 6715.0 6721.0 8965.0 9057.0 11226.0 11250.0 13215.0 15043.0 18003.0 20631.0 23337.0 27870.0



Utility Logs

Hugh Stegman

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ABBREVIATIONS USED IN THIS COLUMN

ALE Automatic Link Establishment AM Amplitude Modulation ARQ **Automatic Repeat Request teleprinting system** CAMSLANT Communication Area Master Station, Atlantic CIA US Central Intelligence Agency CW Continuous Wave (Morse telegraphy) DX Distant Transmitter **E**5 CIA English female "numbers," counts 1-0 E10a Israeli English "numbers" with "2" in callup EAM **Emergency Action Message** FAX Radiofacsimile **FEC** Forward Error Correction teleprinting system FEMA Federal Emergency Management Agency ID Identifier M8 Cuban CW "numbers, " ANDUWRIGMT far 1-0 **MARS** Military Affiliate Radio System **Pactor** Packet Teleprinting Over Radio Puerto Rico RSA Republic of South Africa Radio Teletype RTTY SHARES Shared Resources United Kingdom UK Unid Unidentified US **United States**

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 (see feature article in this issue).

- 1888.0 IPD-Civitavecchia Radio, Italy, with weather in Italian at 1910.
 (Patrice Privat-France)
- 1890.0 TFA-Reykjavik Radio, Iceland, with a phone patch at 2240. (Privat-France)
- 2600.0 IQQ-Mazara del Valla Radio, Italy, with a weird English computer voice followed by weather in Italian, at 0147. (Ary Boender-Netherlands)
- 2810.0 OFK-Turku Radio, Finland, with navigotional warnings at 2240. (Boender-Netherlands)
- 3299.0 YCLR- Probably Ukrainian military, with CW callup to "HNBG," then traffic, at 2052. (Boender-Netherlands)
- 4215.5 OXZ-Lyngby Radio, Denmark, with FEC traffic list, then announcement that this telex service would close on 31 December, at 2330. (Day Watson-UK)
- 4426.0 CAMSLANT-US Coast Guard, VA, working cutter Vigorous, at 1807. (Duke Rumley-NC)
- 4555.0 Unid-Top frequency of 1-per-second pulsed carrier sweeping up from 4567, at 0126. (Tom Sevart-KS) [This is one of several US experimental oceanic observing sensors. The users are aware that they have an interference problem. –Hugh]
- 5170.0 SYN-Israeli Intelligence (E10a) with abnormal callup NR2ZEC5 for hours, changed to SYNM2 at 0325, then SYN2 at 0330 (John Maky-AR)
- 5230.0 CIO8-Israeli Intelligence (E10a), abnormal callup repeated for hours after 0145. (Maky-AR)
- 5399.6 GANTSEC-US Coast Guard, Greater Antilles Section, PR, working stations on this new frequency, also some scrambling heard, at 0232. (Ron Perron-MD)
- 5403.0 AAR3NAA-US Army MARS, DE, appointing a MARS Region 3 representative to contact FEMA on 5211 and 10493, at 1514. (Perron-MD)
- 5418.0 English female "numbers" voice, callup "506" at 0200, then into repeated 5-number groups at 0210. (Camillo Castillo-Panama) [Probably Russian and transmitted from Cuba. –Hugh]
- 5696.0 Coast Guard Rescue 2131, telling CAMSLANT they see a strobe in the water, at 2131 (Rick Baker-MI)
- 5800.0 Sled Dog-US Military, working Sun Burst at 0553 (Jeff Haverlah-TX) 5810.0 CIA "Counting Station" English format (E5), AM callup to "204,"

- several days at 0200. Same station, with AM callups to "400," two different days at 0300. Same station, AM callup to "132," at 0301. (Castillo-Panama)
- 5841.0 Herk 17-US Coast Guard HC-130, calling Panther on the "Bravo" frequency, no joy, at 2326. (Perron-MD)
- 6449.7 PWX33-Brazilian Navy, Brasilia, with RTTY warnings at 0422. (Bob Hall-RSA)
- 6671.0 Lifter 99-US Air Force C-17, calling Turbo 82, a tanker, no joy at 0018. (Perron-MD)
- 6881.0 NNN0MUA-US Navy/Marine Corps MARS, in a Pactor message system with NNN0WPT at 2128. (Mid-Atlantic DXer-MD)
- 7470.0 VLM-Casey Meteorological, Antarctico, with weather FAX (120/576) at 1901 and 2251. (Watson-UK)
- 7635.0 High Voltage-Net control in probable US Marine Corps exercise, working Lancer 03 and Fighting Tiger 202, at 2030. (Rumley-NC) Chieftain-Probably the same exercise, having a squabble with Head Cap 46 and 49, US Civil Air Patrol, over whose frequency it was. Finally Head Cap 45 showed and canceled that day's CAP Chaplains' Net, at 2200. (Perron-MD)
- 7664.0 RIW-Russian Navy, trading CW signal reports with CMU967, at 2026. (Boender-Netherlands)
- 7685.5 Unid-US Navy/Marine Corps MARS, Pactor traffic list at 2200.
- 7784.0 Unid RTTY relay of US Air Force KAWN, Aviation Weather Network, at 0030. (Sevart-KS)
- 7844.0 Khabarovsk Meteorological, Russia, synoptic weather chart FAX (60/576), at 0736. (Watson-UK)
- 8167.0 TWA 891-Trans World Airlines flight, patching Maintenance via Stockholm to report a right-side hydraulic failure, at 2340. (MADX-MD)
- 8400.0 Padilla3-Colombian Navy vessel, ALE sounding at 0329. (MADX-MD)
- 8980.0 US Coast Guard 1717, in a patch via CAMSLANT to Panther (Bahamas anti-drug), went back to primary 8983, at 2311. (Perron-MD)
- 8983.0 US Coast Guard Rescue 1720, reporting a distressed vessel at 2213.
 "D-3-F"-US Coast Guard aircraft on probable drug operation, working CAMSLANT at 2300. (Perron-MD)
- 8992.0 Misnamer-US Military with EAM, simulcast on 11244, at 1906. (Haverlah-TX)
- 9025.0 Lajes-US Air Force, Azores Islands, North Atlantic Ocean, with an EAM on their new Global frequency, at 0224. (Perron-MD)
- 9153.0 Cuban cut number station (M8), CW callups and 5-figure groups, three different Saturdays at 1203. (Castillo-Panama)
- 10608.0 Atlantico, Colombian Navy headquarters, calling vessel Espada, in ALE at 2327. (MADX-MD)
- 11175.0 Zapper 21-US Military, calling Bookshelf, no joy at 1758. (Haverlah-TX)
- 11200.0 Milole-Gabon Railways, Africa, ALE sounding at 1610. Mboungou-
- Gabon Railways, ALE sounding at 1631. (Watson-UK)
 11250.0 Andrews-US Air Force, MD, working Offutt, NE, in voice and ALE
- at 1351. (Perron-MD) 12481.5 ELYC9-Vessel Navigator Saturn, working VIP76 in ARQ, at 1040.
- (Watson-UK)
 12584.0 VIP76-Globe Wireless, Perth, Australia, working vessel Navigator
- Saturn in ARQ, at 1040. (Watson-UK)
 13530.0 CESYP- Colombian Navy Special Command, working CALDAS33
- in ALE and voice, at 1742. (MADX-MD) 14396.5 AFA3HY: SHARES Coordination Station, KS, taking weekly check-
- ins at 1700, switching to ALE at 1709. (MADX-MD)
- 14481.7 Rffbbpm-French Military, Paris, with ARQ messages to Rfgwda and many others, at 1600. (Hall-RSA)
 16806.5 NRV-US Coast Guard, Guam, with FEC weather at 1545. (Hall-
- RSA)
 17080.0 UAI3-Nakhoda Radio, Siberia, Russia, with CW markers at 2227.
 (Ken Maltz-NY)
- 17441.5 5YE-Nairobi, Kenya, with RTTY weather at 2210. (Maltz-NY)
- 19131.0 Atlas-US Drug Enforcement Agency, IA, working aircraft "411" at 1930. (MADX-MD)
- 19530.2 FJY2-French government, Port-aux-Français, Kerguelen Islands, with RTTY "fox" markers at 1735. (Maltz-NY)
- 20179.8 Rfviflr-French Navy frigate Floreal, with ARQ messages to Rfvic and many others, at 1625. (Hall-RSA)
- 22550.2 MGJ-Royal Navy, Faslane, UK, with channel stotus messages in RTTY at 1620. (Maltz-NY)



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Digital Digest

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HF Fax Facts

nlike many of the RTTY-based press and weather services that have long since migrated to satellite, facsimile (or fax for short) has fared somewhat better over the past decade. Many stations can still be heard, from the US to Australia, sending pictures of press reports, weather or sea conditions. The gear needed to receive these pictures is also modest, and pictures appear in around five to ten minutes.

How Does It Work?

Although strictly an analogue rather than digital mode when used in its HF radio form, fax works in much the same way that it did since the early 1900s. A drum, around which is wrapped the image (picture or text) to be sent, revolves at a constant speed. As the drum rotates, a sensor slowly moves down the image in "line" increments. Where the sensor sees dark, one tone is sent, when light, another tone. In fact, the Word Meteorological Organization defines white as a tone of 2300 Hz and black as 1500 Hz. Like a normal RTTY FSK signal then, a fax signal typically shifts between 800, 900 or 1000 Hz as it moves from light to dark.

A fax decoder simply reverses this process to generate the received image. Of course, this whole process is now "virtual," with the functions of drum and sensor being carried out by a computer.

The speed of the image rotation is measured in RPM (Revolutions Per Minute), and the "line increments" by which the image is scanned is called the IOC (Index Of Cooperation). Not surprisingly, RPMs and IOCs are

standardized. 120 RPM with an IOC of 576 is most common for weather pictures (60 and 90 RPM being less common but favored more by the Russian stations), and press photos tend to be sent at 60RPM and 362IOC.

Thus, in the same way that one sees RTTY-type signals logged as 50bd/500Hz/N (speed 50bd, shift 500Hz, and normal polarity) you will commonly see Fax logged as 120/576/800 (120 RPM, 576 IOC and 800 Hz shift).

HF Fax Frequencies

Here is a list of the fax stations received consistently throughout 2000 from the eastern US.

8040.00 GFA23 9110.00 NMF/NIK 10610.90 ??? 11030 00 AXM34 11089,90 KVM70 13510.00 CFH 13900.00 BMB 13920.00 AXM35 14366.90 BAF8 14436.00 GFE23 14692.50 JMJ4 14982.60 RBV76 16035.00 9VF207 16134.90 KVM70 18441.20 JMJ5 18560.00 BMF 19327.90 "KAWN"

Bracknell Meteo, UK US Coast Guard, Boston Moscow Meteo, Russia Canberra Meteo, Australia Honolulu Meteo, Hawaii Canadian Forces, Halifax Taipei Meteo, China Canberra Meteo, Australia Beijing Meteo, China Bracknell Meteo, UK Tokyo Meteo, Japan Tashkent Meteo, Azerbaijan KYODO News, Singapore Honolulu Meteo, Howaii Tokyo Meteo, Japan Taipei Meteo, Taiwan US Air Force AWS, Soddlebunch Key FL

Decoding Fax

There is no shortage of options when it comes to decoding HF Fax today. The methods used tend to fall into one of three categories: software that uses a standard PC and soundcard, software using some hardware interface attached to the PC's serial or parallel ports, and the usual dedicated software and hardware packages. Here are some of the most popular choices:

- * WxSat is free for non-commercial use, and uses a MS Windows-based PC and soundcard.
- * JVComm uses a variety of interfaces including a soundcard on Windows-based PCs. Registering the program currently costs \$68.
- RadioRaft uses a simple "bit slicing" interface connected to the serial or parallel port of a DOS-based PC, and costs \$30.
 - Multimode is for users of Macintosh computers and is available in Lite (\$39) and Standard (\$89) versions.

The dedicated decoders from Hoka. Wavecom and others all support HF Fax modes. Figure 1 shows a typical picture received by Day Watson with a Hoka Code30 decoder from the Chilean Navy's fax station "CBV."

Want to Know More about Fax?

Probably the most respected site on the Internet is "HF Fax," maintained by long-time aficionado Marius Rensen. There you can find a mountain of information about Fax, its various forms, software, hardware, frequencies, schedules and more.

Baltic States and Canadian Forces on ALE

Finally this month, news of two new ALE networks originating in the ex-Russian Baltic states of Latvia and Lithuania. The Latvian Military has been heard on 7978, 9121, 13968.5, and 20216 kHz USB with the identifiers A25, GAL, GALVA, OZO, OZOLS, PAM, and PAMATS. It is interesting to note that the frequency of 9121 kHz also carries US National Guard ALE traffic.

The Lithuanian Military has been heard on 4836 and 5298 kHz USB with the identifiers VB1A, 3MP, NR5M, and VR5.

Also, units belonging to the 70th Communications Reserve of the Canadian Army were heard recently using ALE on 7801.5 kHz USB. Identifiers used correspond with the various unit numbers of this organization and are 700 (Borden), 709 (Toronto), 763 (Ottawa), and 7630A among others. ALE is used to trigger data transfers with MIL-188-110A 2400bd modems and the operators identified on USB voice with callsigns CIP709, CIP76 and CHH700. The procedure used by the operators follows that heard on the many other Canadian frequencies (see last month's ALE feature article) with stations announcing "Prepare for Romeo Tango Tango" before 2400bd modem bursts.

Until next month, enjoy the ones and zeros and don't forget to check DD's monthly logs which can found on-line by clicking on the "Latest Logbook" link at the Utility Monitoring Central homepage.

Resources

HF Fax http://www.hffax.de RadioRaft http://perso.wanadoa.fr/radioraft/ JVComm32 http://www.jvcomm.de/

http://www.hffax.de/WX Satellite/WXSat/wxsat.html **WxSat** http://www.blackcatsystems.com/software/ Multimode

multimode.html http://www.hoka.net/

http://www.wavecom.ch/ Wavecom UMC http://www.mindspring.com/~mike.chace

Hoko



Shortwave Broadcasting

P.O. Box 1684-MT, Enid, OK 73702 wghauser@yahoo.com www.angelfire.com/ok/worldofradio

WWFV Licensed To Broadcast Radioteletype

WWFV, Georgia, (formerly WGTG) announced it got FCC authorization Jan 4 to broadcast in radio-teletype mode, and offered a beautiful reception certificate as QSL, as noted by Kirk Trummel and John Norfolk. More details at their websites http://www.wwfv.org or http://www.wwfv.org or http://www.wwfv.org or http://www.org or http://www.org or <a href="http:/

Peter Taggart, General Manager, wrote us: We have begun our RTTY broadcast service to the hearing impaired. We use the ordinary Amateur Radio RTTY standard, so reception should not be a problem. As this service grows, we will add interesting and informative SWL, Amateur Radio, political, and other broadcasts. The website adds that this service is "desperately needed," and does not have the drawbacks of internet in cost and control. Programmers would make text files of their broadcasts available for WWFV to transmit in RTTY. WWFV transmitters are now named "Conquest." Initial RTTY in-

AFGHANISTAN [non] The new http://www.radioafghanistan.com is focused on streaming Afghan music. There is a good chance that the Afghan opposition will begin to use the web more, so keep an eye on this (Clandestine Radio Watch)

ANGOLA R. Nacional de Angola on v3374.89, 2000 French. 2100 English. 2200 Portuguese. Announced also 4950 and 7245. All one hour later, compared to awful WRTH 2001 issue (Manfred Reiff, Denmark, BC-DX)

AUSTRALIA [and non] RA started adding more relays in Jan: Singapore, 0500-0530 17865 Khmere, 2300-2330 9730 Khmere, 1400-1530 15435 "Chinese" (Nigel Holmes and Roger Broadbent, RA Feedback) Vietnamese via Taiwan at 2330-2430 on 15110; this allowed Shepparton to replace Asian languages with more English to its primary targets, PNG and Pacific (via Richard Jary, Australian Radio DX Club) RA planned to add relays via Saipan and Darwin in late January (Roger Broadbent via John A. Figliozzi) And several sites more by end of February (Chris Hambly, Victoria)

AUSTRIA Engineer Herbert A. Kuhnle, who planned frequencies for R. Austria International, passed away in late December. Following his retirement from ORF, he continued to answer correspondence from listeners and exchange tapes, and attended EDXC conferences. (Risto Vahakainu, Finland, EDXC, BC-DX)

BOLIVIA The Bolivian Telecom Authority 'Superindentencia de Telecomunicaciones' has web site at: http://www.sittel.gov.bo/ There's info on licensees on the 'Operadores' -page. It includes a downloadable Word-document of licensed

radio stations dating from 11.10.2000. News can be found in 'Publicaciones'. All the resolutions (new licences, new freqs, call changes etc.) of the year 2000 can be found at http://www.sittel.gov.bo/rsl2000.htm in downloadable Excelfile. Frequency lists (in Excel-format) are on 'Nomenclator de Radiodifusión' page at: http://www.sittel.gov.bo/pblnmn.htm (Pentti Lintujörvi, Helsinki, Finland, hard-core-dx)

6883.5, R. Impacto Cristiano, La
Paz at 1155, NEW STATIONI religious music with "Coral de los Andes." Announcing
6.880 megaciclos (Rogildo Fontenelle Aragão, Cochabamba, Conexión Digitoli

BRAZIL R. Cultura, São Paulo, seldom heard on 17815 anymore, is webcasting with great music: http://www.tvcultura.com.br/radioam/radioam.asx (gh) QSL received in 8 days from R. Difusora Taubaté, reactivated on 4925.

V/S: Emilio Amadei Beringhs Neto, Diretor Superintendente. Address: Rua Dr. Sousa Alves 960, Taubaté-SP. I advise QSL-collectors to send reports to the station now, as they are currently disposed to reply, always accompanied by some good souvenirs. I received 26 stickers, some 5 keychains, 8 or 9 pens, 3 rulers, a nice Tshirt. The station is really in a good mood

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-00=winter season, October 29-March 31; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated

cluded King James Bible 1611 Authorized Version excerpts, sked:

Sun-Fri 2300-2400 UT 5085 [sic], Sat/Sun 1800-1900 UT 12172, Sun 0500-0600 UT 3270. We quickly heard this, not on 5085 but zero-beat on 5087 in the 2300 hour, shifting back to 5085 as USB resumed at 2357.

Joel Rubin remarks, "Might it be that the RTTY broadcasts are more motivated by the WWFV survivalist beliefs that the black helicopters/rioting in the streets are coming real soon now? I'm not sure that the ability to decode these broadcasts would survive the alleged catastrophe. And I've had my doubts about the threat from U.N. troops."

RTTY and other digital bursts are also an annoyance to voice broadcasters, such as 7400 and 9400 for Bulgaria, 9405 VOA, 7455 Greece, 6200 Prague, etc., observes Bob Thomas, CT.

toward DXers (Rudolf Grimm, Brazil, radioescutas)

CANADA CBC started a new weekly program, Dispatches, a Canadian focus to world events, replacing the final half-hour of As It Happens on Wednesdays, via RCI UT Thursdays 0030 on 9755, 5960; one hour earlier from April (gh)

For two days in Dec, instead of Austria relayed by Sackville at 1600-1658 on 17865, Britain's gay LBH Radio was heard instead (David Yocis, NY, hard-core-dx and gh) Probably a feed mixup by Merlin in London, fixed after they were notified (Bill Westenhaver, RCI)

CHINA CRI at 1800 in Russian on 6040 co-channel VOA (Silvain Domen, Belgium)
Bob Padula also complains about CRI on VOA's longtime 9760. China does
not seem to care about clashing with other SW stations' long-established
frequencies (gh) That's certainly true. When CRI started using new high power
transmitters to Europe there were wild clashes with existing assignments.
After more than a year they finally left 6065 for 6040, 6065 being Radio
Sweden's key frequency for its evening transmissions to Europe and in regular use, more or less, since 1930. Now Iran, another of the intruder nations,
remains on 6065 (Olle Alm, Sweden, DXLD)

Dallas-based Continental Electronics announced an order for purchase of four high power shortwave transmitters from a customer in China, two 100 kW and two 500 kW (PRN Newswire via Ed Mayberry) Is there any "customer in China," ultimately, besides the Chicom government? Does Continental care if their equipment is ultimately used to jam Western broadcasts – or frees other transmitters to do so? (gh)

The services in minority languages had been called CNR-4, but China started a new service CNR-8 including SW in Kazakh, Korean, Mongolian, Tibetan, Uighur, while CNR-4 now applies to multi-lingual non-SW transmissions in Beijing, via satellite and live audio via https://www.hownew.com/asx/OE.asx CNR-8 is on the air from 2100 to 1700 with one hour in each language, rotating, on more in-band frequencies, but still partly on these old way-out-of-banders: 4190, 5420, 5440, 7935, 10260 (BBC Monitoring, summarized by gh)

COLOMBIA Some MW harmonics heard in Jan: On 2080.10, La Básica Mil-Cuarenta, Popayán at 1100, 2 x 1040.05. On 2099.92, Radio Uno, Monteria, at 1120, with fantastic strength during local sunrise here in Quito, 2 x 1049.96. And on 5520.16, Armonias del Palmar, Palmira at 0200, heard quite regularly, Colombian music and quite long blocks of ads, 4 x 1380.04 (Bjärn Malm, Ecuador, SW Bulletin)

La Voz del Llano, Villavicencio, on 6178v at 1200 news, nothing on fundamental 6115; and at 0035 on 6185v (Yimber Gaviria, Colombia, DX Listening Digest)

La Voz de la Resistencia, FARC clandestine on 6233.7 at 2135-2232° with news (Rafael Rodriguez R., Bogotá, DC, Colombia, World Of Radio) Also

heard on 6233.70, at *1124-1154+ with music and talk, low modulation (Dave Valko, PA, hard-core-dx)

CONGO DR On 6828.4, the week before Pres. Kabila was killed, at 1815 African music and talks in local language, many items about Congo and Rwanda, 1909 in French, no ID but in the DX press this has been logged as Bunia, operated by RCD rebels (Jari Savoläinen, Finland, hard-core-dx))

COSTA RICA On 4260.68, Radio Pampa, Nicoya at 0100, now heard better, both morning and evening. Always a female DJ, 3 x 1420.22 (Björn Malm, Quito, Ecuador, SW Bulletin) 1125-1209 on 4260.66, harmonic also heard here in Japan! Almost non-stop salsa & merengue until 1200, then religious program. ID "... en toda la familia desde Pampa" (Shoji Yamada, Tokyo, Radio Nuevo Mundo)

Not only does Faro del Caribe have big problems with modulation and spurs on 9645v, but 5055, which is on all night, had bad hum, low modulation and distortion around 0830. Various splash downward was hard to distinguish with that coming upwards from its sputnik TIDGS on 5030, which had much stronger modulation on its fundamental (gh, OK)

CROATIA [non] Though they were terminated last year, Croatian Information Center relays appear again in the current DTK Germany schedule, including 9925 at 0000-0600 (gh) Ralf Weyl at DTK Jülich says they decided to start again from January 1 but the contract had expired and were waiting on a new one to be signed (Wolfgang Büschel, World Of Radio)

CUBA R. Rebelde once again is polluting the 60mb, with a number of very power-ful and distorted spurious signals, from their primary freq of 5025 at 0900: 4990, 4960, 4925, 5060, 5095, and 5125. Also intermittent second harmonic on 10050 (David Hodgson, TN, DXLD) And 15075; also see VENEZU-FLA

DOMINICAN REPUBLIC R. Cristal, 5009.79, *1006-1040, open carrier, then signon with choral national anthem, canned sign-on announcement, music. Strong signal but very low modulation, especially during sign-on announcement (Dave Valko, PA, hard-core-dx) Audible 1100+ on exactly the same frequency, very good and strong (Brian Alexander, PA)

Relaying Radio Pueblo, 1510 AM. Canned IDs for "Radio Pueblo" and "15-10-AM". 0000 ID also as "los 5010 kilociclos de Radio Cristal Internacional en la banda tropical de 60 metros. Cruzando fronteras..." Strong signal but mostly distorted audio on some canned IDs, as if one of their tape machines was bad (Mark Mohrmann, VT)

ECUADOR On 3019.76, La Voz de la Juventud, Cañar in December at 1150, 2 x 1509.88, interference from Radio Monumental on its harmonic 3021.00, 2 x 1510.50 (Biörn Malm, Quito, SW Bulletin)

GREECE A few years ago, you had an article in MT that the Radio Free Europe Portugal facility was closing up and that five 250-kW transmitters were being donated to the Greek government – three to Athens and two to Thessaloniki. VOG engineers are close-mouthed except that VOG hoped to begin using one of the new transmitters in Nov. Something is going on. In Jan, Radiophonikos Stathmos Makedonias in Thessaloniki had a vastly improved signal on 7430 from 1900 until sign-off at 2258 UT. There was nothing on the other Thessaloniki frequencies of 9935 and 11595. It seems possible they have cut the power off from their three 35 kW transmitters and are using the total 105 kW to power up their new 250 at reduced power, in test mode. Announced schedule on 7430 had a gap 1650-1800, when I suspect they were switching from the 35 to the 250 kW unit.

Something also is definitely in the works at the VOG's Avlis facility. One of the frequencies was silent 0800-2400. When they get the new 250 going, I suspect that they will direct it to North America using their 323 degree antenna and drop the rental of the Delano and Greenville VOA transmitters.

VOG has Learn Greek from Radio, every Friday at 1335-1348 on 12105 and/or 15650 toward Tashkent, "Mathete Ellinika Apo Radiophono" (John Babbis, Maryland)

GUIANA FRENCH Montsinéry relay station was operational by November but as of December still had problems requiring less than 10 percent of transmissions to be transferred to Issoudun, France (Ulrich Wegmüller, Swiss Radio International Frequency Management, DXLD)

ICELAND National Radio, 13865, at 1215-1300°, relay of FM educational service Radio Reykjavik, Channel 1. Some relays are live, some taped. The ones at 1215 and 2300 are live newscasts, reduced carrier AM, USB modulated, all in Icelandic (David Hodgson, TN, Cumbre DX)

Sources at AFRTS tell us the projected AFRTS station is still waiting on Icelandic government approval. No date for when that will happen (Hans Johnson, Dec 28, Cumbre DX)

INDIA AIR Kurseong has reactivated 4895, at 1450 carrying Radio Newsreel in English – a woman newsreader with correspondents reports, 1500 Hindi. The tinkling tune just before the half hour followed by 6 pips and more tinkling, "This is All India Radio...", and the usual 1530 English news; music and songs, abruptly cut at 1645 (Noël Green, England, Cumbre DX via DXLD)

JORDAN R. Jordan announced that as of Jan 20 they'd change [English] to 1400-1730 on 11690 (Erik Keie, Denmark, DX Listening Digest) 11690 has RTTY co-channel and does not propagate well to NAm; 17 MHz would be fine if away from co-channel Chilel (gh)

KASHMIR [non] Voice of Jammu & Kashmir Freedom Movement sked per QSLletter: 0230- 5985 kHz, 0745- 7230 kHz, 1300- 5100 kHz (K. Hashimoto, Japan, Clandestine Radio Watch)

KAZAKHSTAN Voice of Orthodoxy is a Russian language religious broadcaster 1630-1700 9355 Tu/Fr (Nikolai Rudnev, Russia, NASWA-LN)

KOREA NORTH R. P'yongyang, in English, schedule is similar to last month's, but at 1900-2000 to EuMEAf on 4.405 6.575 6.595 6.615 9.335 11.710 13.760 (© BBC Monitoring) Note three 6 MHz frequencies 20 kHz aport, spurs? (gh)

KURDISTAN Radio Station Freedom, Voice of the Communist Party of Iraqi Kurdistan heard on 3900v at *1557-1653* (R. Petraitis, Lithuania, Clandestine Radio Watch)

LITHUANIA Received a message from Rimas Zakarevicius (LY2NX), in translation:
Lithuania is looking for your help! Lithuanian radio started to transmit programs to North America directly. The transmitter is in Sitkunai, about 20 km

NW of Kaunas. Even though the economical situation is very difficult, funding was found (approximately one million litas [\$250.000 US]) for construction of a new, modern antenna. A beautiful antenna was built with the height of 110 m directed toward North America – azimuth 310 degrees. It is a co-linear, four level, four dipole system (a total of 16 dipoles). The gain is about 20dB, which is about 100 times! The antenna is wideband and can operate between 6 and 12 MHz. 9875 kHz is utilized between 0000 and 0100 GMT. The engineers at Sitkunai are relying on the help of American Lithuanians. Reports should be sent to Mr. Petras (Peter) Leskevicius, peles@lrtc.lt (via Joe Mikuckis, K3CHP, DXLD)

The German relay continued into January on 6120, and as a rule was much better here, lower frequency and less auroral zone to penetrate. While their do-it-ourselves attitude is laudable, especially when they seem so dedicated to continuing SW broadcasts to North America, what they should have done was buy time (after all, it only amounts to one hour a day) on a better positioned and less expensive outlet, e.g. WBCQ. Surely this would have been more effective, and more cost-effective, than buying and installing their own transmitter and antennas within Lithuania. But now they have it, are they going to operate it anything close to 24h to Europe or other targets? (gh) Heard at 2100 on 11730, from where? (Bob Padula, EDXP)

MALAWI SW frequencies have been missing since mid-December, 3380 and 5993 (Chris Hambly, Australia, Chris Greenway, BBCM)

MAURITANIA Radio Mauritania pounds into the UK evenings on 4845, strongest signal in the band. Modulation and stability fine. It is safe to conclude this is the new 250 kW that Thomcast was to install (Hans Johnson, UK, Cumbre DX) Thanks to this, westerly position, and northern winter darkness around yearchonge, 4845 was still in at 0841 with Arabic music, and announcements; however, a subaudible heterodyne built up as it faded out to dominate by 0857, perhaps Brazilian (gh, OK)

MÉXICO XEVOZ, Bonita AM on 3180.00, 2 x 1590 harmonic at 1019-1033, romantic ballads, "Escuchas Bonita 15-90" (Mark Mohrmann, VT, DXLD)

MYANMAR Burmese Defense Forces Station appears to have reactivated, presumed based on frequency 6570, schedule, and programming *1330 (Richard Lam, Singapore, Cumbre DX) extended post 1530 (Hans Johnson, AZ, Cumbre DX) Plays very beautiful, oriental music (Björn Fransson, Sweden, hard-core-dx) sign-off at 1629 (Stuart, Blackpool, England, hard-core-dx)

NEW ZEALAND RNZI: Live RealAudio is available: Sun 1000-1205, 1900-2230; Mon-Thu 0300-0400, 0800-0900, 1000-1205, 1700-2230; Fri 0800-0810, 1700-2010; Sat 1000-1205. Valid until 18th March, 2001 (BBCM) When DST ends and SW frequencies no doubt change (gh)

NIGER La Voix du Sahel heard in wideband FM on 45.65 MHz at 0930. For most of the day the national programme from Niamey can be heard. The next day at 1400 UT a clear ID in French: Ici la Voix du Sahel, Station Regionale de Zinder. So I'm quite sure this is a sub-harmonic (one half) of 91.3 MHz where Zinder is listed. I think during the week there are no programs between 1300 and 1700. Once I only heard a carrier during this time (Jürgen Lohuis, Lünen, Germany, harmonics@egroups.com)

PAPUA NEW GUINEA

"KBBN", Mount
Hagen, has a
shortwave tronsmitter, courtesy of
David Robinson of
FBN's WTJC in
North Carolina.
They wanted to



start on shortwave instead of FM, but Pangtel would not assign a frequency, apparently not knowing how to do it. Pangtel thinks their priority is FM. Then Robinson of FBN told me KBBN will use shortwave to feed a network of about 10 FM repeaters in PNG as other means such as satellite are too expensive. His intention is to shoot the signal straight up so as to minimize skip zone. Robinson didn't feel that DXers would be able to hear it. He believes these will be in the 3-7 MHz range and include both a 'winter' and 'summer' frequency (Hans Johnson, Cumbre DX) They are on the Equator. What do they need seasonal frequencies for? Yeah, sure, just like DXers can't hear the Northern Australian "shower services" on 120 and 60m. Neat idea: SW quality as heard on FMI (gh)

"KBBN" is an acronym in Pidgin for the "Cry of the Bible Broadcasting Network", "Krai Bilong Baibel Bradkesting Netwok". Website is http://www.harvesttemple.com/PNG/KBBN.html (Brad Wells via Don Nelson, Cumbre DX)

PERÚ Some presumably illegal transmitters observed in Jan: 4600.72v, Radio San Juan, San Juan de Saique at 0200, previously on 5421v and 5609v. DJ announced that they now (!) have applied for a licence at "el Ministerio de Transportes y Comunicaciones" and that it will take from one to three years to get it. On 5760.34, Radio Tigre at 0000, formerly drifted around 5580-5645v. On 6631.32, Radio Uno, Chiclayo, until 0240° with NA, previously on 4577.32 and 4579.44 (Björn Malm, Quito, Ecuador, SW Bulletin)

R. La Voz de Anta, 5323.6, Acobamba, Huancavelica, 0036-0057 huayno music, s/off 0100. Next morning I started monitoring at 0950, but nothing until abrupt sign-on at 1130 "Usted escucha Radio la Voz de Anta, en los 5320 kHz, desde la ciudad de Anta, Acobamba, Huancavelica, Radio la Voz de Anta, la diferencia en radiooo..."

On 5486.7, R. Reina de la Selva, Chachapoyas, bakery ad, 80s rock (Pedro F. Arrunátegui, Lima, Chasqui DX)

PHILIPPINES FEBC have four new TCI 4x4 curtains in place at Bocaue. The transmission lines still needed to be completed, but they hoped to start using them

Shortwave Broadcasting

by end of Feb. After this, FEBC will look to upgrade its vintage US Signal Corps transmitters (Hans Johnson, Cumbre DX)

RUSSIA Sergei Sosedkin recently announced the untimely death of the well-known Russian DXer Nikolai Pashkevich due to a car accident in Moscow on January 5. Obituary is at http://www.trsc.com/musings.html and includes a photo of Nikolai taken at a meeting of Moscow DXers (Tom Sundstrom)

Radio Rossii via Yuzhno-Sakhlinsk was well heard on 11840 USB at 0101 after an absence of several months. Co-channel with HCJB. Both at good levels, with HCJB usually slightly stronger. News program. Nice to see them back (Volodya Salmaniw, BC, DXLD) At 2100 I caught the R. Sakhalinsk ID. By 2125 level had increased to an easy S-6 with no QRM (Douglas W. Johnson, WA?, BC-DX)

Special program for fishermen "Kamchatka Rybatskaya" is 2000-2100 on 7355 12065 Tue, Thu and Sat only. Special program for seamen and fishermen from Vladivostok "Radio Station Tikhy Okean" is 0815-0900 7175 7210 and 1900-1945 7135. 12045 may be used additionally at 0815 (Nikolai Rudney, Russia, WDXC Contact) Very good on 7175, no English even on Sat as previously but greetings to sailors (Volodya Salmaniw, Queen Charlotte Is,

VOR's morning English to NAm via Far East site on 7180 at 1500 was heard until closing at 1900* in Dec (Walt Salmaniw, Queen Charlotte Is, BC) VOR on 13666, not 13665 in English at 0209, listed as Petro-K (Liz Cameron, MI, MARE) and at 0254, not a typo (Larry Russell, MI, MARE) Obviously the Russkies were trying to freak out superstitious Amerikanskies (gh)

Radiostantsiya Radonezh back on SW, 6245 Christmas day from 1800 tune-in past 1930, a special? (Silvain Domen, Belgium, DXLD)

Russian Orthodox Radio Radonezh officially confirmed re-launch of SWBC. Press release on http://www.pravoslavie.ru says it started experiments December 25 for Ukraine, Belorussia and Moldova, 6245 at 17 to 20 UT. Station's own site http://www.radrad.ru invites reports to radior@mn.ru (Sergei Sosedkin, MI, DX Listening Digest) 6245 is located in Samara, the power is "more than 20 kW", antenna beamed "towards Ukraine and SE Europe" (Mikhail Timofeyev, Russia, in DX_BISTRO, via Bernd Trutenau, Lithuania, BC-DXI

SOMALIA Radio Baydhabo was first heard by BBCM in January 2001. It broadcasts in support of the Rahanwein Resistance Army (RRA); identifies in Somali Rahanwein dialect as "Radio Baydhabo, odka ururka RRA" (Radio Baydhabo, Voice of the RRA). 1600-1800 daily on 6806-v including News at 1700 daily (© BBC Monitoring) This is a reactivation. I believe that Baydhabo is the Somali spelling of Baidoa. Goal is to serve as a mouthpiece for this Army seeking to expel Husayn Aydid's forces from this area of Somalia (Hans Johnson, Cumbre DX)

Radio Hargeisa, 7530, confirmed with beautiful QSL card (with details); sent one dollar by registered mail to the Konsularische Vertretung of the Republic of Somaliland, Zedernweg 6, 50127 Bergheim, Deutschland. On the QSL is written: "10 KW T-antenna, QRG: 6390 6860 7122 7530 11640 khz". No v/s (Daniele Canonica, Switzerland, DXLD)

SOUTH AFRICA Add to schedule R. Lusofonia, Sat and Sun 1700-1900 in Portuguese on 7155, 100 kW, 76 degrees (André du Toit, SENTECH) Obviously aimed at Mozambique (gh) Quite good 1700-1800 on 7155, then blocked by Arabic, Jordan? Was mostly in English (Björn Fransson, Götland, hardcore-dx)

SPAIN Admirers of opera and classical music should listen to REE, M-F 1610-1700 for performances, all by Spanish orchestras. Reception and sound quality very good, on 21610 and 21700, i.a.; It's La Mejor Música de Nuestro Sello (Claudir Ghiggi, Brasil, radioescutas) From their own CD label; check http:// www.rtve.es/rne/sello/index.htm (Fernando de Sousa Ribeiro, Portugal, ibid)

SRI LANKA [non] IBC Tamil: Given the demise of their website and my inability to hear them, I thought this may have gone off. When I rang them, I learned they were off 7460 0000-0100 for a few weeks, but are back. English news continues sometime during the last 10 minutes or so. IBC Tamil is also at 1500-1530 on 17490. Website and E-mail remained down and it didn't seem they would be bringing them back anytime soon (Hans Johnson, Cumbre DX)

SURINAME R. Apintie, 4991 at 0620 fair strength with a few good peaks, but low, distorted modulation. Mix of popular music, but mostly American Soul/R&B. Positive ID 0630 in what sounded like pidgin English, or a local dialect. "R. Apintie" was mentioned 6 times during this talk break. Peaked 0620-0720, fell in strength significantly after 0730 (David Hodgson, TN, Cumbre DX)

TAIWAN TaipeiWave newsletter asks that reception reports now be sent to: prog@cbs.org.tw and web page at http://

www.cbs.org.tw is about to have some "exciting changes" (Mike Terry, UK)

THAILAND Radio Thailand, English to Europe at 0530-0600, to improve reception, changed Jan 15 to 12015. See http://www.prd.go.th e-mail: ampoms@mozart.inet.co.th

(R. Thailand via Kraig Krist, VA) Bath Thailand and Vietnam are using 7285 at 1100

producing an awful clash: R. Thailand in Vietnamese and . Cambodian; Voice of Vietnam in English. The band is not excessively crowded (Alan Davies, Vietnam, Cumbre DX)

TIBET [non] V. of Tibet, 1215-1300 kept changing frequencies from two transmitters and two sites in the 15595 to 15705 range (Harry Brooks, UK) sometimes on 15680 but seemed to avoid WWCR 15685 after complaints. Did not figure in IBB survey showing VOA number one (gh) Voice of Tibet, previously on

11570, No data e-mail reply in 1 day for follow up report sent to vot@nde.vsnl.net.in v/s: Sonam Dargyay. Gives postal address as Voice of Tibet, Narthang Building, Gangchen Kyishong, Dharamsala 176215 H.P. India (K. Hashimoto, Japan, Clandestine Radio Watch)

TURKEY VOT webcast is at pnm://212.175.166.3:7070/VoiceOfTurkey.rm You find this on the TRT page toward the bottom, http://www.trt.net.tr but not (that I can see) on the VOT page itself. Don't miss Reshide Morali's Letterbox Wednesdays around 1350, 1950, 2150, 2320, Thursdays 0420, tho we had good reception on 17815 at 1350-1410. She does the show in a very friendly and informal style, and we quickly learn a lot from her remarks. Her father was Turkish, from the European part of the Ottoman Empire, but she grew up in New York, which explains her accent, and ability to pronounce American names properly, unlike so many so-called English speakers, e.g. on the BBC. She recalled he beautiful fall colors the deciduous trees produced in upstate NY (gh)

As of Jan, Turkish Police Radio had not been on air for about 3 months because of a technical problem; hoped to return in a month or two to 7370, 7/24 to Turkey. Turkish Weather Radio is on air, 6900 kHz, 10 kW, 0500-1700 UT (summer 0400-1600) to Turkey (Sedef Somaltin, TRT HF Management, via George Poppin)

UKRAINE RUI announcer said 9385 is via a 100 kW transmitter in the Kiev suburb Brovary and not the 1000 kW as usual. I asked Alexander Yegorov about it (Kraig Krist) 1000 kW transmitters are too expensive to maintain now. The Radio Company of Ukraine has no sufficient means to pay for their rent. But soon it may become a reality - the 1000 kW in Mykolayiv will replace 100 kW in Brovary on 9385 (Alexander Yegorov, DX-editor of Radio Ukraine International via Kraig KG4LAC Krist) For English at 0100, 0400, one hour earlier summer

USA Judy Massa, VOA's music director and host of Border Crossings and Country Music USA, announced she would retire, her last Border Crossings January 26th. Judy has worked at VOA for over thirty years (Kim Elliott, VOA Communications World via John Norfolk) Her deporture caused concern at CMAA that country music would have even less play in Europe. See her personal site http://www.judymassa.com (gh)

WWCR's big band show replaced by Keen on Jazz, with Joel and Dawn: Sat 1730-1830 12160, Sat 2300-2400 5070, Mon 0300-0400 3215 (WWCR website, Jan)

World Of Radio projected schedule for March via WWCR: Thu 2130 15685, Fri 1030 7435, Sat 0330 3215, Sat 1230 15685, Sun 0330 and 0730 5070, Sun 2000 12160, Mon 0100 3215, Mon 0600 3210, Tue 1200 15685. Times shift one UT hour earlier in April (gh)

[non] We still have conflicting info about the relay sites actually used by Herald Broadcasting Syndicate [Christian Science], thanks to WSHB's refusal to reveal them. Despite listings to the contrary, Saipan has not been used since August 1999, one year after KHBI was sold to IBB. 1000-1100 As 11870 is via Taiwan; 1200-1300 As 5915 Vladivostok, 9880 Komsomol'sk, 1300-1400 As 7460 Irkutsk (Nikolai Rudnev, Russia, NASWA-LN and Jim Moats, OH, DXLD) Languages vary depending on day of week

UZBEKISTAN R Tashkent English at 0100 has been on 7215 (ex 7285) for some time, clean reception (Olle Alm, Sweden, BC-DX)

VATICAN [non] Vatican R, via Chita, Russia, 6205.5, Dec 23 1245-1345*, in Asian languages (Brian Alexander, PA)

VENEZUELA YVTO off-frequency to 5001 and dominating WWV 5000.0000 which at 0830 was skipping over here; a heavy het; YVTO's own minutely time check clashes with the seconds when WWV does the same. But YVTO also inserts its own ID twice every minute between about :12 and :19 seconds, "Observatorio Naval Cagigal, Caracas, Venezuela".

Radio Nacional de Venezuela, 9540, after several months unheard, seems to be on the air only at 1100, although with Swiss QRM. On a Thursday had a program produced by Universidad Simón Rodríguez, ID as Radio Nacional, Antena Internacional (Jorge García Rangel, Banda Tropical, Club Diexistas de la Amistadì

VENEZUELA/CUBA The talk show hosted by Hugo Chávez, president of what is now officially being called "la República Balivariana de Venezuela" is now being relayed by R. Rebelde and R. Habana Cuba ("on five SW frequencies for the Americas"), it was said at the beginning of the Jan 14 edition monitored live at http://www.unionradio.com.ve The program is aired every Sun, at approx. 1400-1730, on various TV channels and a huge network of Venezuelan AM and FM stations. The relays via RHC seem to have started after Cuban president Castro's visit to Venezuela last year, when the two leaders struck a deal by which Venezuela will sell petrol to Cuba on very advantageous terms. During Castro's visit to Venezuela, he also participated on Chávez' Aló Presidente show, Oct 29. Chávez used to take numerous phone calls from ordinary citizens when he started his show in May 1999, but the number of such calls seems to have dwindled (Henrik Klemetz, Sweden, DXLD)

Researching the frequencies for this http://www.radiohc.org is absolutely no help, outdated, and even so, self-contradictory. Frequency usage shows nothing after 1400, while other program titles show in the 1400-1500 period only (gh)

ZIMBABWE [non] Radio VOP [via Madagascar], 7120 heard in languages, with some English announcements, from 1701 until blocked at 1730; no signal at all the day before and the day after, tho propagation numbers were not very different (Walt Salmaniw, Queen Charlotte Is, BC)

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

Global Forum

Broadcast Logs

Gayle Van Horn

gayle@webworkz.com

0005 UTC on 7415

USA: WBCQ. Johnny Lightning's Radio New York program, calling himself the "Real Voice of America" from his, "bootiful Brooklyn facility." Trashed Matt Drudge referring to him as "Matt Sludge broadcasting with half his brain tied behind his back." Makes me think ole' Johnny is trying to be the left-wing Rush Limbaugh. WHRI 2300, 7580; WWFV (ex WGTG) 9320 USB, 2303 with Power Hour segment on lady who professes to be the bastard child of the Duke and Duchess of Windsor. (Sue Wilden, Noblesville, IN; William McGuire, Cheverly, MD)

0005 UTC on 15180

NORTH KOREA: Radio Pyongyang. Korean news with fading, // 13760, 11710. (Jim Boynton, Newton, MA) 0007-0018+, 13760.1 English news on Kim Jong II. ID 0016 with rousing military music // 151179.9, nothing on // 11460. Station audible *0000-0005* 11460 with ID and news; 11710; //137600 SIO=544;//15180 SIO=544 (Harold Frodge, Midland, MI)

0017 UTC on 9400

BULGARIA: Radio Bulgaria. Bulgaria marks the 11th anniversary of the collapse of communism, //9400. (Bob Fraser, Cohasset, MA) 0345, 9400 Radio Bulgaria Calling; 2200-2245, 7200. (Jim Boynton, Newton, MA) 0330, 7400 Time Out For Music. (David Weronka, Benson, NC) 2145-2153+, 11700 feature on commercial radio SIO=4+33+; 2005-2012, 7500. East European news coverage to ID and Behind the News program. SIO=3+53. (Frodge, MI; McGuire, MD)

0400 UTC on 7180

RUSSIA: Voice of. World newscast. (Boynton, MA) *1300, 15460 station ID to newscast. Moscow Mailbag 2115 on 5940, featuring diamonds, Olympics, Lenin and WWII. (Fraser, MA)

0426 UTC on 15320

CLANDESTINE: Voice of Hope. Open carrier 0426 to instrumental music 0427. Sign-on announcement with freqs and schedules, and purpose of broadcast. Lively high-life style music. Male's 0430 talk segment in unid language, mentions of Sudan. English greetings to friends in Sudan and mentions of "Voice of Hope." Fair and clear signal quality. (Dave Valko, PA/Cumbre DX) Voice of Jammu & Kashmir Freedom 1415; 5101 kHz anti-Indian government programming. Signal quite satisfactory, 1437*. Address: P.O. Box 102, Muzaffarabad, Azad Kashmir via Pakistan. (Jouko Huuskonen, Turku, Finland/HCDX)

0552 UTC on 4960

DOMINICAN REP: Radio Villa. Spanish. Fair signal for SIO 222, music program and station identification. (Daniele Canonica, Mugaio, Switzerland)

0600 UTC on 9745

ECUADOR: HCJB. Saludos Amigos to station ID. (Boynton, MA) Ham Radio Today 1930 on 17660. (Fraser, MA)

1343 UTC on 13650

CANADA: Radio Canada Int'l. Interview with classical singer and her musical inspiration. (Wilden, IN) Maple Leaf Mailbag, 2125, 13650 (Fraser, MA); 0225, 9755 (Boynton, MA)

1350 UTC on 18960

SWEDEN: Radio Sweden. Report and interview on communities for the mentally handicapped. (Fraser, MA; McGuire, MD)

1410 UTC on 4850

INDIA: All India Radio-Kohima. Heavy interference from Tashkent. ID, "This is All India Radio, Kohima." AIR services noted as; 1720, 4940 Guwahati //4920 Chennai; //4910 Jaipur; //4880 Lucknow; //4800 Hyderabad; //4775 Imphal. Station Radio Kashmir 4950 to 1738*. (Huuskonen, FIN/HCDX)

1413 UTC on 21745

CZECH REP: Radio Prague. Sports report into Spotlight show. (Boynton, MA) 2245, 7345 //9435 A Day of Poetry in Public Places. (Fraser, MA)

1459 UTC on 11734.09

ZANZIBAR: Radio Tanzania. After hearing this frequency in Hawaii, decided to sit on this freq and see if audible on the east coast. Signal did indeed pop on with highlife instrumental music.

Very brief children's vocals and male's extended newscast. Signal improved by 1505, fading by 1520. Never seemed to have an "official" sign-on, abruptly fades up with programming in progress. Signal very nice by 2000 recheck. (Valko, PA/Cumbre DX) 1655-1700, 11734 very good signal including music, ID and signal tone to 1700*. (Canonica, SUI)

1600 UTC on 17680

JORDAN: Radio Jordan. Jordan Ancient Cultures program, featuring Desert Castles # 7, to classical music segments. Announcements to news broadcast and 1730*. (Martin Gallas, Jacksonville, IL) Station spur 6985 at 2033 //7155 with Arabic discussion. (Zacharias Liangas, Thessaloniki, Greece/HCDX)

1620 UTC on 7530 USB

SOMALIA: Radio Hargeisc. (Tentative) Very weak signal in local language, possibly Somalian. Recitations to Arabic style music at 1645. Utility interference commencing abruptly at 1645. Subsequent daily rechecks; 1644-1703, 7530 (Canonica, SUI)

1945 UTC on 6973.1

ISRAEL: Galei Zahal. Signal noted early, although audio level weak but readable by 2005 with choral music and unid language. (Valko, PA/Cumbre DX) Kol Israel 2020; 9435 Week in Review (Boynton, MA; McGuire, MD)

1957 UTC on 11785

INDONESIA: Voice of Indonesia. Poor signal for ID, "this is the radio Voice of Indonesia" to anthem, ID repeat and schedule quote. **Deutsche Welle**'s **Rwanda** relays' interference 2000. (Frodae, MI)

2055 UTC on 9965

ARMENIA: Voice of. Interval signal at tune-in, followed for station identification and newscast. Mailbag program including music selections. (David Ross, Hamilton, Ontario, Canada)

2100 UTC on 5100

LIBERIA: Radio Liberia Int'l. English news including segment on Liberian first lady. (Chambers, NY/ODXA) 2130-2204, 5100 Highlife music program to commentary. Station identification to brief time check and Awareness program. Very nice signal at tune-in but choppy towards the top of the hour. (Valko, PA/Cumbre DX) 2240-2310+. Continuous African music with brief top-of-the hour English national news. SIO=332, improved after 2245. Best to monitor in USB, other modes impossible. (Frodge, MI)

2151 UTC on 6265

ZAMBIA: Radio Zambia. Vernaculars text with phone interviews. African highlife music to station identification. Choral national anthem to 2206*. Signal weak to poor. (Chambers, NY/ODXA)

2230 UTC on 13600

BELGIUM: Radio Vlaanderen Int'l. Station ID and music segment. (Mindy Scheer, Dunnellon, FL) 0420, 11985 (Weronka, NC) 0756, 5985 (Chambers, NY/ODXA; McGuire, MD)

2253 UTC on 7125

GUINEA: RTV Guineenne. French service of talk and music intervals. Flute interval signal 2323 to African highlife music and station ID. Orchestral national anthem to 0001 *. Signal very strong initially, generally good to sign-off. (Chambers, NY/ODXA)

2310 UTC on 9655

TURKEY: Voice of. Hues and Colors program on coal mining area on the Black Sea //6020. [Fraser, MA; Weronka, NC; McGuire, MD]

2314 UTC on 15280

ARGENTINA: Radio Rivadavia. Spanish. Sports roundup segment and mentions of stations' Radio Independencia and Radio Dobleve, plus phone calls. Commercial breaks to time pips to ID 2335 with mentions of "Argentina" and "Futbol Continental"; SIO=2+33) (Frodge, MI)

SIO = Signal strength, Interference, Overall quality

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.



The QSL Report

Gayle Van Horn gayle@webworkz.com

European Websites

Completing this month's European DX focus, the following multilingual websites are current at press time. Many include Real Audio programming links as well as email addresses and links for online reception reports or forms.

Due to column space constraints, the most actively reported European websites are listed. Additional website addresses for relay sites may be obtained from WRTH 2001 or Passport to World Band Radio 2001. This month's "The Idiosyncrasies of QSLing Europe" includes information on European relay transmitter sites.

ALBANIA Rodio Tirona http://rsh.sil.at
AUSTRIA Radio Austria Int'l http:roi.orf.at
BELARUS Radio Belarus Int'/Radio Minsk http://www.rtvr.by
BELGIUM RTBF International http://www.rtbf.be/ri

Radio Vlaanderen International http://www.rvi.be
BULGARIA Radio Bulgaria http://www.nationalradio.bg
CZECH REPUBLIC Radio Prague http://www.radio.cz
DENMARK Radio Danmark http://www.dr.dk/rdk

FINLAND YLE/Radio Finland http://www.yle.fi/fbc/rfinland

Scandinavian Weekend Radio < http://www.swradio.net>

FRANCE Radio France Int'l http://www.rfi.fr
GERMANY Adventist World Radio http://www.awr.org

Bayerischer Rundfunk < http://www.br-online.de >

Deutschlandfunk/ Deutscheland Radio http://www.dradio.de

Deutsche Welle http://www.dwelle.de

Overcomer Ministry http://www.overcomerministry.com

Sudwestrundfunk http://www.swr-online.de

United Methodist Church http://www.gbgm-umc.org>

Universal Life http://www.das-wort.com

GREECE Radio Makedonias http://www.ert3.gr

Voice of Greece http://alpha.servicenet.ariadne-t.gr/Dacs/era5eng/index.htm

HUNGARY Radio Budapest http://www.kaf.radio.hu ICELAND Icelandic Not'l Broodcosting http://www.ruv.is

IRELAND RTE http://www.rte.ie/radio/>

ITALY IRRS http://www.nexus.org

RAI International < http://www.raiinternational.rai.it>

LITHUANIA Radio Vilnius http://www.lt/lt_lrtv.htm

MALTA Voice of the Mediterronean http://www.vam-malta.org.mt

MONACO Trans World Radio http://www.trw.org

NETHERLANDS Radio Netherlands http://www.rnw.nl

NORWAY Radio Norway Int'l http://www.nrk.na/radionorway

POLAND Radio Polania http://www.radio.com.pl/polonia

Radio Racio < http://www.racja.pl>

PORTUGAL Radio Portugal Int'l http://www.rdp.pt/internacional

ROMANIA Radio Romania Int'l http://www.rri.ro

RUSSIA Voice of Russia < http://vor.ru>

SICILY Armed Forces Radio/AFRTS < http://www.afrts.osd.mil>

SLOVAKIA Radio Slovakia Int'l http://www.slovakradio.sk

SPAIN Radio Exterior de Espano http://www.rtve.es/rne/ree

SWEDEN Radio Sweden < http://www.sr.se/rs>

SWITZERLAND Swiss Radio Int'L http://www.sri.ch

UKRAINE Rodio Ukroine Int'l http://www.nrcu.gov.ua/>

UNITED KINGDOM BBC < http://www.bbc.co.uk/worldservice/index.shtml>

Virgin Radio/Global Sound Kitchen http://www.virginradio.co.uk VATICAN CITY Vatican Radio http://www.vatican.va/news services/radio>

WALES Wales Rodio International <http://wri.cymru.net>

YUGOSLAVIA Radio Yugoslovia http://www.radioyu.org

AUSTRIA

Radio Austrio Int'l, 13730 kHz. Full data QSL cord unsigned. Received in 13 days for on English emoil report. (Kris Krist, Annadale, VA)

BELGIUM

Radio Vlaanderen Int'l, 9925/13785 kHz. Full data color card unsigned, plus two stickers. Received in 47 days for an English report and one IRC. Station oddress: B-1043, Brussels, Belgium. (J.S. Summroll, Albany, NY)

EGYPT

Radio Cairo, 9990 kHz. Full data scenery card unsigned. Received in 86 days after second English follow-up report. Station address: P.O. Box 566, Cairo 11511 Egypt. (Brian Bagwell, St Louis, MO)

FINLAND

Scandinavian Weekend Radio, 11720 kHz. Full data computer generated card, including photos of the SWR staff and transmitter and crystals, plus two stickers and o brief personal letter. Received in two weeks for an English report and two U.S. dollars. Station address: P.O. Box 35, FIN-40321, Iyväskylä, Finland. (George, Maroti, NY/Cumbre)

GERMANY

Mittedeutscher Rundfunk via Bayerischer Rundfunk, 6085 kHz. Full data station cord unsigned, plus station souvenirs and brochures. Received in 46 days for a German report and one IRC. Station address used via Bayerischer Rundfunk: Rundfunkplatz 1, D-80300 Munchen, Germany. (Duane Hadley, Bristal, TN)

Sudwestrundfunk, 7265 kHz. Full dota station logo card, sticker and German letterhead on station letterhead. Received in 85 days for an English report, German return mint postage, Texas travel brochure and Rongers baseball bumper sticker. Station oddress: Neckkartrasse 230,D-70190 Stuttgart, Germany. (Tom Banks, Dollas, Texas)

ICELAND

Icelandic Nat'l Broadcasting-Rikisútvarpid, 11402 kHz. Full data scenery card unsigned. Received in 63 days for an English report, one IRC (returned with reply) and souvenir postcards. Station address: Efstaleiti 1,IS-150 Reykjovik, Iceland. (Fronk Hillton, Charles, SC)

LITHUANIA

Rodio Vilnius, 9710 kHz. Full data scenery cord unsigned. Received in 14 days for on email report. (Banks, TX)

MEDIUM WAVE

CHWK, 1270 kHz AM. This station is still CHWK, 850 Abbatsford is CKMA; 1240 Hops is CKGO per my letter from Chief Engineer Arnie Schmidt. The "new" coll letters used are for FM, with plans to move to the FM service shortly. QSL certificate for Radio Max received in 40 days. Station address: #520-45715 Hocking Ave., Chilliwack BC V2P 626 Canada. (Patrick Martin, Seaside, OR)

KAVT, 1680 kHz AM. Full data verification letter signed by Paul Shinn-Chief Engineer. Mentioned KAVT test was running 5 kW days, 1 kW nights. Station scheduled to begin Radio Disney format shortly. Station address: 139 W. Olive Ave., Fresno, CA 93728. (Martin, OR)

KJLL, 1330 kHz AM. Full data verification letter signed by Don Wiggins-Generol Manager. Received in ten days for on AM report. Station address; 1320 Campbell, Ste. 234, Tucson, AZ 85718. (Martin, OR)

Rodio Free Europe/Radio Liberty, vio Marcali, Hungary, 1188 kHz AM. Full data verification on station letterhead, signed by David Walcutt, plus o station sticker. Received in 25 days for o taped report. Station address: 1201 Cannecticut Ave., N.W., Washington, DC 20036 USA. (Mickey Delmage, Sherwood Park, Alberta, Canada)

XEMO, BCN Tijuana. Sponish verification letter signed by Sergie Gorlarle Quiros-Gerente de promociones, plus La Poderosa bumper sticker. Received in 40 days for o taped report. Station address: Grupo Unitadio, Gral. Manuel Marquez de Leon No. 950 Zona Rio, Tijuana BCN 22320 Mexico. (Martin, OR)

OMAN

Radio Sultanate of Oman, 15140 kHz. Full data QSL folder card signed by Solim Al-Nomoni-Director of Frequencies. Received in 15 days ofter o follow-up email report (with my original report attached) sent ta Mr. Salim. Station oddress: Ministry of Information, P.O. Box 600, Postal Code 113, Muscat, Omon. Email:

<abulakman@hotmail.com> (Randy Stewart, Battlefield, MO)

SOMALIA

Rodio Horgeisa, 7530 kHz. Full data QSL card, unsigned. Received in one month for on English report (sent as registered) and one US dollar. Station address: Konsularische Vertretung of the Republic of Samaliland, Zedernweg 6, 50127 Bergheim, Germany. (Daniela Canonico, Muggio, Switzerland)

SWEDEN

Radio Sweden, 18960 kHz. Bolloon QSL cord unsigned. Received in 24 days for an English email report. Station address: SE-105 10 Stockholm, Sweden. (Krist, VA; Sam Wright, Biloxi, MS)

UNITED STATES

Armed Forces Network 12689.5 kHz USB. Partial data email signed by Jennifer Gray-Broadcasting Operations Specialist. Received in three days for an English email report. Email address:

<QSL@mediacen.navy.mil> (Bill Wilkins, Springfield, MO)

Global Forum

Programming Spotlight

John Figliozzi
jfiglio1@nycap.rr.com

Can Youth Be Served?

concern that is expressed with increasing frequency concerns the aging of the radio hobby and its participants. So, how to deal with it?

Interestingly, one school of thought says to ignore it. A representative of Radio France International at last year's *Challenges for International Broadcasting* conference in Montreal flatly stated that RFI has a policy of simply not programming for anyone under the age of sixteen. Peter Barnard, noted radio critic for *The Times* (of London) also appears unfazed. He says that interest in radio and what it has to offer is something that comes with maturity. So, inevitably, as youth turns to middle age, it will come to discover the value of radio.

I'm not so sure I share Mr. Barnard's confidence. My interest in international radio began in my pre-teen years and was driven as much by the wonder of the technology (for its time) as it was by its unique content. True, things have changed in the last thirty or forty years. But abject surrender in the face of competition doesn't sound like a winning formula.

So, I am glad that there are several stations that still make a honest effort to attract a younger audience. Being solidly middle-aged, I may be the wrong person to critique these programs. Nonetheless, the job does fall to me.

The Internet as Bait

I might suggest that if you old fogies (notice I said "you") want to embark on an effort to interest a younger person in shortwave and international broadcasting, you might want to start with the Internet. For one thing, the audio quality is better. And the on-demand availability of programs allows for the "indoctrination" to take place at odd times when the "subject" may be more receptive. I've actually had some success in this regard.

The radio then becomes a "value-added" opportunity, useful when a computer is not readily available. In a recent editorial, MT's Bob Grove noted that radio sales have stabilized and even experienced a slight uptick, with evidence showing that some people were coming to radio by way of the Internet.

Rock Music

Ultimately, though, content is key. Even with MTV, The Real World and music videos,

rock radio still holds a prominent place within youth social circles. Given the pervasiveness of American rock music and the vitality of local forms of the genre globally, the following programs will sound just familiar enough not to be threatening to a new listener, while offering enough that is fresh so as not to be boring. Much of the music heard here will eventually be released in the American market anyway and there is some cachet in having heard it first, months before others.

The BBC World Service http://www.bbc.co.uk/worldservice is a good place to start as it has a number of rock music programs with differing approaches. *Top Twenty* (T 1430; W 0130; H 0630) and *The UK Album Chart* (W 1445; H 0145) play some of the British best sellers. *Music X-Press* (F 1545; A 0145) zeroes in on the newest creative trends. *Music Mix* (M 1430; T 0130, W 0630) features rock stars spinning their favorites and talking about what's influenced them, while *The Alternative* (W 0405) highlights more obscure and challenging acts.

Sounds Nordic (S 1230, 1330, 1430; M 0230, 0330), Radio Sweden http://www.sr.se/rs, broadcasts every weekend except the first, continues a long tradition of Radio Sweden programs featuring Swedish and Nordic rock acts.

The Australian Music Show (M 0610; T 0640, 2240), Radio Australia http://www.abc.net.au/ra is produced for RA by the domestic Triple J network (see below) and features the latest Aussie releases. Home Grown (A 0006), Radio New Zealand International http://www.radionz.co.nz/nr/f-nr.htm, in turn, focuses on music that is purely Kiwi.

Very short takes (one tune a day) are on offer from *Soundbox* (M-A 2250, T-S 0420) on Radio Vlaanderen Internationaal and Radio Exterior de España (T-A 0027, 0127, 0527) showcasing Belgian and Spanish rock music, respectively.

Youth Culture Programs/ Networks

An increasing number of young people are traveling to foreign countries, whether for education or recreation, and this is fueling an interest among them about what life is like for their peers elsewhere in the world. This is the focus of a small group of well-crafted programs produced by some forward-looking interna-

tional broadcasters. If the programs have a sound and pace, and deal with subject matter you find unappealing or even offensive, this may be evidence that they are "spot on" in their intent and focus. (Express some personal misgivings about them and this may just be enough to make them desirable in a younger person's eyes.)

Roughly Speaking (A 0030), Radio Netherlands http://www.rnw.nl, which focuses on the lifestyles and issues of Europe's youth, is the best of this bunch. It has a somewhat more serious and "hip" feel to it than Cool! (M 0515), Deutsche Welle http://www.dwelle.de, which, nonetheless, is a worthy entry in this genre. Both programs offer well written and timely reports, produced in a lively and appealing manner. The Edge (A 1905), BBC World Service focuses on music, movies and science in that order.

There are also three English language public broadcasting networks, now available on the Internet, that cater to youth in a different and, in some cases, more complete way than American commercial radio. BBC Radio One http://www.bbc.co.uk/radiol is that broadcaster's youth network and it focuses almost entirely on rock music. Australian ABC Triple J http://www.abc.net.au/triplej casts a little wider net musically and dabbles in science and technology topics, while serving as more of a "full service" youth culture and lifestyles network. Canada's CBC Radio Two http://cbc.ca/audio.html, which is largely a classical music and arts network, coolly transforms itself at the just the right times (weekday late nights and early mornings after 2200 ET; weekend nights and early mornings after 1900 ET) into a youth culture and music network par excellence.

♦ Mission Impossible?

Once you've succeeded in getting the younger generation interested in these offerings, you can try and move them to an intermediate level with more mainstream shortwave programs on technology, science – maybe even current events!

Until April, good listening!

[Times are in UTC and reflect broadcasts targeted to North America. Consult the MT Shortwave Guide for frequencies and day abbreviations used.]

Shortwave Guide

HOW TO USE THE SHORTWAVE GUIDE

0000-0100 twhfa USA, Voice of America ① ② ⑤

5995am 6130ca 9455af

607

Convert your time to UTC.

Broadcast time on O and time off O 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 O , then alphabetically by country O, followed by the station name . (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 A 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 (5), irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

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

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

Shortwave broadcast stations change some of their frequencies at least twice a year, in April and October, to adapt to seasonal conditions. But they can also change in response to short-term conditions, interference, equipment problems, etc. Our frequency manager coordinates published station schedules with confirmations and reports from her monitoring team and MT readers to make the Shortwave Guide up-to-date as of one week before publication.

To help you find the most promising signal for your location, immediately following each frequency we've included information on the target

area Æ 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

alternate frequency (occasional use only)

am: The Americas

Asia as: au:

Australia ca: Central America

domestic broadcast do:

eu: Europe

irregular (Costa Rica RFPI) irr:

Middle East me: North America na:

om: omnidirectional pa: Pacific

South America sa.

va: various

Consult the propagation charts.

To further help you find a strong signal, we've included a chart on page 64 which takes into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the section of the chart for the region in which you live and find the line for the region in which the station you want to hear is located. The chart indicates the optimum frequencies (in megahertz-MHz) for a given time in UTC. (Users outside North America can use the same procedure in reverse to find best reception from North America.)

Choose a program or station you want to hear. Selected programs appear on the lower half the page for prime listening hours - 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 broad-

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

Three for Three

With this month's program listings, we complete our three month remake of the Shortwave Guide section of this magazine. If you've been a long-time reader of MT, the layout of this month's listings should look rather familiar to you. This format, as with the other two introduced in January and February, will appear every third month. As you page through this section, please note the fuller descriptions that accompany each listing and, for the first time, precise advance details in a few cases-notably for some BBCWS programming and for Radio Netherlands' Weekly Documentary program. It is exceedingly difficult to obtain specific information about program topics even a few days ahead of time, let alone the five or six weeks needed to meet printing deadlines for a magazine. Nonetheless, when we can get them, you will see them here in the listings each month.

Keeping three months' issues of MT handy, you can now access programming information for each "prime-time" shortwave hour by station, by program content, and by day. Updates will be made monthly as we get them. We will stress stations that are readily receivable with a portable radio and that do not necessitate the use of a complex antenna system. In the main, the broadcasts listed in the Selected Programs columns will be those that are targeted to North America; but, in some cases, the listings will include broadcasts to other areas that have been reported to be well received on this continent. As well. stations that have been identified by polling data as the most popular with listeners will have their listings in MT every month. As space permits and information is available, we will include other lesser known stations in the interests of rounding out the shortwave programming picture.

Finally, don't hesitate to drop us a line either electronically or by post. We would dearly love to have your reactions to and observations about this effort and have you contribute to the effort with timely program information that you observe, obtain or hear.

FREQUENCIES .

0000	0015 0030 0030 0030	Thailand, Radio UK, BBC World Service 6195as 11945as	9705am 11 9680va 3915as 59 7105as 94 11955as 12	410me 9:	590om	6175na 9915sa 15260os	0000 0000 0000 0000	0100		USA, KAIJ Dallas TX	9545da 6055na 3955eu 6170eu 4278va 6458va 12689va 5755va 7510na	6180eu 4319va 6B47va 13362va		5765va 10940va
		17615as India, All India Radio North Korea, R Pyongyang 15180na	9705as 99			13605as 13760na	0000	0100 0100 0100	twhfa	USA, KTBN Salt Lake City UT USA, KWHR Naalehu HI USA, Voice of Americo 9775om	17510as 5995am 11695ca	6130ca 13740am	7405om	9455co
0000 0000 0000 0000	0059 0100 0100 vl 0100 vl 0100 vl 0100 vl	Canada, R Canada Internationa Anguilla, Caribbean Beacon Austrolia, ABC/Alice Springs Austrolia, ABC/Kotherine Austrolia, ABC/Kotherine Austrolia, ABC/Tennant Creek Australia, Christian Voice Australia, Radio	6090am 4835do 5025do 4910do 9875va 15 9660pa 12 17795va 21			21680va 17580va	0000 0000 0000 0000 0000 0000 0000	0100 0100 0100 0100 0100 0100 0100 010		USA, WBCQ Monticello ME USA, WEWN Birminipham AL USA, WHRA Greenbush ME USA, WHRI Noblesvile IN USA, WHRI Noblesvile IN USA, WIGR Upton KY USA, WRMI Minami FL USA, WRMI Minami FL USA, WSHB Cypress Crk SC USA, WTIC Newport NC	7415na 5825va 7580na 7315sa 12160am 7490va 9955am 9430am 9370na	9335na 7425na 13595as	9355no	
0000 0000 0000 0000	0100 0100 0100 0100 0100	Canada, CBC Northern Service Canado, CFRX Toronto ON Canada, CFVP Calgary AB Canada, CHNX Halifax, NS Canada, CKZN St John's NF	9625do 6070do 6030do 6130do 6160do	-50110			0000 0000 0000 0000	0100 0100 0100 0100 0100		USA, WWHS Macon GA USA, WWCR Nashville TN USA, WW-V McCay-ville GA USA, WYFR Okeechobee FL Vanuatu, Radio	11900eu 3215am 5085va 6085na 3945do 4965do	5070am 6890am 9505na 4960do	5935am 15060as 7260do	7435am
0000	0100 0100 a/monthly	Canado, CKZU Voncouver BC Costa Rica, R for Peace Intl Costa Rica, University Network Ecuador, HCJB Finland, Scandy Weekend Radic Guyana, Vaice of	7490va 15 9745no 11 11690va 11	504Bvo 1	5065va 5065va ! 1 455usb	21815usb	0000 0030 0030 0030 0030 0030	0100 0100 0100 0100 0100 0100		Zambia, Christian Voice Iran, VOIRI Kirgiziya, Kirgiziya Padio Lithuania, Radia Vilsius Sri Lanka, Sri Lanka BC Corp Sri Lanka, Sri Lanka BC Corp	6065am 4010eu 6000na 4940do 4940do	6135na 9875na 9770eu 6005as	6150na 6075as	9022na 9770as
0000 0000 0000 0000 0000	0100 0100 0100 0100	Japan, Radio Liberio, Voice of Hope Malaysia, Radio Malaysia, RTM Kota Kinabalu Molaysia, RTM Sarawak Namibia, Namibian BC Corp	6145na 6280af 7295da 5980do 7160do 3270af 32	289af			0030 0030 0030	0100 0100		Thailond, Radio UK, BBC World Service 7105as 12095sa USA, VOA Special English	13695na 5965as 9410me 15280os 7215os	5975na 9590am 15360as 9890as	6175na 9915sa 17790as 11760as	6195as 11955as 15185as
0000 0000 0000 0000	0100 0100 0100 0100 vl	Netherlands, Radio New Zeoland, R New Zeoland In New Zeoland, ZLXA Papua New Guineo, NBC Singapore R Corp of Singapore Solomon Islands, SIBC	117675pa 3935do 72 9675do 1	845na 290do 1880do			0045 0050	0100 0100 0100 0100	vl	USA, Voice of America	17740as 7215as 17740as 9780as 6010na 11570as	17820as 9890as 17820as 11650as 9675na	11760as 15455as 11800na	151B5as

SELECTED PROGRAMS

Sun	day	
0000	R. Netherlands	Sound Fountain (interesting topics explored with unique applications of sound)
0001	BBCWSom	Play of the Week (classic and contemporary drama for radio)
0005	R. Canada Int. R. New Zealand Int. R. Australia	Quirks and Quarks (what's new and next in science) Bookmarks (NZ books, interature and writers)* Carrespondents' Report (ABC News reporters background international events)
0010	R. Jopan	Hello from Tokyo (listener letters, music and short fea- tures)
0015	Spanish Foreign R.	American Chronicles (America from a Spanish perspec- tive)
0030	Spanish Foreign R.	Spain in the American West (Spanish social and cul- tural influences on the western U.S.)
	R. Austrolia	Educational series (details not yet available at dead- line)
	R. Netherlands	Roughly Speaking (European youth lifestyles maga- zine)
	R. New Zealand Int. WHRI(5745kHz.)	Future Indicative (a magazine for disabled persons)* Duing with Cumbre (Marie Lamb with the hortest OX catches)
Mon	iday	
0000	R. Netherlands R. Japan	Dutch Horizons (Bertine Krol chronicles life in Holland) Weekend Square (aspects of life in Japan with music, interviews and relaxed features)
	WBCQ	Le Show (Harry Shearer's tour-de-force variety show)
0005	R. Conodo Int.	Global Village (Jowi Taylor fields reports and music from global venues)
0015 0030	Spanish Foreign R. BBCWS(om)	Entremeses (the food and sites in Spain's regions) The World Taday (the BBC's agenda-setting flagship alobal news program)
	R. Australia	The Health Report (Dr. Norman Swan's weekly report on health and medical issues)
	R. Netherlands	Sound Fountain (interesting topics explored with unique applications of sound)
0045	Sponish Foreign R.	Radio Club (a repeat of Saturday's 0035 program)

Monday-Friday
0005 R. New Zealand Int. Codenza (light classical music selections)*

0010	R, Austrolia	Asia-Pacific (Radio Australia's flagshig current events and business report for and about Asia and the Pacific region)
Tues	dav	
0000	R. Netherlands	The Research File (a magazine emphasizing the relevance of science to all our lives)
0030	R. Australia	The Law Report (Susanna Lobez presents breaking legal stories in Australia and overseas)
0045	R. Netherlands 8BCWS(om)	Euroquest (a magazine placing Europe:in conteat) Patterns of Faith (a globel exploration of religious values and human wisdon) [until 13th/14th-and for Thought- foods that have strong connections with the soul or spirit, including 6th/The Caseu, the socred drink of Mazambique)
Tues	day-Saturd	av
0000	Spanish Foreign R.	REE's News Service (featuring international, libero-American and national news in-depth, a review of the Spanish press, commentaries and analyses)
	VOA	News Now (the YOA's continuous rolling news service with analysis, sports, business reports and tupical features)
0005	BBCWS(am) R. Canada Int.	Outlook (topical magazine of people, pieces and events) As It Happens (from 2330)
0015 0045	R. Japan Spanish Foreign R.	44 Minutes (current affairs magazine altout Japan and Asia) Spanish Language Course
Wed	nesday	
0000	R. Netherlands	Music 52/15 (Martha Hawley presents musical styles from ground the globe)
0030	R. Austrolia	The Religion Report (John Cleary examines the way religion and societies interact)
0045	R. Netherlands BBCWS(am)	A Good Life (how development affects sacieties) Plain English (programs focusing on aspects of longuoge) [ifav 28"/29"-The E Files-what happens when English is used as an international longuage]
Thu	sday	
0000	R. Netherlands	The Weekly Documentary (RN's award-winning sound essays and in-depth investigations) [1:1/3rd-ll Prince in Penambuso David Swaffing examines the rise of the Dukt sove trode in the 16° contury, 8th/Llth-Dutch-Canadian History-with Martha Howley, 15th/1"th-Sax, Sax's and Screens-lonathan Groubert explains the formulas, rules and

		symbols of the immersely popular Indian film in try; 22nd/24th-Cinema Diespere-Jonathan Grob looks at the influence of Indian films on Indians w have never lived in India.]
=030	R. "ustrolio	The Media Report (Mick O'Regan takes a critical the latest developments in the communications ind try)
	R. Fetherlands WEEQ	Durch Horizons (Bertine Krol chronicles life in Holla World of Radio (Glenn Hauser's comprehensive revi of the week in shortwave and international broadce ina)
0045	BB#WS(am)	Heart and Soul (global religious and spiritual exp ences)
Frid	av	
0000	R. Betherlands	Encore (replaying the best programs from RN's chives)
0030	R. Australia	The Sports Factor (Amanda Smith presents rep which debate and celebrate the cultural significa of sport.)
	R. Hetherlands	The Research File (a magazine emphasizing the evance of science to all our lives)
Sati	arday	
0000	R. Betherlands WHRI(5745kHz.)	A Good Life (how development offices societies) Dising with Cumbre (Marie Lamb with the hottest catches)
0005	R, New Zealand Int.	Home Grown (Liz Barry plays contemporary Kiwi r sic)*
0030	R. Australia	Feedback (Rager Broadbent answers listener questi and provides regular updates about RA)
	R. Netherlands R. New Zeoland Int.	Documentary (see Thursday 0000 listing for detail Musical Chairs (the music and background of a fured NZ musician)*
CD33	VOF News Now	Press Conference USA ('Meet the Press' for shortwo
CD35	Spanish Foreign R.	Radio Club (answering listeners' letters)
CD45	BBGA/S(om)	Body and Mind (how health and medicine relatively) [thru 21st-Health Check-a recurring series king at global health and medicine issues.]
	Spanish Foreign R.	Radio Waves (a weekly program for radio enthusia

FREQUENCIES .

0100 0100 0100 0100		Italy, RAI International Pakistan, Radio Netherlands, Radio Czech Rep, Radio Prague Intl Iran, VOIRI	6010na 9780as 6165na 6200na 6065am	9675na 11650as 9845na 7345na 6135na	11800na 15455as 6150na	9022ng	0100 0100 0100 0100 0100	0200 0200	vl/os	Papua New Guinea, NBC Singapore R Corp of Singapore Solomon Islands, SIBC Solomon Islands, SIBC Spain, R Exterior Espana	9675do 6150do 5020do 9545do 6055na	11880da		
0100	0130 s	Vietnam, Voice of Germany, Universal Life	9525na 9435as				0100			Sri Lanka, Sri Lanka BC Corp 15425as	4940do	6005as	6075os	9770as
0100 0100	0130 0130	Slovakia, R Slovakia International USA, Voice of America 11705as 17820as	5930no 7115as 11820as	7230ca 7200as 15250as	9440sa 7200as 15300as	9850as 17740as	0100	0200 0200		Switzerland, Swiss R Internation- UK, BBC World Service 9410me	19905am 5965as 9590am 15310as	5975na 9915sa 15360as		6195as 12095sa
0100		Uzbekistan, Radio Tashkent 9540as	5955os	5975as	7105as	7215as	0100	0200 0200	as .	UK, Global Kitchen/Merlin Ukraine, R Ukraine Internationa	3955eu	6180eu 9610na	17790as 7165eu 9385na	9810na
0100	0145	Germany, Deutsche Welle 9765na	6040am 12040na	6145na	9640am	9700na	0100			11840na USA, Armed Forces Radio				
0100 0100 0100	0156 0156 0200	China, China Radio Internationa North Korea, R Pyongyang Anguilla, Caribbean Beacon		11735va	15229va	17734va	0100			6350vo 12579va	4278va 6458vo 12689va	4319va 6847vo 13362va	4993va 10320va 16847va	5765va 10940va
0100 0100 0100	0200 vI 0200 vI 0200	Australia, ABC/Katherine Australia, ABC/Tennont Creek	5025do 4910do				0100 0100	0200 0200		USA, KAIJ Dallos TX USA, KTBN Salt Lake City UT USA, KWHR Naalehu HI	5755va 7510na 17510as			
0100		Australia, Christian Voice Australia, Radio	9875va 9660pa 17750as	15165va 12080pa 17795va	17645va 15240as		0100	0200	twhfa	USA, Voice of America 9775am	5995am 13740am		7405am	9455ca
0100 0100 0100 0100 0100	0200 0200 0200 0200 0200 0200	Canada, CBC Northern Service Canada, CFRX Toronto ON Canada, CFVP Calgary AB Canada, CHNX Holifox, NS Canada, CKZN St John's NF Canada, CKZN St John's NF Canada, CKZU Vancouver BC		1777340	2172340		0100 0100 0100 0100 0100	0200 0200 0200 0200 0200		USA, WBCQ Monticello ME USA, WEWN Birminghom AL USA, WHRA Greenbush ME USA, WHRI Noblesville IN USA, WINB Red Lion PA USA, WJCR Upton KY	7415na 5B25na 7580na 7315sa 12160om 7490vo	9335na 7425na 13595os	9355na	
0100 0100 0100 0100	0200 0200 0200 0200	Costa Rica, R for Peace Intl Costa Rico, University Network Cuba, Radio Havana Ecuador, HCJB	7480va 7480va 6000na 9745no	15048va 15048va 9820na 11840na	15065va 11705na 21455usb	21815usb	0100 0100 0100 0100 0100	0200 0200 0200 0200 0200	sm	USA, WRMI Miomi FL USA, WSHB Cypress Crk SC USA, WTJC Newport NC USA, WWBS Macon GA USA, WWCR Nashville TN	9955am 9430na 9370na 11900eu 3215am	5070am	5935am	7425
0100 0100 0100 0100	0200 a/monthly 0200 0200 0200	Finland, Scandv Weekend Radio Germony, Voice of Hope Guyana, Voice of Indonesia, Voice of	11690va 6185na 3289do 9525va	11720va 5949do 11785vo	15140		0100 0100 0100	0200 0200 0200	vl	USA, WWFV McCoysville GA USA, WYFR Okeechobee FL Vanuatu, Radio	5085va 6065na 3945do	6890am 9505as 4960do	15060as 7260do	74330M
	0200	Japon, Radio 17835sa Liberia, Voice of Hope	9515va 17845as	11860as	15149va 11870va	15325as	0130	0145 0159		Zambia, Christian Voice Libyo, Voice of Africa Finland, YLE/R Finland	9655na	17725af 12035na		
0100	0200 0200 0200	Malaysia, Radio	6280of 7295do 5980do					0200		Lithuonia, Radio Vilnius Sweden, Radio	6120na 7290as	9495as		
0100	0200 0200	Namibia, Namibian BC Corp New Zealand, R New Zealand In New Zealond, ZLXA	3270af	3289af 7290do			0130	0200 0200	twhfa twhfa	UK, RTE Radio USA, VOA Special English USA, Voice of America Vatican City, Vatican Radio	6155ca 7405am 5995am 7335au	9775am 6130ca 9650au	13740am 9455ca	
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2EI	LECTED PR	OGRAMS			• • • • • • • • • • • • •			
Sun 0100	H day BBCWS(om)	The World Today (the BBC's agenda-setting flagship	0130	Spanish Foreign R. RTE Ireland	Entremeses (the food and sites in Spain's regions) Sportsnews (reports and accounts on the weekend's events)	0130	BBCWS(am)	affairs radio documentary program) Westway (a radio saap opera)
0105	Doutsche Welle R. Austrolia	global news program) Talliang Point (European journalists discuss the week) The Europeans (historical and cultural perspectives on European societies)	Moi 0105	nday-Friday R. New Zeoland Int.	In Youth with New Zealand (a domestic afternaon variety program hasted by Wayne Mowart)*		Deutsche Welle HCJB Ecuador	Living in Germany (people, places and events) Ham Radio Today (Graham Bulmer hosts a program for radio ameteurs)
	R. Netherlands	Europe Unzipped (past week, unusual events)			program nustac by wayna monari)	Frid	law	
	R. New Zealand Int.	Eureka! (reports on science in NZ)*	Tue	sday		0105	BBCWS(am)	Maridian Writing County on hooks the town
0110	R. Prague HCIB Ecuador	Readings from Czech Literature DX Partyline (Allen Graham kasts a weekly program for	0105	BBCWS(am)	Meridian-Ideas (a series that explores "big" cultural Ideas)	0103	ooch s(uin)	Meridian-Writing (reports on books, theatre, poetry, journalism, biography, history and anthopology) [thru
0110		DXers and SWLs)	0110 0130	R. Austrolia BBCWS(am)	The Science Show (a long-running ABC program) The Music Mix (insights into current popular music) [thru 28*-			10"-Writers on Location-Rosemary Hartill meets au- thors who identify with a particular part of Britain.
	R. Prague Swiss R. Int.	Saturday Music (Czech classical, folk, jazz or rock) The Name Game (listeners try to identify a mystery Swiss	0.00	Dacis Jam)	Blues World-Tony Russell looks back at blues' heritage	0110	R. Australia	Hindsight (Australian social history waven from the memories of those who were there)
0115	Doutsche Welle	location)[1st Sun, of the month] Inside Europe (a weekly magazine exploring the topical		China R. Int.	and plays the best of the new] Sports World (sports in China and Asia)	0115	Doutsche Welle	Spotlight on Sport (report on German and European
0113	nonzrie stelle	issues shaping the continent)		Doutsche Welle	Insight (major international trends and developments)	0130	BBCWS(am)	sport)
	Spanish Foreign R.	American Chronicles (a Spanish perspective)	Tue	sday-Saturd	les.	0130	openolami	World of Music (the best of folk, non-Western classical and non-Western popular music)
0120	China R. Int.	In the Spotlight (Chinese arts and cultural magazine)	0100	R. Netherlands				one non-resistin popular neuscy
0130	BBCWS(am)	Reporting Religion (Jane Little presents the week's main religious news)	0100	Spanish Foreign R.	Newsline (news, analysis and background reports) REE's News Service (leaturing international, there-American	Sat	urday	
	RTE Ireland	Sportsnews (reports of weekend events)			and national news in-depth, a review of the Spanish press,	0105	BBCWS(am)	Meridian-Masterpiece (critiques of creative endeavors)
	Spanish Foreign R.	Spain in the American West (Spanish social and cul-		VOA	commentaries and analyses)	0110	R. Australia	Arts Tolk (Julie Copeland presents the world of arts and cultural ideas)
	YLE R. Finland	tural influences on the western U.S.)		YUN	News Now (the VOA's continuous rolling news service with analysis, sparts, business reports and topical features)	0130	BBCWS(am)	Westway (a radio soap opera)
0140	R. Habana Cuba	Capital Cafe (conversations with Finns) DXers Unlimited (Arnie Coro presents a program from	0105	Doutsche Welle	Newslink (daily current affairs magazine focused on Europe)		Deutsche Welle	German by Radio (a language lesson)
	n. Handing Cood	rodio enthusiosts)	0110	HCIB Ecuador	Studio 9 (focused reports on Latin America)		HCIB Ecodor	Musica del Ecuador (Jorge Zambrana presents selec-
	Swiss R. Int.	(repeat broadcast of the 0110 program)	0130 0145	RTE, Ireland Spanish Foreign R.	The News at Six (RTE's flagship evening news program)		WWCR(3215 kHz.)	tions of Ecuadorian and Andean music) World of Radio (Glenn Hauser's comprehensive review
0145	BBCWS(am)	Letter from America (Alistair Cooke's weekly commen- tary on life in the USA)	0143	Spanish roraign K.	Sponish Language Course			of the week in international broadcasting)
0150	YLE R. Finland	Nounti Latini (the news in classical Latin)	Wed	Inesday		0133	VOA	Communications World (Kirn Elliott reviews the week in
D.0			0105	BBCWS(am)	Meridian-Screen [thru 29" On Screen-a weekly report on	0135	Spanish Foreign R.	global communications) Radio Club (answering listeners' letters)
Mor			0110	R. Australia	international cinema)	0145	BBCWS(om)	Revolver (a musical guest gives a personal view on new
0100	BBCWS(om)	The World Today (the BBC's agenda-setting flagship global news program)	0110	A. AUSITURO	The National Interest (Terry Lane's round-up of the week's major issues)		• •	releases from country to techno)
	WWCR(5070kHz.)	World of Radio (Glenn Houser's comprehensive review	0130	Doutsche Welle	Man and Environment (John Hay presents the human ele-		Spanish Foreign R.	Radio Waves (a weekly program for radio enthusiasts)
		of the week in international broadcasting)	01.46	B 0-1	ment in environmental issues)	(*This R	NZI program oirs one hor	or UT later from March 18.)
0105	Doutsche Welle	Religion and Society (an insight into religious events)	0140	R. Habana Cuba	DXers Unlimited (Arnie Coro presents a program from radio enthusiasts)	1 1110 11	program one one nee	er wer merser researcher 1 str. g
0110	R. Netherlands R. Austrolia	Wide Angle (a single issue examined in-depth)			0(1)(03023(2))			
0110	N. MUSITONO	Awaye! (Australia's only national indigenous arts and culture program)	Thu	sday				
0115	Doutsche Welle	Arts on the Air (Broandain O'Shea covers the German	0105	BBCWS(om)	Music Review (classical music news and features)			

Music Review (classical music news and features)
Background Briefing (ABC Radio's award-winn ng current

cultural scene)

0105 BBCWS(om) 0110 R. Austrolia

Shortwave Guide

0200 UTC

FREQUENCIES

0200 0200	0210 0215	vl	Bangladesh, Bangla Betar Libya, Voice of Africa	4882as 17725af				0200 0200			South Koreo, R Karea Intl Sri Lanka, Sri Lanka BC Corp	7275na 6005as	11725sa 6075as	11810sa 6130do	15575na 9770as
	0227		Czech Rep, Radio Prague Intl Hungary, Radio Budapest	6200na 9835na 7185do	7345na			0200	0300		15425as Taiwan, R Taiwon laternational 15125as		9680na	11740as	11825pa
0200 0200 0200	0230 0240 0245	f	Myanmor, Radio UK, Globol Kitchen/Merlin Germany, Deutsche Welle	6170eu 7285as	9615as	9765as	11965os	0200	0300		UK, BBC World Senice 9770af	5975na 9915sa	6135am 11760me	6175na 11955as	9410me 12095sa
0200 0200	0256 0256		North Korea, R Pyongyang Romania, R Romania International	11845va 9570na 15370pa	13650va 9690as	11830na	11740as	0200	0300		USA, Armed Forces Rodio 6350va	15310as 4278va 6458va	15360as 4319va 6847va	17790as 4993va 10320va	5765va 10940va
0200	0259		Canada, R Canada Internationa 15260as		9755am	11725am	11990am		0300		USA, KAIJ Dallas TX	12689va 5755va	13362va	16847va	
0200		twhfa	Anguilla, Caribbean Beacon Argentina, RAE	6090am 11710am 4835do				0200 0200 0200	0300		USA, KJES Vado NM USA, KTBN Salt Lake City UT USA, KWHR Naaleho HI	7555na 7510na 17510as			
0200 0200 0200	0300 0300 0300		Australia, ABC/Alice Springs Australia, ABC/Katherine Australia, ABC/Tennant Creek	5025do 4910do					0300		USA, Voice of America 11820o:		7200as 15300as	9850as 17740as	11705as 17820as
0200 0200	0300		Australia, Christian Voice Australia, Radio	9865va 9660pa	12080pa	17645vo 15240as 21725va		0200			USA, WBCQ Monticello ME USA, WEV/N Birmingham AL USA, WHFA Greenbysh ME	7415na 5825va 7580na	9335na 7425na		
0200 0200	0300		Canada, CBC Northern Service Canada, CFRX Toronto ON	17580va 9625do 6070do	17750as	21/2540		0200	0300 0300		USA, WHFI Noblesville IN USA, WIN8 Red Lion PA	7315sa 12160am			
0200 0200	0300 0300		Canada, CFVP Calgory AB Conado, CHNX Holifax, NS	6030do 6130do					0300		USA, WJCR Upton KY USA, WRM Miam F. USA, WSHB Cypress Crk SC	7490va 7385am 9430na	13595as 7535na		
0200 0200 0200	0300 0300 0300		Canada, CKZN St John's NF Canada, CKZU Vancouver BC Costa Rico, R for Peace Intl	6160do 6160do 7480va	15048va			0200	0300 0300		USA, WTJC Newport NC USA, WWER Nashville TN	9370na 3215am	5070am	5935am	7435am
0200	0300		Costa Rico, University Network 21815ir	5920al 6000na	6970vo 9820na	7480va 11705na	15C48va	0200 0200 0200	0300 0300 0300	vl	USA, WWFV McCayeville GA USA, WYFR Okeechiobee FL Vanuotu, Radio	3270va 6065na 3945do	5085am 9505na 4960do	7260do	
0200 0200 0200	0300 0300 0300		Cuba, Radio Havona Ecuador, HCJB Egypt, Radio Cairo	9745na 9475am	11840na	21455usb		0200 0200	0300 1215	**	Zambia, Christian Voice Cambodia, National Rodio Of	4965do 11940as	71/5		
0200 0200	0300 0300	a/monthly	Finland, Scandy Weekend Radio Germany, Voice of Hope	11690va 6185na 3289do	11720va 5949do			0215 0230 0230			Nepal, Radio Vietnam, Voice of Austria, R. Austria Internationo	5005os 9525na 7325na	7165as		
0200 0200 0200	0300 0300 0300		Guyona, Voice of Iroq, Radio Iraq International Kenya, Kenya BC Corp	9684vo 4935do	11785va			0230 0230	0300 0300		Slovakio, Adventist World Rad Sweden, Radio	o 7235as 7155alt	9495am		
0200	0300		Liberia, Voice of Hope Molaysia, Rodio Malaysio, RTM Koto Kinobalu	6280af 7295do 5980do				0230 0245 0250	0300		Switzerland, Swiss R Internation Albania, R Tirana Internationa Vatican City, Vaticar Rodio		9905am 7160na 9605am		
0200 0200 0200	0300 0300 0300		Namibia, Namibian BC Corp New Zealand, R New Zealand	3270af nt17675pa	3289af			0250 0257	0300 0300	٧l	Zambia, National BC Corp Malawi, Malawi BC Corp	6165do 3380do 5895eu	6265do 7455na	7475eu	12105na
0200	0300	γl	New Zealand, ZLXA Papua New Guineo, NBC Russia, Voice of Russia WS	3935do 9675do 7125no	7290do 11880do 7180no	12010na	12020na	0300 0300 0300	0310	m-whf	Greece, Voice of Vatican City, Vaticon Rodio S Africa, Channel Africa	7305am 9525af	9605am	747360	12105110
0200	0300		Singapore R Corp of Singapore	15470na 6150do		. 20 . 0/10	0 . 0	0300	0330 0330	sm w fa	Belarus, R Belarus Internation Egypt, Radio Coiro	9475am	7210eu		
0200 0200	0300 0300		Solomon Islands, SIBC Solomon Islands, SIBC	5020do 9545do				0300	0330		S África, Adventist World Radi	731301			

SELECTED PROGRAMS

Sun	day	
0200	BBCWS(om)	The World Today (the BBC's agendo-setting flagship alabal news program)
	HCJB Ecuado	Hom Radio Today (Graham Bulmer basts a program for radio amateurs)
	WBCQ	Morion's Attic (a treasure trave of rere and vintage recordings presented by Morion Webster)
0205	R. Conada Ist	Canada Newsweek (the past week in Canada)
0200	R. Progue	Readings from Czech Literature
0210	R. Habana Ceba	The World of Stomps (this just might be the only pro- gram on radio on philatelic matters)
	R. Progue	Saturday Music (Czach classical, falk, jazz or rock)
0211	Voice of Russia	News and Views (Russian views on naws)
0215	R. Taipei Int.	Great Wall Forum (Taipei'sview on China-Taiwan)
0230	BBCWS(am)	From Our Own Correspondent (the background to
0200		events from BBC correspondents around the world)
	Radio Australia	Innovations (a program showcasing Australian inven- tion, enterprise and ingenuity)
	R. Conada Int	Conada Review (a business and technology edition of RCI's weekend magazine)
	R, Sweden	Weekand, mogazine about Europe firm the Radio E consortium (1st week); Sweden Today, George Wood presents the voices of Sweden(2nd week); Spectrum, Bill Schiller covers Swedish cultural scane (3rd week); Studio 49, idous and long-term trends in the Mordio reacion (4th week)
0232	Voice of Russia	Mascow Yesterday and Today (recalling the most in- teresting events in the history of the City)
0240	Swiss R. Int.	The Name Game (listeners try to identify a mystery Swiss location)[1st Sun.]
Moi	nday	
0205	BBCWS(om)	Wright Around the World (Steve Wright puts best e- mails, letters, etc on the air while playing requests)
	R. Conada Int	The Maple Leaf Moilbag (Mark Montgomery onswers listener mail and hosts the formightly CIDX Report for

dons)

R. Budopest

R. Toipei Int.

Heading to Hungary (a monthly travalague)
Jade Bells and Bamboo Pipes (Carson Wong intro-

	R. Hobona Cubc R. Sweden	The Jazz Place (the very best of Cuban jazz) In Touch with Stockholm presented by Nidia Hagström, an interactive listener contact program (1.2 weekend); Sounds Nordic presented by Gaby Katz, youth music and trends									
0232	Voice of Russia	magazine (all other weekends) Timelines, variety show by Estelle Winters, insight into life in Mascow through foreign eyes)									
Mon	day-Friday										
0205	R. New Zealand Int.	In Touch with New Zealand (a domestic afternoon variety program hosted by Wayne Mowat)									
0210	R. Australia	The World Today (a comprehensive current affairs program with Monica Attard and John Highfield)									
0245	R. Toipei Int.	Let's Learn Chinese									
Tues	day										
0205	BBCWS(am)	Health Matters (reports on research mc eining where medi- cine is going) [thru 13th/14th-20/20 Vision-Sue Armstrong asks what should modern healthcare priorities be?!									
0232	Voice of Russia	Folk Bax (music drawn from the traditioes of the hundreds of nationalities that make up Russia and the CIS)									
Tuesday-Saturday											

duces selections of traditional Chinese music)

Conada Review (arts edition of weekend magazine)

The Book and the Spade (the latest discoveries and developments in Biblical exchaeology)

Science View (the latest research pur in a wider social context) (Both of the programs Seeing Stars, about as-

R, Canado Int.

0210 R. Budopest R. Conada Int. Voice of Russia 0230 R. Sweden

Wednesday

0200 HCJB Ecuador

BBCWS(om)

with Monica Arrard and John Ingentions Let's Learn Chinese			regiony
	Frid	ay	
	€205	BB#WS(am)	One Plane
Health Matters (reports on research aux aining where medi- cine is going) [thru 13th/14th-20/20 Vision-Sue	C230	BB#WS(om)	ogriculture People an
Armstrong asks what should modern healthcare priorities be?]	C 245	R, Sweden	and exper Nordic Re
Folk Bax (music drawn from the traditioes of the hundreds of nationalities that make up Russia and the CIS)			Greenscon tal aware health an
lay			Kris Bosw week)
Hungary Today (current events in Hungary) Conada Today (interviews, correspondents' reports and Ca-			wouny
nation views on world and national events)	Sat	urday	
Commonwealth Update (comments or domestic develop- ments and major domestic issues)	C205	BBGA/S(am)	Discovery in science
Sixty Degrees North (reports, interviews and analysis on the		R. Australia	Ockhom's
Nordic region)	(230	BBG/VS(om)	Essential

Journey Into Chinese Culture Money Morters (a weekly economic report on the Mordic region)
One Planet (stories about the environment, development, ogriculture and human impact on the natural world) People and Places (a forum for the exchange of views and experiences on a global scale) Nordic Report, magazine on Scandinavia (1st week); Generscan, Azarioh Kiros highlights Swedish environmental owarreness (2nd week); Hear Beat, Gaby Katz hosts health and medical magazine (3rd week); The S-Files, Kiris Baswell on the Sweden behind the headlines (4th week)
Discovery (in-depth exploration of ideas and discoveries in science and technology) Ockham's Razas (sharp commentaries on scientific issues) Essential Guide (big issues in global affairs) filtra 13th-Goodbye Village, Hello City-John Pickford on implication of global migration form countryside to town! Earthbeat (Aleandra DeBlas presents a program on en-

tronomy, and Soundbyte, about computers, will be broadcast during the first and last weeks of the month.]

Focus on Faith, Trevor Barnes (religious stories behind the nows)
The Jazz Show (recordings from the Russian world of jazz)

Media Scan (the oldest program of its kind, George Wood on satellite and cyberspace communications, 1st and 3rd

Sports International (the issues and personalities behind

Let's Learn Chinese

R. Austrolia

C245 R. Tipei Int.

4230 BB WS(om)

Thursday #205 8B/WS(am)

0215 R. Taipei Int. R. Sweden

Voise of Russia 4245 R. "weden

weeks)

FREQUENCIES ..

		0330		Thailand, Radio	15460na				0300	0400	vl/as	Solomon Islands, SIBC	5020do			
	0300	0330	0	UK, Wales Radio Intl/Merlin	9735na				0300	0400		Solomon Islands, SIBC	9545do			
		0330		USA, KJES Vado NM	7555na				0300	0400	V1/ U	Sri Lanka, Sri Lanka BC Corp		4075	(120.1	0770
		0330	mtwhf	USA, Voice of America	4960af				0000	0700		15425as	6005as	6075as	6130do	9770as
- 1	0300	0345		Germany, Deutsche Welle	6045na	9535na	9640na	9700na	0300	0400		Taiwan, R Taiwan International	5050	0/00	11745	11005
				11750ng				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0000	0400		15345as		9680na	11745as	11825as
		0345	vl	Libya, Voice of Africa	11815af	15420af			0300	0400		Uganda, Radio	4976do	5026do		
- (0356		China China Radio Internationa						0400		UK, BBC World Service	3255af	5975na	4005-1	/125
- (0300	0400		Anguilla, Caribbean Beacon	6090am					0.00		6175na	6190af	6195eu	6005af 7160af	6135am
- (0300	0400	vl	Australia, ABC/Alice Springs	4835do								11760me			9410eu
(0300	0400	vl	Australia, ABC/Katherine	5025do								15310as		11955me	
		0400	vl	Australia, ABC/Tennant Creek	4910do								21660as	1330008	15420af	17760as
(0300	0400		Australia, Christian Voice	9865va	15185va	17645va	21680va	0300	0400		USA, Armed Forces Radio	4278va	4210	4002	5775
(0300	0400		Australia, Radio	9660pa	12080pg	15240as		"""	0,00		6350va	6458va	4319va 6847va	4993va	5765va
				15515va	17580va	17750as	21725va		1				12689va		10320va	1094040
- (0300	0400	mtwhf	Bhutan, Bhutan BC Service	6035do		2.7.20.0		0300	0400		USA, KAIJ Dallas TX	5755va	13362va	16847va	
(0400	vl	Botswana, Radio	3356do	4820do	7255do		0300	0400		USA, KTBN Salt Lake City UT	7510na			
(0300	0400		Bulgaria, Radio	7400na	9400na	, = 00 00		0300	0400		USA, KWHR Naalehu HI	17510na			
(0300	0400		Canada, CBC Northern Service	9625do				0300	0400		USA, Voice of America		(000 (7105 (7000 /
(0300	0400		Canada, CFRX Toronto ON	6070do				0000	0400		7340af	6035af	6080af	7105af	7290af
(0300			Canada, CFVP Calgary AB	6030do				0300	0400		USA, WBCQ Monticello ME	7415af	9575af	9885af	
(0300	0400		Canada, CHNX Halifax, NS	6130do				0300	0400		USA, WEWN Birmingham AL	7415na 5825va	9335na		
(0300	0400		Canada, CKZN St John's NF	6160do				0300	0400		USA, WHRA Greenbush ME	7580na	7425na		
	300			Canada, CKZU Vancouver BC	6160do				0300	0400		USA, WHRI Noblesville IN	7315sa			
	0300			Costa Rica, Faro del Caribe	5054ca	6175ca	9644ca		0300	0400		USA, WINB, Red Lion PA	12160am			
	300			Costa Rica, R for Peace Intl	7480va	15048va	, , , , , ,		0300	0400		USA, WJCR Upton KY	7490va			
(0300	0400		Costa Rica, University Network	5920al	6970vo	7480va	15048va	0300	0400		USA, WRMI Miami FL	7385am	13595as		
				21815irr				.00.000	0300	0400		USA, WSHB Cypress Crk SC	7535eu			
		0400		Cuba, Radio Havana	6000na	9820na	11705na		0300	0400		USA, WTJC Newport NC	9370na			
		0400		Ecuador, HCJB	9745na	11840na	21455usb		0300	0400		USA, WWCR Nashville TN	3215am	5070	5025	7.425
		0400	a/monthly	Finland, Scandy Weekend Rodio	11690va	11720va			0300	0400		USA, WWFV McCaysville GA	3270va	5070am 5085am	5935am	/435am
		0400		Germany, Voice of Hope	6185na				0300			USA, WYFR Okeechobee FL	6065na	9505na		
		0400	vl	Guatemala, Radio Cultural	3300do	5955do			0300		vl	Vanuatu, Radio	3945do	4960do	7260do	
		0400		Guyana, Voice of	3289do	5949do			0300	0400		Zombia, Christian Voice	6065do	470000	720000	
		0400	sm	Honduras, Radio Luz y Vida	3250ca				0300		vl	Zambia, National BC Corp	6165do	6265do		
		0400		Japan, Radio	17825ca	21610pa			0300	0400	vl	Zimbabwe, Zimbabwe BC Corp		6045do		
	300			Kenya, Kenya BC Corp	4935do				0310	0315		Vatican City, Vatican Radio	7305am	9605am	9660af	
		0400	νl	Lesotho, Radio	4800do				0315	0340		Vatican City, Vatican Radio	9660af	,0000	700001	
		0400		Liberia, Voice of Hope	6280af				0330	0357		Vietnam, Voice of	9795na			
		0400		Malaysia, Radio	7295do				0330	0400		Albania, R Tirana International	6115ng	7160na		
	300			Malaysia, Voice of Islam	6175as	9750os	15295as		0330	0400		Hungary, Radio Budapest	9835na			
	300				3270af	3289af			0330	0400		Myanmar, Radio	9730do			
	300			New Zealand, R New Zealand In					0330			Sweden, Radio	9495na			
		0400		Oman, Radio Sultanate of	15355va				0330			UAE, Radio Dubai		13675na	15395na	15400ne
		0400	VI	Papua New Guinea, NBC	9675do	11880do				0400	f	Seychelles, FEBA Radio	11885af			
		0400			7180na	12020na	13655na	15470na		0400		Uzbekistan, Radio Toshkent	7245as			
U	300	U4UU		Singapore R Corp of Singapore	6150do				0357	0400	vl	Malawi, Malawi BC Corp	5995do			
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SELECTED PROGRAMS

Sun	day	
0300	WWCR(5070kHz.)	Communications World (Kirn Elliott reviews the week in global communications)
0305	R. Austrolia	Correspondents' Report (ABC News reporters background international events)
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 Mascow)
0315	Doutsche Welle	Spectrum (a weekly programme looking at developments in the fields of science and technology)
0320	China R. Int.	In the Spotlight (Chinese arts and cultural magazine)
0330	BBCWS(om)	Science in Action (Richard Black reports news from the worlds of science and technology)
	R. Australia	Feedback (Roger Broadbent answers listener questions and provides regular updates about RA)
	R. Sweden	Weekand, magazine about Europe (1st week); Sweden Today George Wood presents voices of Sweden (2nd week); Sweden with the Sweden (2nd week); Studio 49, ideas and long-term trends in the Nordic region (4th week)
	WWCR(5070kHz.)	World of Radio (Glenn Houser's comprehensive review of the week in international broadcastina)
0332	Voice of Russia	Songs from Russia (melodies from Russia's past)
0340	R. Habono Cuba	Divers Unlimited (Arnie Coro presents a program from radio enthusiasts)
Mon	day	
0300	R. Habana Cuba	Breakthrough (Arnie Coro with a report on science)
0305	R. New Zealand Int.	Tagata a te Maana (Anita Purcell presents a weekly Pa- cific magazine with NZ and regional Pacific news, issues, information and music)
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 Mascow)
0315	Doutsche Welle	Arts on the Air (Breandoin O'Shea covers the German cul- tural scene)
0330	BBCWS(am) R. Hobona Cuba R. Sweden	Assignment (documentaries) From Havana (showcase of contemporary Cuban music) In Touch with Stockholm presented by Nidia Hagström, an interactive listener contact program (1st weekend); Sounds Mordic presented by Gaby Katz, youth music and

		1 0357 0400 VI Malawi,	Malawi
• • •			
		trends magazine (all other weekends)	
0332 0335	Voice of Russia	This is Russia (cities, regions, culture, arts, religion, people)	0311
0340	R. Budapest R. Australia	Heading to Hungary (a monthly travelague) The Australian Music Show (the latest rock music)	
	al acc	, and the state of	0330
0311	Voice of Russia	Science and Engineering (latest developments in science and	
	AOMOR OF WOOZHO	technology)	0332
0315	Radio Taipei Int.	Taiwan Economic Journal	0340
0330	Chino R. Int. Deutsche Welle	Sports World (the sports scene in China and Asia) Insight (a look at major international trends)	0343
0332	Voice of Russia	Kaleidoscope (the latest economic, social and cultural events in	
0340	R. Australia	Russia and the CIS) Music Deli (Folk, acoustic, traditional and world music)	Fric
0345	BBCWS(om)	Analysis (background to the news)	0305
Tues	des Calus	don	0011
0305	day-Satur Doutsche Welle	Newslink (European current affairs magazine)	0311
0330	BBCWS(om)	World Business Report (main business issues of the day)	0330
0335	R. Sweden R. Budggest	Sody Degrees North (reports, interviews and analysis) Hungary Today (a doily magazine covering current events)	
		mondary rooms (a news unadersus cosessis cosess)	
	nesday		0332
0311	Voice of Russia Doutsche Welle	Newmarket (business and int'l business in Russia) Man and Environment (John Hay presents the human element	0345
0000		in environmental issues)	
	R. New Zeoland Int.	Tradewinds (Walter Zwerlet's report on Pacific regional business and economic news)	
0340	R. Austrolia	Blacktrocker (Mal Honess presents contemporary Aboriginal	
	R. Hohona Cuba	music)	
0345	BBCWS(gm)	DXers Unlimited presented by Arnie Coro Analysis (background to the news)	Sat
	R. Sweden	Media Scan (the oldest program of its kind, George Wood on	0305
		satellite and cyberspace communications, 1st and 3rd weeks)	0311
Thur	sday		
0305	R. New Zealand Int.		0332
		developments, projects and programs (fortnightly); Mailbox (program for the serious shortwave listener, with Myra Oh, Paul	0340
		Ormandy, and Adrian Sainsbury with letters, DX news, and tech-	0345
			9973

0311	Voice of Russia	nical topics (formightly) Moscow Mailbag (top-rated program with Joe Adamov answering listener questions and sharing Moscow's latest					
0330	Deutsche Welle R. New Zealand Int.	rumors and jokes) Living in Germany (people, places and events) The World in Sport (Dmitri Edwards presents world's sport- ing week with emphasis on NZ and Pacific)					
0332 0340 0345	Voice of Russia R. Australia BBCWS(am)	ing week with emphasis on NZ and Picchic) Moscow Yesterday and Today (interesting history). DZ Country Style (country music from Australia) From Our Own Correspondent (the background to interna- tional events).					
	R, Sweden	Money Matters (economic report on the Nordic region)					
Frid	ay						
0305	R. New Zealand Int.	Dateline Pacific (major Pacific news stories, presented by Don Wiseman)					
0311	Voice of Russia	Science and Engineering (latest developments in science and technology)					
0330	China R. Int, Deutsche Welle R. New Zealand Int.	Life in China (focus on the lives of ordinary people) Spotlight on Sport (German and European sport) Pacific Correspondent (RNZI's regional correspondents talk to Don Wiseman about political and social issues)					
0332 0340 0345	Voice of Russia R. Austrolia BBCWS(am) R. Sweden	Russian by Radio (a language lesson) Music Deli (folli, acaustic, traditional, world music) Analysis (background to the stories in the news) Mordic Report, magazine on Scandinavia (1st week); Greenscan, Azariah Kiras highlights Swedish environmental awareness (2nd week); Heart Beart, Gaby Katz hosts health and medical magazine (3rd week); The S-Files, Kris Boswell on the Sweden behind the headlines (4th week)					
Sati	ırday						
0305	R. Austrolia	Rural Reporter (news and stories from regional Australia)					

164	ruay	
5	R. Austrolia	Rural Reporter (news and stories from regional Australia)
1	Voice of Russia	Newmarket (Russian and international business)
0	Deutsche Welle	Germon by Radio (a language lesson)
	HCIB Ecuador	Inspirational Classics (classical music selections inspired by religious and spiritual themes)
2	Voice of Russia	Audio Book Club (readings from Russian literature)
D	R. Austrolia	Lingua Franca (Jill Kitson presents language and its social, cultural and historical ramifications)
5	BBCWS(am)	Analysis (background to the news)

Shortwave Guide

0400 UTC

FREQUENCIES

0400 0400 0400 0400 0400	0430 0430		Czech Rep, Radio Prague Intl Belgium, Radio Vlaanderen Intl Mexico, R Mexico International Mongalia, Vaice of Niaeria, Radio/Kaduna	7345na 11985am 9705am 12015as 6090do	7385na 11770am 12085as 7275do	9435na		0400 0400 0400 0400 0400		vi/as vi/a	Singapore R Corp of Singapare Salaman Islands, SIBC Salaman Islands, SIBC Switzerland, Swiss R International Turkey, Voice of	5020do 9545do	9905am 9655as	21715as	
0400 0400	0430	41	S África, Channel Africo Sri Lanka, Sri Lonko BC Corp	5955af 6005as	6075as	6130do	9770as	0400	0500 0500		Uganda, Radio UK, BBC World Service 6135om	4976do 3255af 6175no	5026do 5975na 6190af	6005af 6195eu	6005af 7160af
0400 0400	0455		Germany, Deutsche Welle USA, WYFR Okeechobee FL	7195af 6065no	9565af 9355eu	11935af 9505na	11965af				9410eu	11760me 15420of	11765af	12095of	15280os 17790os
0400	0456 0456			iol 15335	9570na	11830na	15335as	0400 0400	0500 0500		Ukraine, R Ukraine International USA, Armed Force Radio	9610na 4278va	9810na 4319va	9835na 4993va	5765va
0400 0400 0400	0500 0500 0500		Anguilla, Caribbean Beacon Australia, ABC/Alice Springs Australia, ABC/Katherine	6090am 4835da 5025do				0400	0500		USA, KAU Dallas TX	6458va 12689va 5755va	6847va 13362va	10320va 16847va	10940va
0400 0400 0400	0500 0500 0500	γl	Australia, ABC/Tennant Creek Australia, Christian Voice Australia, Radio	4910do 9865va 9660pa	15185va 12080pa	17645va 15240as		0400 0400 0400	0500 0500 0500		USA, KTBN Salt Lake City UT USA, KVOH Los Argeles CA USA, KWHR Naalehu HI	7510no 9975am 17780as			
0400 0400	0500 0500			17580vo 3356do 4850do	17750as 4820do	21725va 7255do		0400	0500		USA, Voice of America 9575af USA, WBCQ Montrcello ME	6080af 9775af 7415na	7170of 9885of 9335na	7290af 15205as	7415af
0400	0500 0500	VI	Canada, CBC Northern Service Canada, CFRX Toronto ON Canoda, CFVP Calgory AB Canoda, CHNX Halifax, NS					0400 0400 0400 0400	0500 0500 0500 0500		USA, WEWN Birmingham AL USA, WHRA Greenbush ME USA, WHRI Noblesville IN USA, WINB Red Lion PA	5825va 7580na 7315sa 12160am	7425na		
0400 0400 0400	0500 0500 0500		Canada, CKZN St John's NF Canada, CKZU Voncouver BC Costa Rico, R for Peace Intl	6160do 6160do 7480va	15048va			0400 0400 0400	0500 0500 0500		USA, WJCR Upton KY USA, WMLK Bethe PA USA, WRMI Miami FL	7490va 7555va 7385am	13595as 9465alt		
0400 0400 0400	0500 0500 0500		Costa Rica, University Network Cuba, Radio Havana Ecuador, HCJB	5920al 6000na 9745no	6970va 9820na 11840na	7480va 11705na 21455usb	15048vo	0400 0400 0400	0500 0500 0500		USA, WSHB Cypress Crk SC USA, WTJC Newport NC USA, WWCR Nashville TN	7535eu 9370na 2390om	12020af 3215am	5070am	5935am
0400 0400	0500 0500	a/monthly	Finland, Scandy Weekend Radio Germany, Unt Methodist Church	11690va n 11775of	11720vo 13685af	2170000		0400 0400 0400	0500 0500	٧l	USA, WWFV McCaysville GA Zambia, Christian Voice Zambia, National BC Corp	3270vo 6065do 6165do	5085am 6265do		
0400 0400 0400 0400	0500 0500 0500 0500		Germany, Voice of Hope Guatemolo, Radio Cultural Guyana, Voice of Kenya, Kenya BC Corp	6185na 3300do 3289do 4935do	5955do 5949do			0400 0400 0425 0430 0430	0500 0440 0457	4 41	Zimbabwe, Zimbabwe BC Corp Italy, RAI International Czech Rep, Radio Prague Intl Iran, VOIRI	4828da 6145af 9865va 9830me	6045do 7120af 11600va 11985me		
0400 0400 0400	0500 0500 0500		Lesotho, Radio Liberia, Voice of Hope Malawi, Malawi BC Corp	4800da 6280af 3380da	5995do			0430 0430	0500 0500		Netherlands, Rodio Nigerio, Rodio/Ibadan	6165no 6050do	9590no	3035 1	05701
0400 0400 0400	0500		Malaysia, Radio Malaysia, Voice of Islam Myanmar, Radio	7295do 6175as 9730do	9750as	15295as		0430 0430 0430	0500 0500	۷l	Nigeria, Radio/Kaduna Nigeria, Radio/Lagos S Africo, Adventist World Radio	4770do 3326do 12080af	6090do 4990do	7275do	9570do
0400 0400 0400 0400	0500 0500	vl	Namibia, Namibian BC Corp New Zealand, R New Zealand I New Zealand, ZLXA Nigeria, Radio/Enugu	3270of nt17675pa 3935do 6025do	3289af 7290do			0430 0430 0430 0430	0500	mtwhfa	S Africa, Trans World Radio S Africa, Trans World Radio Sri Lanke, Sri Lonka BC Corp Swaziland, Trans World Radio	6035af 4775of 6130do 4774af	6035af		
0400			Papuo New Guinea, NBC Russia, Voice of Russia WS	9675do 7125na 15445na	11880do 7180na 15470na		12020na 17595na		0500		USA, WYFR Okeechobee FL	9355eu			

SELECTED PROGRAMS

Sun	day	
0400	BBCWS(orr)	The World Today (the BBC's agenda-setting flagship global news program)
	R. Viconde en Int.	Music from Flonders (a half-hour of Flemish music, musicians and musical performances)
	WHRI(5745kHz.)	Dring with Cumbre (Marie Lamb with the hottest DX catches)
0405	R. Austrolic	Ockham's Razor (sharp commentaries on scientific issues)
	R, New Zepland Int.	Whenua! (Maori cultural magazine)
	R. Progue	Readings from Czech Literature
0410	HCIB Econdor	DX Partyline (Allen Graham hasts a weekly program for DXers and SWLs)
	R. Hobans Cube	The World of Stamps (this just might be the only pro- gram on radio on philatelic matters)
	R. Progue	Saturday Music (Czach classical, folk, jazz or rock mu- sic)
	Swiss R. In [*] .	The Name Game (prizes are offered to listeners who can identify the mystery Swiss location described) [1st Sun, of the month]
0420	China R. Int.	In the Spotlight (Chinese arts and cultural magazine)
0430	BBCWS(om)	Global Business (Peter Day charts the transformations sweeping through the world of work and commerce)
	R. Austrolia	Oz Sounds (diverse music from Australian composers, performers and venues)
0432	Voice of Russia	Kaleidascape (the latest economic, social and cultural events in Russia and the CIS)
0435	R. Netherlands	Europe Unzipped (the events of the past week in Europe, some unusual)
0440	Swiss R. Int.	(repeat of the 0410 program)
Mor	idav	
0400	BBCWS(om)	The World Today (the BBC's agenda-setting flagship global news program)
	R. Vloodneren Int.	Radio World (Frans Vassen presents a weekly report

about international radio)

0430 B8CWS(am)

Westway Compilation (an opportunity to hear again

	China R. Int.	People in the Know (interviews withprominent Chinese who are shaping the nation's future)
0432	Voice of Russia	Audio Book Club (readings from the best of Russian classic and contemporary literature)
0435	R. Netherlands	Sincerely Yours (Veronica Wilson hoe's RN's listener response program)
Mon	day-Friday	
0405	R. New Zealand Inv.	Checkpoint (RNZ National Radio's flagship evening news program)*
0410	R. Australia	The World Today (a comprehensive current affairs program with Monica Attend and John Highfield)
Tues	day	
0405	BBCWS(om)	Omnibus (varied documentaries)
0430	BBCWS(am)	Body and Mind (how health and menicine relate to you) [thru 21'st Health Check-a recurring sories looking at global health and medicine issues.]
	China R. Int.	Sports World (the sports scene in Clina and Asia)
Tues	day-Saturd	av
0410	HCJB Ecuador	Studio 9 (daily magazine with facused reports on Latin America)
0411	Voice of Russia	News and Views (Russian views on news developments)
0430	R.Netherlands	Newsline (news, analysis and background reports)
0445	BBCWS(om)	Off the Shelf (abridged serialized readings of novels, stories and other literature)
Wed	nesday	

0405 BBCSW(am) 0430

BBCWS(am)

both episodes of this radio soap opera broadcast last week)

The Alternative (the "cutting edge" of rock music)
Potherns of Faith (a global exploration of relingious values and human wisdon) [until 13"/14"-Faod for Thoughel-foods that have strong connections with the soul or spirit, including 6"/7"-Cawe, the sacred drink of Mozambique)

0430	3BCWS(om)	lection) Plain English (programs focusing on aspects of language) [thru 20"/29"-The E Files what happens when English is used as an international language]
	-ICIB Ecuador	Hom Radio Today (Graham Bulmer hosts a program for radio amateurs)
Frida	ry .	
0405	3BCWS(om)	Jazzmetazz (this program has had a long run in this time slot, but BBC On Air's listings appear to hint that another program may appear here, at least temporarily)
0430	3BCWS(om) Thing R. Int.	Heart and Soul (global religious and spiritual experiences) Life in China (a weekly magazine focusing on the lives of ordinary people in China)
Satu	-day	
0405	3BCWS(om)	Light Entertainment (a panel game or quiz show usually occupies this slot)
	₹. Australia	Pacific Focus-Environment (the post week's environ- mental news as reported on the weekday magazine, Po- cific Beat)
	R. New Zeoland Int.	Tagata a te Maana (Anita Purcell presents a weekly Pa- cific magazine with NZ and regional Pacific news, issues, information and music)*
0430	3BCWS(am)	Write On (Penny Vine sifts through the listener moil) Waveguide (Richard Lambley with a monthly report of the latest broadcasting news) (aired the third or fourth week of the month in place
	-ICIB Ecuador	of Wirie On] Musica del Ecuador (Jorge Zambrono presents selections of Ecuadorian and Andean music)
("This RN	a program airs one hour	UT later from March 18.)

lection)

The Greenfield Collection (Edward Greenfield plays classical music requests and selections drawn from his own col-

Thursday

3BCWS(am)

0405

Frequencies

0500	0600		New Zealand, ZLXA	3935do	7290do			0530	0600	v	Zimbobwe, Zimbabwe BC Corp	5975do	6045do		
0500 0500 0500 0500	0600 0600 0600 0600 0600		Malaysia, RTM Sarawak Malaysia, Voice of Islam Myonmar, Radio Namibia, Namibian BC Corp New Zeoland, R New Zeoland In	7160do 6175as 9730do 3270af	9750as 3289af	15295as		0525	0600 0600 0600 0600	vl vl smtwhf	Rwanda, Radio Ghano, Ghana BC Corp Italy, IRRS Thailand, Radio UAE, Rodio Dubai UK, BBC World Service	6055do 3366do 3985vo 12015eu 13675ou 17885af	4915do 15435au	21700au	
0500 0500 0500 0500	0600 0600 0600 0600	νl	Liberia, R Liberia International Liberia, Voice of Hope Malawi, Malawi BC Corp Malaysia, Radio	5100do 6280af 3380do 7295do	5995do			0500 0502	0600 0600 0600	vl	Zambia, National BC Corp S Africa, Trans World Radio USA, WWCR Nochville TN	6165do 9500af 2390am	6265do 3210am	5070am	5935am
0500 0500 0500	0600 0600 0600		11760as Kenya, Kenya BC Corp Kuwait, Radio Lesotho, Radio	15150as 4935do 15110va 4800do	17810as	21755pa			0600 0600 0600 0600	vl	USA, WWFV McCaysville GA USA, WYFR Okeechobee FL Vanuatu, Radio Zambia, Christian Voice	3270vo 5985na 3945do 6065do	5085am 9355eu 4960do	11550eu 7260do	
0500 0500 0500	0600 0600 0600		Germony, Unt Methodist Church Guyano, Voice of Japan, Radio	3289do 5975eu	13685af 5949do 6110na		11715os	0500	0600 0600		USA, WRMI Miami FL USA, WSHB Cypress Crk SC USA, WTJC Newport NC	7385am 7535eu 9370no	15195af		
0500 0500 0500	0600 0600 0600	o/monthly	Cuba, Radio Havano Ecuador, HCJB Finland, Scandy Weekend Radio	9550na 9745na 11690va	9820na 11840na 11720va	9830na 21455usb	1304000	0500 0500 0500	0600 0600 0600		USA, WHRA Greenbush ME USA, WHRI Noblesville IN USA, WJCR Upton KY USA, WMLK Bethel PA	7435af 7315sa 7490va 7555va	13595as 9465alt		
	0600 0600 0600 0600		Canada, CKZN St John's NF Canada, CKZU Vancouver BC Costa Rico, R for Peoce Intl Costa Rica, University Network	6160do 6160do 7480vo 5920al	15048va 6970vo	7480va	15048va	0500 0500 0500	0600 0600 0600		USA, WBCQ Monticello ME USA, WEWN Birminghom AL	7415na 5825va	9330na 7425na		
0500 0500 0500 0500 0500	0600 0600 0600 0600	vi	Cameroon, RTV/Yaounde Canada, CBC Northern Service Canada, CFRX Toronto ON Canodo, CFVP Calgary AB Canoda, CHNX Halifax, NS	6070do 6030do 6130do					0600 0600		USA, KTBN Salt Lake City UT USA, KVOH Los Angeles CA USA, KWHR Naalehu HI USA, Voice af America 7295af	7510na 9975am 11565pa 5970af 9700af	17780as 6035af 9775af	6080af 11825eu	7170af 12080af
0500 0500 0500	0600 0600 0600	νl	Australia, Radio 17580va Australia, Radio Botswana, Radio	17750os 3356do	12080pa 4820do	15240as 7255do	15515va	0500	0600		USA, KAIJ Dallas TX	4278va 6458va 12689va 5755va	4319va 6847va 13362vo	4993va 10320va 16847va	5765vo 10940va
	0600 0600 0600 0600	νl	Anguilla, Caribbean Beocon Australia, ABC/Alice Springs Australia, ABC/Katherine Australia, ABC/Tennant Creek	6090am 4835do 5025do 4910do	10000	15240	15515				6195eu 11765af 15360as 17790as	7160af 11940af 15420as 21660os	9410eu 11955pa 15575me	9740as 12095eu 17640af	11760me 15280as 17760as
0500 0500 0500	0545 0556 0559		Germany, Deutsche Welle China China Radio International Canoda, R Canada Internationa	5960na 9560no 19760af	6120na 11850of	9670na 11905me	11795na	0500 0500 0500	0600 0600		Sri Lanka, Sri Lanko BC Corp Swaziland, Trans World Rodio UK, BBC World Service	6130do 6035af 5975na	7200af 6005af	9500af 6175am	6190af
0500 0500 0500 0500 0500	0530 0530 0530 0530 0530	vl	S Africa, Channel Africa Switzerland, Swiss R Internationa Uganda, Radio Votican City, Vatican Radio Zimbabwe, Zimbabwe BC Corp	15215af 19655eu 4976do 9660af	5026do 11625af 6045do	15570af		0500 0500 0500 0500 0500	0600 0600 0600 0600 0600	mtwhfa mtwhfs vl	Russia, Voice of Russia WS S Africa, Trons World Radio Singapore R Corp of Singapore Solomon Islands, SIBC Spain, R Exterior Espona	15595na 12000na 7200as 6150do 5020do 6055na	9545do		
0500 0500 0500 0500	0530 0530 0530 0530	twhfo	Australia, Christian Voice Mexico, R Mexico International Netherlands, Radio S Africa, Adventist World Radio	6165na	15185va 11770am 9590na 6015af	17645va	21680va		0600 0600 0600	v v	Nigeria, Voice of Papua New Guinea, NBC Russia, Voice of Russio WS	7255af 9675do 7125na	15120af 11880do 7180na	12020na	15445no
0500 0500 0500	0515	sm twhfa	USA, WWCR Nashville TN USA, WWCR Nashville TN USA, WWCR Noshville TN Isroel, Kol Israel	2390am 3210am 3215am 6280va	5070am 9435va	5935am 17545va		0500 0500 0500 0500	0600 0600 0600 0600	v v v	Nigeria, Radia/Enugu Nigeria, Radio/Ibadan Nigeria, Radio/Kaduna Nigeria, Rodio/Lagos	6025do 6050do 4770do 3326do	6090do 4990do	7275do	9570do

SELECTED PROCEAUC

JFF	FCIFD L	(UGRAMS
Sun	day	
0500	R. Netherlands	Sound Fountain (interesting topics explored with unique applications of sound)
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)
	Doutsche Welle	Talking Point (European journalists discuss the week's events)
	R. Austrolia	Pacific Review (the weekend edition of the daily regional magazine, Pacific Beat)
	R. New Zealand Int.	Storytime (readings for children)*
	Voice of Nigeria	Link-Up (musical requests and dedications from around the African continent)
0510	R. Jopon	Roundup Asia (interviews and reports highlighting various aspects of the rapidly changing Asian region)
0515	Deutsche Welle	Marks and Markets (DW's weekly financial magazine high- lighting business in Europe)
	Sponish Foreign R.	American Chronicles (America from a Spanish perspective)
0520	China R. Int.	In the Spotlight (Chinese arts and cultural magazine)
0530	R. Australia	In Conversation (Helen Brown talks with the leaders and characters of country Australia)
	Sponish Foreign R.	Spain in the American West (Spanish social and cultural influences on the western U.S.)
	WHRI(5745kHz.)	Diding with Cumbre (Marie Lamb with the hottest DX catches)
0532	Voice of Russia	Moscow Yesterday and Today (recalling the most interest- ing events in the history of the city)
0540	R. Habana Cuba	DKers Unlimited (Amie Coro/program from radio enthusiasts)
Моп	day	
0500	R. Netherlands	Dutch Horizons (Bertine Krol chronicles life in Holland)
0505	Dautsche Welle	Religion and Society (an insight into religious events around the world)
0515	Doutsche Welle	Cool (Erica Gingerich and Anke Rasper present DW's youth

young Europe)
Spanish Foreign R. Entremeses (the food and sites in Spain's regions)

Monday-Friday							
0500	BBCWS(am)	The World Today (the BBC's agenda-setting flagship global news					
	Voice of Nigeria WBCQ	program) Wave Train (contemporary African tunes) Arnos 'n Andy (the classic radio comedy from America's past)					
0510	R. Austrolio	Pocific Beat (one of RA's primary programs, this daily current events and features magazine focuses in on the Pocific island nations)					
0515	R. Jopan	44 Minutes (current affairs magazine about Japan and Asia)					
0530	R. Habana Cuba Voice of Nigeria	The Jazz Place (the very best of Cuban jazz) VON Scope (an in-depth roundup of the news in Nigeria, west Africa and the world)					
0532	Voice of Russia	The Jazz Show (recordings from the Russian world of jazz)					
0545	Spanish Foreign R.	Radio Club (a repeat of Saturday's program)					
Tues							
0500	R. Netherlands	The Research File (a magazine emphasizing the relevance of science to all our lives)					
0511	Voice of Russia	Mascow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and lokes sweeping Moscow)					
0530	Ching R. Int. Doutsche Welle	Sports World (the sports scene in China and Asia) Insight (a look at major international trends and developments)					
Tues	day-Satu	rday					
0500	Spanish Foreign R.	REE's News Service (featuring international, libero-American and national news in-depth, a review of the Spanish press, commentaries and analyses)					
0505	Doutsche Welle	Newslink (daily current affairs magazine facused on Europe)					
0545	Spanish Foreign R.	Spanish Language Course					
Worl	nesday						
0500	HCI8 Ecuador	The Book and the Spade (the latest discoveries and develop-					
		ments in Biblical archaeology)					
	R. Netherlands	Music 52/15 (Mortha 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	Doutsche Welle	Man and Environment (John Hay presents the human ele- ment in environmental issues)
0540	R. Habana Cuba	DXers Unlimited (Arnie Coro presents a program from radio enthusiasts)
Thu	rsday	
0500	R. Hetherlands	The Weeldy Documentary (RN's award-winning sound es- says and in-depth investigations; I Iss/3rdxl. Prince in Permambusco-Dovid Swattling axamines the rise of the Dutch slove trade in the 16° century; 8th/10th-Dutch-Canadian History-with Martha Howley; 15th/17th-Sax, Saris and Screens-Jonathan Groubert explains the formulas, rules and symbols of the immensely popular Indian film indus- try; 22nd/24th-Cinema Diaspore-Jonathan Grobert looks at the influence of Indian films on Indians who have never level in India.
0511	Voice of Russia	Newmorket (news about business in Russia and Russia's involvement in international business)
0530	Doutsche Welle	Living in Germany (people, places and events in Germany)
0532	Voice of Russia	Folk Bax (music drawn from the traditions of the hundreds of nationalities that make up Russia and the (25)
Frie	lay	
0500	HCIB Ecuador	Inspirational Classics (classical music selections inspired by religious and spiritual themes)
	R. Netherlands	Encore (replaying the best programs from RN's archives)
0511	Voice of Russia	Moscow Mailbag (see Tuesday's 0511 listing)
0530	China R. Int.	Life in China (a weekly magazine focusing on the lives of ordinary people in China)
	Deutsche Welle	Spotlight on Sport (weekly report on German and European sport)

sport)
R. New Zealand Int. The Pacific Report (a report on trends and events in the Pa-

cific region)*

Continued on page 57

0530 China R. Int.

magazine with reports on the attitudes, music and style of

People in the Know (interviews with prominent Chinese who are shaping the nation's future)

Shortwave Guide

0600 UTC

FREQUENCIES

0600 0600 0600	0615 0615 0620		Canada, CBC Northern Service S Africo, Trans World Rodio Voticon City, Voticon Radio	9625do 11640af 4005eu	5883eu	7250eu		0600	0700 0700 0700		Nigeria, Voice of Popuo New Guinea, NBC Romania, R Romania International	7255af 9675do 9530no	15120af 11880do 11830na		
0600	0629		Canada, R Canada Internationa		6150eu	9780eu		0600	0700		Russia, Voice of Russia WS	15460ou	15470au	15525αυ	17570au
0600	0630 0630		S Africa, Channel Africa Switzerland, Swiss R International	15215af				0600	0700	mtwhf	S Africa, Trans World Radio	21790au 6035af			
0600			USA, Voice of America	5970af	5995af	6035af	6080af	0600	0700		S. Africa, Trans World Radio	7200af	9500af		
			7170af	7295of	11805af	11825eu	11930af	0600	0700		Sierra Leone, Sierra Leone BS	3316do			
0600	0645		12080af Germany, Deutsche Welle	15205as 7225of	15600af 9565af	11785af		0600		υl	Singapore R Corp of Singapore Solomon Islands, SIBC	5020do	9545do		
0600	0700		Anguilla, Caribbean Beocon	6090am	750501	1170301		0600		*1	Sri Lanka, Sri Lanka BC Corp	6130do	734300		
0600			Australia, ABC/Alice Springs	4835do				0600			Swaziland, Trans World Radio	6035af	7200af	9500af	
0600	0700 0700		Australia, ABC/Katherine	5025do 4910do				0600			Uganda, Radio UK, BBC World Service	5026do 6055af	7110do 6175am	7196do 6190af	6195eu
0600	0700	VΙ	Australia, ABC/Tennant Creek Australia, Radio	9660pa	12080pa	15240as	15415os	0000	0700		7160af	9410eu	9580pa	9740as	11760me
0000	0,00			17580as	17750as	21725va					11765af	11940af	11955pa	12095eu	15310as
0600	0700		Botswana, Radio	7255do	9600do	7255do						15420af	15420af	15575me	17640af
0600	0700 0700	٧l	Cameroon, RTV/Yaounde Canoda, CFRX Toronto ON	4850do 6070do				0600	0700		USA, Armed Forces Radio	17790as 4278va	17885af 4319va	21660as 4993va	5765vo
0600	0700		Canada, CFVP Calgary AB	6030do				0000	0700		6350va	6458va	6847va	10320va	10940va
0600	0700		Canada, CHNX Halifox, NS	6130do								12689va	13362va	16847va	
0600	0700		Canada, CKZN St John's NF	6160do					0700 0700		USA, KAIJ Dallas TX USA, KTBN Salt Lake City UT	5755va 7510na			
0600	0700 0700		Canada, CKZU Vancouver BC Costa Rico, R for Peace Intl	6160do 7480va	15048va				0700		USA, KVOH Los Angeles CA	9975am			
0600	0700		Costa Rica, University Network	5920al	6970va	7480va	15048irr				USA, K₩HR Naalehu HI	11565pa	17780os		
0600	0700		Cuba, Radio Havana	9550na	9820na	9830na		0600			USA, W3CQ Monticello ME	7415na	7.05		
0600	0700 0700	o/monthly	Ecuador, HCJB Finland, Scandy Weekend Radio	9745na	11840na 11720va	21455usb		0600			USA, WEWN Birm ngham AL USA, WHRA Greenbush ME	5825vo 7435af	7425na		
0600	0700	o/monthly	Germany, Deutsche Welle	6140eu	1172070				0700		USA, WHRI Noblesville IN	7315so			
0600			Germany, Overcomer Ministries		13810au			0600	0700		USA, WICR Upton KY	7490va	13595as		
0600	0700	vl	Ghana, Ghana BC Corp	3366do	4915do						USA, WMLK Bethel PA	7555va	9465alt		
0600	0700 0700	ul.	Guyana, Voice of Italy, IRRS	3289do 3985va	5949do			0600	0700 0700		USA, WRMI Miomi FL USA, WSHB Cypress Crk SC	7385am 7535af			
0600		ΨI	Japan, Radio	9685po	7230eu	11740as	15195as		0700		USA, WTJC Newport NC	9370na			
			21755pa								USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0600	0700 0700		Kenya, Kenya BC Corp Kuwait, Radio	4935do 15110va							USA, WWFV McCaysville GA USA, WYFR Okeechobee FL	3270va 5985na	5085am 7355eu		
0600		vl	Lesotho, Radio	4800do						νl	Vanuotu, Radio	3945do	4960do	7260do	
0600	0700	νI	Liberia, ELWA	4760do				0600	0700		Yemen, Rep of Yemen Radio	9780do			
0600		٧l	Liberia, R Liberia International	5100do					0700		Zambia, Christian Voice	9865do	43454-		
0600	0700 0700	vl	Liberia, Voice of Hope Malawi, Malawi BC Corp	6280af 3380do	5995do			0600	0700 0700	vI vI	Zambia, National BC Corp Zimbabwe, Zimbabwe BC Corp	6165do 5975do	6265do 6045do		
	0700	*1	Malaysia, Radio	7295do	377300			0610		mtwhf	Greece, Voice of	7475eu	9420eu	11900au	15630eu
0600			Moloysia, RTM Sarawak	7160do				0.115	0.00		6.46	17520me			
0600	0700		Maloysia, Voice of	6175as 9730do	9750as	15295as		0615	0630 0700	0	S Africa, Trans World Radio USA, Voice of America	11640af 5995af	7170 of	11825eu	1193006
0600	0700		Myanmar, Rodio Nomibia, Namibian BC Corp	3270of	3289af			0030	0700		OSA, FOICE OF ARTERICS	15205as	71700	1102560	1770001
0600			New Zealand, ZLXA	3935do	7290do			0630	0700	as	USA, Voice of America	5970af	6035af	6080af	7295af
0600	0700		Nigeria, Radia/Enugu	6025do				0/20	0700		V C'2 V B 1	11805af	12080af	15600af	
0600	0700		Nigeria, Radia/Ibodon Nigerio, Radio/Kaduno	6050do 4770do	6090do	7275do	9570do	0630			Voticon City, Vatican Radio Romania, R Romanio International	11625af 6135eu	13765af 7105eu	15570af 9510eu	11940eu
	0700		Nigeria, Radio/Lagos	3326do	4990do	. 2, 000			2000						

SELECTED PROGRAMS

0610 R. Habana Cuba

BBCWS(cm)

R. Habana Cuba R. New Zeoland Int.

WWCR(3215kHz.)

0625 R. Japan

0630

Sun	day	
0600	BBCWS(a 11)	The World Today (the BBC's agenda-setting flagshi
0605	R. Austral a	global news program) Pacific Focus-Arts (the week's arts and cultural news (reported on the daily magazine, Pacific Beat)
0610	R. Japon	Weekend Square (a program designed to present ver ous aspects of Japon in a friendly and relaxed attrac sphere with interviews, music and discussions)
0630	BBCWS(am)	Agenda (the ideas and trends shoping our world)
	R. Austrolia	Correspondents' Report (ABC News reporters backgroun international events)
	R. New Zealand Int.	This Week in Parliament (a weekly roundup of NZ political news)*
Mon	day	
0600	BBCWS(am)	The World Today (the BBC's agenda-setting flagshiglobal news program)
	R. Hobona Cuba	Breakthrough (Arnie Coro with a report on science)
	Voice of Aigeria	This Week on YoM (a preview of some the coming week programs to be broadcast on Voice of Nigeria)
	WWCR(3215kHz.)	World of Radio (Glenn Houser's comprehensive revie of the week in shortwave and international broadcas inn)

	day-Friday		06
0605	R. New Zealand Int.	The Best of IGm Hill (the best in erviews by NZ's premier current events interviewer)	06
0615	R. Japan	Asian Top News (the day's major stories as reported by the region's radio stations)	06
		region 3 toda arananay	F
Tues	day		06
0605	BBCWS(am)	Maridian-Masterpiece (critical examinations of creative en- deavors)	06 06
0625	R. Jopan	Let's Try Japanese (a Japanese language lesson for begin- ners)	
0630	BBCWS(am)	Light Entertainment (a panel game or quiz show usually oc- cupies this slot)	06
	R. New Zeoland Int.	Spectrum (a weekly look at the people, places and events around NZ)	S
0640	R. Austrolia	Music Deli (Australian performances of folk, acoustic, tradi- tional and world music)	06 06
Wed	nesday		
0605	8BCWS(om)	Meridian-Ideas (a series that expores "big" cultural ideas)	
0625	R. Japan	Unforgettable Musical Masterpieres (a focus on Japanese	
		pop songs written in the post wa years as a means of ex-	06
0630	BBCWS(am)	plaining Japanese history and attitudes) The Music Mix (insights into curren: popular music) [thru 28*-	UO
0630	BBCM2(mm)	Blues World-Tany Russell looks back at blues' heritage	06
	R. New Zeoland etc.	and plays the best of the new? Musical Chairs (the music and ba-kground of a featured NZ	
	N. New Zepliand 411.	unraiciou),	
0640	R. Australia	Blockrocker (Mal Honess present: contemporary Aboriginal	(*1

The Australian Music Show (the letest rock music from the

Triple J youth network of the ABC)

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	0605			CWS(inte	mati	ional	an	вта]						, ,	ort on
	0625			Japar				nes	a)					•					se in	Japa-
	0630			New		nd b	nt.		okma											
	0640		R.	Austr	olia			0z	Coun	try S	tylo	(cou	intry	mud	sic fr	om /	lustn	alia)		
	Fri	da	y																	
	0605		BB	CWS	om)			Mo	sic Ro	wiev	v (d	ossio	n loc	iusic	печ	rs on	d for	dure	s)	
	0625		R.	Joper	1			Mu	sic Bo	eat (i	comi	emp	orar	y Jaj	one	se p	opuli	or mi	rsic)	
	0630		BB	CWS	om)			Om	nibus	s (vo	ried	doc	ume	ntari	es)					
			R.	New .	Zeolo	nd li	nt.		orts S comp				er loc	ok at	the	peop	ole a	nd is:	sues l	behind
	0640		R,	Austr	alia				sic Di nol ar					riom	nonc	es ol	folk	, 000	ustic,	trodi-
	Sa	tı	rd	lay	,															
	0600		W	HRI				Dai	ng wi	ith G	umb	ro (A	Aorie	Lon	ıb w	ith th	ne ho	flest	DX co	rtches)
	0605		88	CWS	(om)			Me noi	ridior ism, l	n-Wri biogr	iting raph Mon	y, hi +Ros	port: story armo	on and ry H	boo ont artil	ks, 1 hopo	heat logy ets a	re, p (thr uthor	oetry u 10	iour- -Writ- o iden-
			R.	New .	Zeolo	ind li	nt.		urday sic se										us' fi	avorite
	0610		R.	Japa	n				unduj iects										ing v	rorious
	0630		88	CWS	(am)				rld ol 1-We:						lk, r	ion-l	Nesh	em d	lassia	al and
			R.	Austr	alia				s Talk al ide		lie C	opei	and	pres	ents	the :	world	l of a	rts or	nd cul-

0700 UTC

2:00 AM EST 1:00 AM CST 11:00 PM PST

Shortwave Guide

3:00 AM EST 2:00 AM CST 12:00 AM PST 0800 UTC

FREQUENCIES .

LKEGOENCIE?												
0700 0705 0 0700 0715 0 0700 0720 0 0700 0720 0 0700 0730 mtwhfa 0700 0730 0 0700 0730 0 0700 0730 mtwhf 0700 0735 mtwhf 0700 0745 os	New Zealand, R New Zealand Int 1767 Greece, Vaice of 9375 S Africa, Trans World Radia 7200 Swaziland, Trans World Radia 6033 Malta, Vaice of Mediterranean 7010 Stovakia, R Slovakia International USA, Vaice of America 6873 S Africa, Trans World Radio 6033 UK, BBC World Service 1788	5eù 11900au Oaf 9500af 5af 7200af Deu 11880do 50au 17550au 3va 5af 9500af	17520me 9500af 21705au		0800 0800 0800 0800 0800 0800 0800 080	0830 0830 0830	vl	Malawi, Malawi BC Carp Malaysia, Vaice of Czech Rep, Radio Prague Intl Australia, ABC/Kaice Springs Australia, ABC/Katherine Australia, ABC/Tennant Creek Belgium, Radio Vlaanderen Intl Myanmar, Radio Anguilla, Caribbean Beacon	3380da 6275as 11600eu 4835da 5025da 4910da 5985eu 9730da 6090am	5995da 9750as 15255eu	15295as	
0700 0745 0700 0756 0700 0800 vl 0700 0800 vl 0700 0800 vl	USA, WYFR Okeechobee FL 7355 Romania, R Romania International 1772 Anguillo, Caribbean Beacon 6090 Australia, ABC/Alice Springs 4833 Australia, ABC/Kotherine 5022	20af 21480af Dam 5do 5do	11850eu		0800 0800 0800		mtwhf vl	Australia, Radio 8hutan, Bhutan BC Service 8otswana, Radio	5995pa 13605va 21725va 6035do 7255do	9580va 15240va 9600do	9710as 15415as 7255do	12080pa 17750as
0700 0800 vl 0700 0800 vl 0700 0800 vl 0700 0800 vl 0700 0800 0700 0800 0700 0800	Australia, ABC/Tennant Creek 491C 966C 966C 177580va 177580va 177580va 1775 6000 6000 6000 6000 6000 6000 6000 6	0pa 12080pa 50as 21725va 5da 9600da 0da 0da 0da	15240as 7255do	15415as	0800 0800 0800 0800 0800 0800 0800	0900 0900 0900 0900 0900 0900 0900		Cameroon, RTV/Yaounde Canada, CFRX Toronto ON Canada, CFVP Calgary AB Canada, CHNX Halifax, NS Canada, CKZN St John's NF Canada, CKZN St John's NF Canada, CKZU Vancouver BC Costa Rica, R for Peace Intl	4850do 6070do 6030do 6130do 6160do 6160do 15048va	70000	723300	
0700 0800 0700 0800 0700 0800 0700 0800 0700 0800 mtwhf 0700 0800 as/vl	Canada, CKZU Vancouver BC Costa Rica, R for Peace Intl Costa Rica, University Network Ecuador, HCJB Eqt Guinea, Radio Africa 151E Eqt. Gunnea, Radio East Africa	0do 0va 15048va 0al 6970va 0eu 11755pa 35af	7480va 21455usb	15048irr	0800 0800 0800 0800 0800 0800		mtwhf as/vl a/monthly	Costo Rica, University Network Ecuador, HCJB Eqt Guinea, Radio Africa Eqt. Guinea, Radio East Africa Finland, Scandy Weekend Radii Germany, Deutsche Welle	5920al 9780eu 15185af 15185af 11690va 6140eu	6970va 11755pa 11720va	15048irr 21455usb	
0700 0800 a/monthl 0700 0800 0700 0800 0700 0800 as 0700 0800 vl 0700 0800 vl 0700 0800 vl 0700 0800	, Finland, Scandv Weekend Radio 1165 Germany, Deutsche Welle 614 Germany, Overcomer Ministries 943(Germany, Trans World Radio 120) Germany, Voice of Hope 5975 Ghana, Ghana BC Corp 3366 Ghana, Ghana BC Corp 3366 Guyana, Voice of 3288	Deu Dpa 13810au 70eu 5eu 21590me 5do 4915do 6do 4915do			0800 0800 0800 0800 0800 0800 0800	0900 0900 0900 0900 0900 0900 0900	vl as	Germany, Overcomer Ministree Germany, Trans World Rodio Germany, Voice of Hape Ghana, Ghana BC Corp Guam, Trans World Radio Guyana, Voice of Indonesia, Voice of	12070eu 12070eu 5975eu 3366do 15200as 3289do 9525va	13810pa 21590me 4915do 15330as 5949do 11785va	15149va	
0700 0800 vi/mtwhf 0700 0800 0700 0800 vi 0700 0800 vi 0700 0800 vi 0700 0800 vi 0700 0800 vi 0700 0800 vi 0700 0800 vi	Italy, IRRS 712C Kenya, Kenya BC Corp 4935 Kuwait, Radio 1511 Lesotho, Radio 480C Liberia, ELWA 1510C Liberia, R Liberia International Liberia, Voice of Hope 628C Malawi, Malawi BC Corp 3380 Malayio, Radio 7295	5do 1 Ova Odo Odo Odo Oaf Odo 5995do			0800 0800 0800 0800 0800 0800 0800	0900 0900 0900 0900 0900 0900 0900	vI/as vI vI vI	Italy, IRRS Kenya, Kenya BC Corp Lesotho, Radio Liberia, ELWA Liberia, R Liberia International Libera, Voice of Hope Malaysia, Radio Monaco, Trans World Radio	7120va 4935do 4800do 4760do 5100do 6280af 7295do 9870eu			
0700 0800 0700 0800 0700 0800 0700 0800 0700 0800 0700 0800 vl	Malaysia, RTM Sarawak 716C Malaysia, Vaice of 6275 Myanmar, Radio 9730 Nomibia, Namibian BC Corp 327C New Zealand, ZIXA 3935 Nigeria, Radio/Enuqu 6025)do 5as 9750as)do)af 3289af 5do 7290do	15295as		0800 0800 0800 0800 0800 0800	0900 0900 0900 0900 0900 0900	vl	Namibia, Namibian BC Corp New Zealand, R New Zealand I New Zealand, ZIXA Nigeria, Radio/Enugu Nigeria, Radio/Ibadan Nigeria, Radio/Kaduna	7165af nt15175pa 3935do 6025do 6050da	7215af 7290do	70754-	05704-
0700 0800 vl 0700 0800 vl 0700 0800 vl 0700 0800 0700 0800 0700 0800	Nigeria, Radio/Ibadan 6050 Nigeria, Radio/Kaduna 4770 Nigeria, Radio/Lagos 3326 Palau, KHBN/Voice of Hope Russia, Voice of Russia WS 1546 Sierra Leone, Sierra Leone BS 3316 Singapore R Corp of Singapore 6150	0do 6090do 6do 4990do 6do 49985as 60au 17570au 6do	7275do 15725as 17655au	9570do 21790au	0800 0800 0800 0800	0900 0900 0900 0900	vl vl	Nigeria, Radio/Lagos Palau, KHBN/Voice of Hope Papuo New Guinea, N8C Russia, Voice of Russia WS	4770do 3326da 9955os 4890da 9905au 17525au	6090do 4990do 9965as 9675do 15460au 17570au	7275da 9985as 15470au 17655au	9570do 15725as 17495au
0700 0800 vl 0700 0800 0700 0800 0700 0800 0700 0800 0700 0800	Solomon Islands, SIBC 5020	0do 9545do 0da 9680na 0da 7110do 0da 6190af 00me 11765af 10as 15360as	11745as 7196do 9410eu 11940af 15400af	9580pa 11955pa 15485ey		0900 0900 0900 0900 0900 0900	s v	S Africa, Amaleur Radio League Sierra Leone, Sierra Leone BS Singapore R Corp of Singapore Salomon Islands, SIBC South Karea, R Kare Intl Sri Lanka, Sri Lanka BC Carp Uganda, Radio	3316do 6150do 5020do 9570va 6130do 5026do	21560af 13670va 7110do	7196do	
0700 0800 0700 0800	15565eu 1764 21660as USA, Armed Forces Radio 4278 6350va 6458 12579va 1268 USA, KAIJ Dallas TX	3va 4319va 3va 6847va 39va 13362va	17790os 4993va 10320va 16847va	17830af 5765va 10940va	0800	0900	as	UK, BBC World Service UK, BBC World Service	15400af 17760as 15575os	9410eu 12095eu 15485eu 17830af 17885of	15310as 15565eu	11940af 15360as 17640eu 21830me
0700 0800 0700 0800 0700 0800 0700 0800 0700 0800	USA, KTBN Salt Lake City UT 7510 USA, KWHR Naalehu HI 1156 USA, WEWN Birminghom AL USA, WHRA Greenbush ME 7435 USA, WHRI Noblesville IN 7315	Ina 5pa 17780as ivo 7425na iaf isa			0800	0900		USA, KAIJ Dallas TX	4278va 6350va 10940va 16847va 5755va	4319va 6458va 12579va	4993va 6847va 12689va	5765va 10320va 13362va
0700 0800 0700 0800 0700 0800 0700 0800 0700 0800 0700 0800 0700 0800 0700 0800 vl	USA, WJCR Uptan KY 7490 USA, WMLK Bethel PA 7555 USA, WRMI Miamı FL USA, WSHB Cypress Crk SC 7535 USA, WTJC Newport NC 9370 USA, WWCR Nashville TN 2390 USA, WWFV McCaysville GA 3270 Vanuatu, Radio 3945	ova 9465alt com caf ona oam 3210am ova 5085am	5070am 7260do	5935am	0800 0800 0800 0800 0800 0800 0800	0900 0900 0900 0900 0900 0900 0900		USA, KNLS Anchor Point AK USA, KTBN Solt Lake City UT USA, KWHR Naalehu HI USA, Voice of America USA, WEWN Birmingham AL USA, WHRA Greenbush ME USA, WHRI Nablesville IN	11995as 5825va 7435af 7315so	17780as 13615as 7425na	15150as	
0700 0800 0700 0800 vl 0700 0800 vl 0705 0800 0710 0715 mtwhf	Zambia, Christian Voice 9865 Zambia, National BC Corp 6165 Zimbobwe, Zimbobwe BC Corp 5975 New Zealand, R New Zealand In1517 Vatican City, Vatican Radia 4005 11740eu 1559	da 6265do da 6045da '5pa eu 5883eu '5eu	6185eu	9645eu	0800 0800 0800 0800 0800 0800	0900 0900 0900 0900 0900 0900		USA, WJCR Upton KY USA, WMLK Bethel PA USA, WRMI Miami FL USA, WSHB Cypress Crk SC USA, WTJC Newport NC USA, WWCR Nashville TN	7490va 7555va 7385am 7535eu 9370na 2390am	13595as 9475alt 9845pa 3210am	5070am	5935am
0720 0735 smtwhf 0730 0740 as 0730 0758 0730 0800 vl 0730 0800 vl 0730 0800 0740 0800 0745 0755 os	Swaziland, Trans World Radio 1533 Guam, Trans World Radio 1533 Finland, YLE/R Finland 9510 Austria, R Austria International 6155 Papua New Guinea, NBC 4890 Switzerland, Swiss R International 9885 Guam, Trans World Radio 1520	iof 7200af i0as Iva 21670va ieu 13730eu Ido 9675da iaf 13635af	9500af 17665af		0800 0800 0800 0800 0800 0815 0830 0830	0900 0900 0900 0900 0900 0900 0900	vl vl f	Vanuati, Radio Zambia, Christian Vaice Zambia, Christian Vaice Zambia, National BC Corp Zimbabwe, Zimbabwe BC Corp Seychelles, FEBA Radia Australia, ABC/Alice Springs Australia, ABC/Katherine	3945da 9865da 6165da 5975da 15460as 2310da 2485da	4960da 6265da 6045da	7260da	2703UIII
0745 0800 as 0750 0800 as 0755 0800 mtwhf 0755 0800	Monaco, Trans World Rodio 9870 UK, BBC Warld Service 1557 Greece, Vaice of 9375 Germany, Trons World Rodio 9870	5as 17885af eu 11900au Oeu	17520me		0830 0830	0900 0900 0900	vl	Australia, ABC/Tennont Creek Switzerland, Swiss R Internationa Toiwan, CBS	2325do	21770of		

0900 UTC

4:00 AM EST 3:00 AM CST 1:00 AM PST

Shortwave Guide

5:00 AM EST 4:00 AM CST 2:00 AM PST

1000 UTC

FREQUENCIES ...

LKEGOENCIE2		• • • •					• • •						
0900 0915 vl	Ghana, Ghana BC Corp	3366da	4915do			1000	1027		Vietnam, Voice of	9839as	12019as		
0900 0915 0900 0920	Guam, Trans Warld Rodio Monaço, Trans World Radio	15200as 9870eu	15330as			1000	1029		Czech Rep, Radio Prague Intl Guam, Adventist World Radio	21745va 15330as			
0900 0930	UK, BBC World Service	6195os	9605os	9740as	11760me	1000	1030		Singapore, RTE Radio	11740au			
		11945as	11955pa	12095eu	15190sa	1000	1030		Sri Lonka, Sri Lanka BC Corp	4940do	12720-		
		15360as 17640eu	15400af 17760os	15485eu 17790as	15565eu 17830of	1000	1045	0	Austria, R Austria International Chino Chino Radio Internationa	6155eu 11675pg	13730eu 11730pa	15210pa	
	17885af	21470af	21660as			1000	1100		Anguilla, Caribbean Beacon	11775am			
0900 0945	Germany, Deutsche Welle	6140eu	6160po	11785of	12055as	1000		vl	Austrolia, ABC/Alice Springs	2310do			
		17770va 21560af	17800af	17820pa	1/04300	1000		vl vl	Australia, ABC/Katherine Australia, ABC/Tennant Creek	2485do 2325do			
0900 0956	China China Rodio Internationa		11730po	15210pa		1000	1100	**	Australia, Radio	9580va	13605va	17750as	21820va
0900 1000	Anguilla, Caribbean Beacon	6090am				1000	1100		Bhutan, Bhutan BC Service	6035do	04004	30551	
0900 1000 vI 0900 1000 vI	Australia, ABC/Alice Springs Australia, ABC/Katherine	2310do 2485do				1000	1100	vl vl	Botswano, Radio Cameroon, RTV/Yaounde	7255do 4850do	9600do	7255do	
0900 1000 vl	Australia, ABC/Tennant Creek	2325do				1000	1100	*1	Canada, CFRX Toronto ON	6070do			
0900 1000 0900 1000 as	Australia, Radio Australia, Radio	9580va 15400as	13605va 17750as	21820vo		1000	1100		Conodo, CFVP Calgary AB	6030do			
0900 1000 as 0900 1000 vl	Botswana, Radia	7255do	9600do	7255do		1000	1100 1100		Canada, CHNX Halifox, NS Canada, CKZN St John's NF	6130do 6160do			
0900 1000 vI	Cameroon, RTV/Yaaunde	4850do				1000	1100		Canada, CKZU Vancouver BC	6160do			
0900 1000 0900 1000	Canada, CFRX Taranto ON Canada, CFVP Calgary AB	6070do 6030do				1000	1100		Costa Rica, R for Peace Intl	15048va 5920al	6970va	15048ırr	
0900 1000	Canada, CHNX Halifax, NS	6130do				1000	1100		Costa Rica, University Network Ecuador, HCJB	11755pa	21455usb	13040111	
0900 1000	Canada, CKZN St John's NF	6160do				1000	1100	mtwhf	Eqt Guinea, Radio Africa	15185af			
0900 1000 0900 1000	Canada, CKZU Vancouver BC Casta Rica, R for Peace Intl	6160do 15048va				1000	1100	os/vl a/monthly	Eqt. Guineo, Radio East Africa Finland, Scandy Weekend Radio	15185af	11720va		
0900 1000	Costa Rica, University Network	5920al	6970va	15048irr		1000	1100	0/1110/111114	Germany, Deutsche Welle	6140eu	1172040		
0900 1000 0900 1000 mtwhf	Ecuador, HCJB Egt Guinea, Radio Africa	11775pa 15185of	21455usb			1000	1100		Germany, Voice of Hope	21590me	.0151		
0900 1000 miwii	Eqt. Guineo, Rodio East Africa	15185of				1000	1100	vl vl/or	Ghana, Ghana BC Corp Ghana, Ghana BC Corp	6130do 4915do	4915do 4915do		
0900 1000 a/monthly			11720vo			1000	1100	*1/03	Guam, Adventist World Radio	11660as	471300		
0900 1000 0900 1000 a	Germany, Deutsche Welle Germany, Good News World R	6140eu 5985eu	5995eu			1000	1100		Guyana, Voice of	5949do	10700	15000	17.05
0900 1000	Germany, Trans World Radio	12070eu	077000			1000	1100		India, All India Radio	11585as 17840au	13700ou 17895ou	15020as	17485ou
0900 1000	Germany, Voice of Hope	21590me	50401			1000	1100	vl/as	Italy, IRRS	7120va	1707500		
0900 1000 0900 1000 vl/as	Guyana, Voice of Italy, IRRS	3289do 7120va	5949do			1000	1100		Japan, Radio	9695as	15590as	21755pa	
0900 1000	Kenya, Kenya BC Corp	4935do				1000	1100	ul	Kenya, Kenya BC Corp Lesotho, Radio	4935do 4800do			
0900 1000 vl	Lesatho, Radio	4800do 4760do				1000		vl	Liberio, ELWA	4760do			
0900 1000 vl 0900 1000 vl	Liberia, ELWA Liberia, R Liberia International	6100do				1000	1100	٧l	Liberia, R Liberia International	6100do			
0900 1000	Liberia, Voice of Hope	6280of				1000	1100		Liberia, Vaice of Hope Malaysia, Radio	11530af 7295do			
0900 1000 0900 1000 s	Malaysia, Radio Malta, Voice of Mediterranean	7295do 11770eu				1000	1100		Namibia, Namibian BC Corp	7165af	7215af		
0900 1000		7165af	7215af			1000	1100		Netherlands, Radio	7260va	9790va	12065va	
0900 1000	New Zealand, R New Zealand I		7000			1000	1100		New Zealand, R New Zealand I New Zealand, ZLXA	3935do			
0900 1000 0900 1000 vI	New Zealand, ZLXA Nigeria, Radio/Enugu	3935do 6025do	7290do			1000	1100		Nigeria, Radio/Enugu	6025do			
0900 1000 vI	Nigeria, Radio/Ibadan	6050do				1000	1100		Nigeria, Radio/Ibadan	6050do 4770do	6090do	7275do	9570do
0900 1000 vl 0900 1000 vl	Nigeria, Rodio/Kaduna Nigeria, Rodio/Lagos	4770do 3326do	6090do 4990do	7275do	9570do	1000	1100		Nigeria, Radio/Kaduna Nigeria, Radio/Lagos	4990da	7285do	727300	737000
0900 1000 VI	Palau, KHBN/Voice of Hope	9955as	9965as	9985as	T5725as	1000	1100	vl	Nigeria, Voice of	7255af	15120af	0005	15705
0900 1000 vl	Papua New Guinea, NBC	4890do	9675do	15 4 70	T7405 -	1000	1100	vl	Palau, KHBN/Voice of Hope Papua New Guinea, NBC	9955os 4890do	9965as 9675do	9985as	15725as
0900 1000	Russia, Voice of Russia WS 17525au	9905au 17570au	15460au	134/000	17495ou	1000	1100		Seirro Leone, Sierro Leone BS	5980do			
0900 1000	Sierra Leane, Sierra Leane BS	3316do				1000	1100	vl	Singapore R Corp of Singapore Solomon Islands, SIBC	6150do 5020do			
0900 1000 0900 1000 vl	Singapore R Corp of Singapore Solomon Islands, SIBC	6150do 5020do				1000	1100	AI	Ugando, Rodio	5026do	7110do	7196do	
0900 1000	Sri Lanka, Sri Lanka 8C Cosp	6130do				1000	1100		UK, BBC World Service	6195va	9740os		11955pa
0900 1000	Ugondo, Rodio	5026do 6190of	7110do 11940af	7196do						12095eu 15565eu	15310as 15575as	15360as 17640eu	15485eu 17760as
0900 1000 as 0900 1000	UK, BBC World Service UK, Merlin Network One	6130eu	1174001							17790os	21470af	21660as	
0900 1000	USA, Armed Forces Radio	4278va	4319vo	4993va	5765va			mtwhfo	UK, B8C World Service	17885af	15400~6	17830af	
	6350va 12579va	6458va 12689va	6847va 13362va	10320vo 16847vo	10940va		1100		UK, BBC World Service UK, B8C World Service	15190sa 6190af	15400af 11940af	1703001	
0900 1000	USA, KAIJ Dallas TX	5755vo				1000			USA, Armed Forces Radio	4278vo	4319vo	4993vo	5765vo
0900 1000 0900 1000	USA, KTBN Salt Lake City UT USA, KWHR Noalehu HI	7510na 11565pa	17780as							6350va 10940va	6458va 12579va	6847vo 12689vo	10320va 13362vo
0900 1000 0900 1000	USA, Voice of America	11995as	13615as	15150as						16847va	120//10	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1000210
0900 1000	USA, WEWN Birmingham AL	5825vo	7425no				1100		USA, KAIJ Dollas TX	5755vo			
0900 1000 0900 1000	USA, WHRA Greenbush ME USA, WHRI Noblesville IN	7435af 7315sa				1000	1100		USA, KTBN Salt Loke City UT USA, KWHR Noalehu HI	7510no 9930as	11565pa		
0900 1000	USA, WJCR Upton KY	7490va	13595as				1100		USA, Voice of America	5985pa	6165ca	7370co	9590ca
0900 1000	USA, WMLK Bethel PA	7555va	9475alt			1,000	1100		LICA MEMBER DI	11720as	15250as	15425as	
0900 1000 0900 1000	USA, WRMI Miami FL USA, WSH8 Cypress Crk SC	7385am 7535eu	9455sa			1000	1100		USA, WEWN Birminghom AL USA, WHRI Noblesville IN	5825na 6040na	7425na 9495sa	7465na	
0900 1000	USA, WTJC Newport NC	9370na				1000	1100		USA, WJCR Upton KY	7490va	13595as		
0900 1000	USA, WWCR Nashville TN Vanuatu, Radio	2390am 3945do	3210am 4960do	5070am 7260do	5935am	1000	1100		USA, WRMI Miami FL USA, WSHB Cypress Crk SC	9955am 6095am	9455sa		
0900 1000 vl 0900 1000	Zambia, Christian Voice	9865do	470000	720000		1000	1100		USA, WIJC Newport NC	9370na	743350		
0900 1000 vl	Zambia, National BC Corp	6165do	6265do			1000	1100		USA, WWCR Noshville TN	2390om	5070om	5935om	7435om
0900 1000 vl 0910 0930 s	Zimbabwe, Zimbabwe 8C Corp Armenia, Voice of	5975do 4810eu	6045do 15270eu			1000	1100	ul.	USA, WYFR Okeechobee FL Vanuatu, Radio	5950na 3945do	4960do	7260do	
0915 0930	Guam, Trans World Radio	15330gs	1027000			1000	1100	¥1	Zambia, Christian Voice	9865do	470000	720000	
0915 1000 vl	Ghano, Ghana BC Corp	6130do	4915da			1000	1100		Zambia, National BC Corp	6165do	6265do		
0915 1000 vl/as 0920 0950 s	Ghana, Ghana BC Corp Manaca, Trons World Rodio	4915do 9870eu	4915do			1000	1100	vl mtwhf	Zimbabwe, Zimbabwe BC Corp Ethiopia, Radio	5975do 5990do	6045do 7110do	9705do	
0930 1000 mtwhf	Guom, Trans World Radio	15330as				1030	1100		Malaysia, RTM Sarawak	7160do			
0930 1000 0930 1000	Italy, Adventist World Rodic Netherlands, Rodio	9660eu 7260va	9790va	12065va		1030	1100 1100		Mongolia, Voice of Sri Lanka, Sri Lanka BC Corp	12085ou 4940do	11835os	15120os	17850os
0930 1000	UK, BBC World Service	6195as	9740os	11760me	11955ро	1030	1100		UAE, Radia Dubai	13675eu	15370eu		21605eu
		15190sa 15565eu	15310as 15575as	15360os 17640eu	15400af 17760as								
	17790as	17830af	17885af		21660os								

FREQUENCIES ..

1100			Pakistan, Radio		21460eu			1100	1200		Sierra Leone, Sierra Leone 8S	5980da			
1100	1125		Netherlands, Radia	7260va	9790va	12065va		1100	1200		Singapare, R Singapore Intl	6150as	9600as		
1100	1127		Vietnam, Vaice of	7285as				1100	1200		Switzerland, Swiss R International	19540as	21770as		
1100	1130		Sri Lanka, Sri Lanka BC Corp	4940do	11835as	15210os	17850as	1100	1200		Taiwan, Voice of Asia	7445as			
1100	1130		Switzerland, Swiss R Internation		1 5000			1100	1200		Uganda, Radio	5026do	7110do	7196do	
1100	1130		UK, 8BC Caribbeon Report	6195ca	15220ca	15000		1100		smtwhf	UK, 8BC World Service	17885af			
1100	1200	O.S.	UK, BBC World Service	6195no 11775om	15190sa	15220am		1100	1200	S	UK, BBC World Service	6190af	11940of		
1100	1200	v	Anguilla, Caribbean Beacon Australia, ABC/Alice Springs	2310do				1100	1200	a s	UK, BBC World Service	5965na	6195va	9580as	9740as
1100	1200	v	Australia, ABC/Katherine	2485do								11760me			15220om
1100	1200	vl	Australia, ABC/Tennant Creek	2325do								15280as			15485eu
	1200	*1	Australia, Rodio	5995pa	6020vo	9580va	12080pa	1				15565eu		17640eu	1//UUas
			riositorio, Rodio	13605va	21820va	7,00044	12000pa	1100	1200		UK, Flat Earth Radio/Merlin	17830af			
1100	1200	νl	Botswona, Radio	7255do	9600do	7255do		1100	1200		UK, Virgin Radio/Merlin	21455me 21455me			
1100	1200	vl	Cameroon, RTV/Yaounde	4850do				1100	1200		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
1100	1200		Canada, CFRX Toronto ON	6070do							oor i, ruined Torees Radio	6350va	6458va	6847va	10320va
1100	1200		Canada, CFVP Calgary AB	6030do									12579va	12689va	13362va
1100	1200		Canada, CHNX Halifax, NS	6130do								16847vo		, 200, 10	1000210
1100	1200		Canada, CKZN St John's NF	6160do				1100	1200		USA, Armed Forces Radio	4278va	4319va	4993va	5765vo
	1200		Canada, CKZU Vancouver BC	6160do				1				6350va	6458va	6847va	10320va
1100	1200		Costa Rica, R for Peace Intl	15048va									12579va	12689va	13362va
1100	1200		Costa Rico, University Network		21815usb	01.00						16847va			
1100 1100	1200 1200	mtwhf	Ecuador, HCJB		15115va	21455usb		1100	1200		USA, KAIJ Dallas TX	5755vo			
1100	1200	os/vl	Eqt Guinea, Radio Africa Eqt. Guinea, Radio East Africa	15185of 15185of				1100	1200		USA, KTBN Salt Lake City UT	7510no	11545		
1100	1200	o/monthly	Finland, Scandy Weekend Radio		11720vo			1100	1200		USA, KWHR Noolehu HI	9930as	11565po	0/45	07/0
1100	1200	0, 11101111111	Germany, Deutsche Welle	6140eu	15410of	17800af	21780af	1100	1200		USA, Voice of America	5985pa	6110as 11720as	9645as	9760as
1100	1200		Germany, Voice of Hope	21590me	1311001	1700001	2170001	1100	1200		USA, WEWN Birmingham AL	11705os 5825no	7425na	15250as 15745na	1342305
1100	1200	v	Ghana, Ghana BC Corp	6130do	4915do			1100	1200		USA, WHRI Noblesville IN	6040na	9495sa	13/43/10	
1100	1200	vl/as	Ghona, Ghana BC Corp	4915do	4915do			1100	1200		USA, WJCR Upton KY	7490va	13595as		
1100	1200		Guyana, Voice of	5949do				1100	1200		USA, WRMI Miomi FL	9955am			
1100	1200		Iran, VOIRI		15385as	15585as	21470as	1100	1200		USA, WSH8 Cypress Crk SC	6095am	11660va		
1100	1000	1.4		21730as				1100	1200		USA, WTJC Newport NC	9370na			
1100	1200	vI/as	Italy, IRRS	7120vo	0.05			1100	1200		USA, WWCR Nashville TN	2390am	5070om	5935am	9475am
1100	1200		Japon, Rodio	6120na	9695as	15590as		1100	1200		USA, WYFR Okeechobee FL	5950na	11830na		
1100	1200		Jordan, Rodio Kenya, Kenya BC Corp	11690eu 4935do				1100		vl/s	Vanuatu, Radio	3945do	4960do	7260do	
1100	1200	vl	Lesotho, Rodio	4800do				1100	1200	νl	Zambia, Christian Voice	9865do	12/51		
1100	1200	νl	Liberio, ELWA	4760do				1100	1200	νI	Zambio, National BC Corp Zimbabwe, Zimbabwe BC Corp	6165do 5975do	6265do 6045do		
1100	1200	vl	Liberia, R Liberia International	6100do				1110	1120	**	Greece, Voice of	9420eu	15630eu		
1100	1200		Liberio, Voice of Hope	11530of				1115	1130	mtwhf	Vatican City, Vaticon Radio	5883eu	9645eu	11740eu	15595eu
1100	1200		Molaysia, Radio	7295do							20,7	21850eu	, 0 , 0 0 0		1007500
1100	1200		Molaysia, TRM Sarawak	7160do				1115	1145		Nepal, Radio	5005as	7165as		
1100	1200		Nomibia, Namibian BC Corp		7215af			1130	1135		Israel, Kol Israel	15640va	17545va		
1100 1100	1200		New Zealand, R New Zealand II					1130	1157		Czech Rep, Rodio Prague Intl	11640eu	21745as		
1100	1200	٧	New Zealand, ZDXA	3935do				1130	1200		Belgium, Radio Vlaanderen Intl	9865as			
1100	1200	۷I	Nigeria, Radio/Enugu Nigeria, Radio/Ibadan	6025do 6050do				1130	1200		Netherlands, Rodio	6045eu	9855eu		
1100	1200		Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	1130	1200 1200		South Karea, R Karea Intl	9650na			
1100	1200	νİ	Nigeria, Radio/Lagos	4990do	7285do	,2/300	757000	1130	1200	0	Sri Lanka, Sri Lanka BC Corp UK, Wales Radio Intl/Merlin	4940do 17625au			
1100	1200		Palau, KHBN/Voice of Hope	9955as	9965as	9985as	13840as	1130	1200	Ĭ	Vatican City, Vatican Radio	15595va	17515va		
1100	1200	v	Papua New Guinea, NBC	4890do	9675do				1200	v	Libya, Voice of Africa	11815af			
											,				

SELECTED PROGRAMS

JLL	CILD I NO	Olomb	• • •		• • • • • • • • • • • •		٠		
Daily 1100	BBCWS(om)	World Briefing (a daily 20 minute report on the latest news)		R. New Zenland Int	and business report for and about Asia and the Patific re- gion) Late Edition (National Radio's major late evening newscast)*	1149	5	R. Korea Int.	Korea and Its Splendors (a visit to a major historical, cultural or tourist attraction in Korea)
1100	R. Austrolia R. Japan R. New Zeoland Int.	RA News News RNZ News*	1110 1115	BBCWS(am) BBCWS(am)	Caribbean Sport (on 6195 and 15220 kHz. only) Caribbean Magazine (a current affairs and feature program facusing on life in the region)(on 6195 and 15220 kHz. only)	Fri 1125 1145		y R. Japan R. Koreg Int.	Music Beat (contemporary Japanese popular music) Notes of Nestalgia (traditional Korean music)
1120 1130	BBCWS(am) R. Korea Int.	News About Britain News		R. Jopan	Asian Top News (the day's major stories as reported by the region's radio stations)			rday	
Sund	day		1130	BBCWS(am)	World Business Report (a guide through the main business	1105	5	R. New Zealand Int.	Deep Purple (relaxing and thoughtful music with a touch of nostalaia)*
1105	R. Austrolia	Jazz Notes (recordings of Austrolian jazz artists and performances)		HCJB Ecuador	issues of the day) Morning in the Mountains (the longstanding breakfast pro-	1110	0	R. Jopon	Roundup Asia (interviews and reports highlighting
	R. New Zealand Int.	Sunday Supplement (listening to the opinions and at- titudes of New Zealanders)		R. Austrolia	gram from The Voice of the Andes with news, sports, prayer, friendly conversation and inspirational music) RA Sport (a daily report on sports events in Australia, Asia	1115	5	R. Australia	various aspects of the rapidly changing Asian region) Lingua Franco (Jill Kitson presents a program about language and its social, cultural and historical rami-
1110	R. Japan	Hello from Tokyo (listener letters, music and short fea- tures)			and the world)	1136	n	BBCWS(gm)	fications) World Business Review (Martin Webber explains the
1125	R. New Zeoland Int.	A Question of Religion (Maureen Garing talks with dif- ferent guests about religion and its aspects in the wid-	1145	BBCWS(am)	Sports Round-up (all the daily sporting news worldwide)	1130		BBC#3(UII)	consequences of recent business developments for companies, investors and consumers)
1130	RROWS(nm) Arts in Act	est sense, as well as answers listeners' questions)" ion (a weekly report on trends and developments in the	Tues 1125	K. Jopan	Let's Try Japanese (a Japanese language lesson for begin-	1140	0	R. Korea Int.	From Us to You (RKI answers listener mail and re- wards its contest winners)
1100	R. Austrolia	fine arts around the world) In Conversation (Helen Brown talks with the leaders	1145	R. Korea Int.	ners) Cultural Promenade (reports on contemporary and traditional	1149	5	BBCWS(am)	Sports Round-up (all the daily sporting news world-
		and characters of country Australia)			Korean arts and culture)				wide)
1140	R. Korea Int.	Multiwave Feedback (RKI's interactive program for DXers and SWLs)		nesday		(*Thi	is RNZ	l program airs one hou	r UT later from March 1B.)
Mon	day		1125	Untorgettable Musical	Masterpieces (a focus on Japanese pop songs writter in the post war years as a means of explaining Japanese history				
1125	R. Jopon	Musical Journey Around Japan (a tour of Japan's regions and their music)	1145	R. Korea Int.	and attitudes) Economic Radar (reports on Korean businesses and the Korean and Asian economies)				
Mon -	day-Friday BBCWS(om)	Caribbean Report (the latest news in the Caribbean)[on 6195 and 15220 kHz, only]	Thur	sday R. Joseph	Brush Up Your Japanese (on intermediate course in Japanese				
	R. Australia	Asia-Pacific (Radio Australia's flagship current events			nese)				

FREQUENCIES

1200 1200	1205 1215 1220		New Zealand, R New Zealand Ir Somalia, Radio Galkayo Kazakhstan, Radio Almaty	6985va 11840eu			15000	1200 1200 1200	1300 1300 1300	√	Nigeria, Radio/Kaduna Nigeria, Radio/Lagos Palau, KHBN/Voice of Hope	4770do 4990da 9955as 4890do	6090da 7285do 9965as 9675do	7275do 9985as	9570da 13840as
1200 1200 1200	1220 1227 1230	as	UK, BBC World Service Iran, VOIRI Philippines, FEBC		6195na 15385as	11940af 15585as	15220am 21470as	1200 1200 1200 1200	1300 1300 1300 1300	VI.	Oapua New Guinea, NBC Sierra Leone, Sierra Leone BS Singapore, R Singapore Intl Taiwan, R Taiwan International	5980do 6150as 7130as	9600as 9610au		
1200 1200 1200 1200	1230 1230 1245		Sri Lanka, Sri Lanka BC Corp Uzbekistan, Radio Tashkent USA, WYFR Okeechobee FL China China Radio Internationa	4940do 5060as 5950na	5975as 11830na 9730as	6025as 11970na 9760pa	9715as 11675pa	1200	1300 1300		Ugonda, Radio UK, BBC World Service	5026do 5965na 9740as 15220am	7110do 6195va 11760me 15280as	7196do 9515na 11955as 15310as	9580as 12095eu 15485eu
	1256		North Korea, R Pyongyang	11980as 3560va	15415as 9640va 13650va	9850va	9975va	1200	1300	a	UK, Flat Earth Raeio/Merlin		15575me 17885af 21515af	17640eu 21470af	17700as
1200 1200	1259 1300		Canada, R Canada Internationa Anguilla, Caribbean Beacon	16150as 11775am	11730as			1200 1200	1300 1300		UK, Virgin Radio/√erlin Ukraine, R Ukraine International	21455me	21515af	4993va	5765va
1200 1200 1200	1300 1300 1300	νl	Australia, ABC/Alice Springs Australia, ABC/Katherine Australia, ABC/Tennant Creek	2310do 2485do 2325do				1200	1300		USA, Armed Forces Radio	6350va 10940va	4319va 6458va 12579va	6847va	10320va 13362va
1200	1300	vl	Australia, Radio Botswana, Radio	5995pa 21820va 7255do	6020va 9600do	9580va 7255do	11650pa	1200	1300 1300		USA, KAIJ Dallas TX USA, KTBN Salt Lake City UT	16847va 5755va 7510na			
1200 1200 1200	1300 1300 1300		Brazil, Radio Nacional Bras Bulgaria, Radio Comeroon, RTV/Yaounde	15445am	17500eu			1200 1200	1300 1300		USA, KWHR Naalehu HI USA, Voice of America	9930as 6110as 11715as	11565pa 9645as 15250as	9760as 15425as	11705as
1200 1200 1200	1300 1300 1300	VI	Canada, CBC Northern Service Canada, CFRX Toronto ON Canada, CFVP Calgary AB					1200 1200 1200	1300 1300 1300		USA, WEWN Birmingham AL USA, WHRI Noblesville IN USA, W-CR Upton KY	5825na 6040na 7490va	7425na 9495sa 13595as	15745na	
1200 1200 1200	1300 1300 1300		Canada, CHNX Halifax, NS Canada, CKZN St John's NF Canada, CKZU Vancouver BC	6130do 6160do 6160do				1200 1200 1200	1300 1300 1300		USA, WRMI Miami FL USA, WSHB Cypress Crk SC USA, WTJC Newport NC	9955am 6095am 9370na	11660va		
1200 1200 1200	1300 1300 1300		Costa Rica, R for Peace Intl Costa Rica, University Network Ecuador, HCJB	15048va 15048irr	21815usb 21815usb 15115va	21455usb		1200 1200 1200	1300 1300 1300	vI/s	USA, WNCR Nashville TN Vanuatu, Radio Zambia, Christian Voice	5070am 3945do 9865do	5935am 4960do	7435am 7260do	15685am
1200 1200 1200	1300 1300 1300	as/v' a/monthly	Eqt Guinea, Radio East Africa Finland, Scandy Weekend Radio France, R France International	15185af 11690va	11720va 15155af		15540af	1200 1200 1204	1300 1300 1220	V	Zambia, National BC Corp Zimbabwe, Zimbabwe BC Corp UK, BBC Caribbean Report	6165do 5975do 6195ca	6265do 6045do 15220ca		
1200 1200	1300 1300		Germany, Deutsche Welle Germany, Voice of Hope	6140eu 15715me		1317341	1334001	1205 1215 1220	1300 1300 1240	occsnl	New Zealand, R New Zealand In Egypt, Radio Carro Kazakhstan, Radio Almaty		11840eu		
1200 1200 1200	1300 1300 1300		Ghana, Ghana BC Corp Guyana, Voice of Italy, IRRS	4915do 5949do 7120va	6130do			1220 1230	1300 1256		UK, BBC World Service Belgium, Radio V'aanderen Intl Vietnam, Voice of	6190af 9925eu 12019as	11940af		
1200 1200 1200	1300 1300 1300		Jordan, Radio Kenya, Kenya BC Corp Lesotho, Radio	11690eu 4935do 4800do				1230 1230 1230	1257 1300 1300	mtwhfa	Austria, R Austria International Bangladesh, Bangla Betar	6155eu 7184as	13730eu 9558as		
1200 1200 1200	1300 1300 1300		Liberia, R Liberia International Liberia, Voice of Hope	4760do 6100do 11530af				1230 1230 1230	1300 1300 1300		Germany, Overcomer Ministries Italy, Adventist World Radio Sri Lanka, Sri Lanka BC Corp	17820eu 4940do	6005as	6075as	9770as
1200 1200 1200	1300 1300 1300		Malaysia, Radio Namibia, Namibian BC Corp Netherlands, Radio	6045eu	7215af 9855eu			1230 1230 1240	1300 1300 1300	+	Sweden Radio Thailand, Radio Kazakhstan, Radio Almaty	15425as 18960na 9810as 9620eu	11840eu		
1200 1200 1200	1300 1300 1300		New Zealand, ZLXA Nigeria, Radio/Enugu Nigeria, Radio/Ibadan	3935do 6025do 6050do				1245	1300		Seycheles, FEBA Radio Taiwan, CBS	15535me 6180as 11775as	7250as	9630as	11725as

SELECTED PROGRAMS

1200	BBCWS(am) R. Australia	Newshour (an hour of news and analysis from around the globe) RA News
Sun	day R. Austral a	Country Club (Richard Porteous with an off-the-road
1203	N. PROSITOR O	would shough the union tools that make up that

Daily

stry Club (Richard Porteous with an off-the-road ramble through the various tracks that make up that

very wide field of country music) In Touch with Stockholm (an interactive listener contact 1230 R. Sweden program presented the first weekend of each month by Nidia Hagström)

Sounds Nordic (R. Sweden's youth music and trends nogazine, presented by Gaby Kctz every weekend of the month but the first.)

Monday

Late Night Live (Philip Adams Interviews the major 1205 R. Austrolio newsmakers, philosophers, artists and trendsetters in Australia and around the world) 1245 R. Sweden Sports Scan (a weekly report on sports in the Nordic

region)

Monday-Friday

1200 HCIB Ecuador 1205 BBCWS(cm)

HCIR Foundar RRCWS(rm)

HCIB Ecuador

Latin American and International News Caribbean Business (a report on regional commerce and economics) (on 6195 and 15220 kHz. only) Sports Report

Caribbean Report (the latest news in the Caribbean) (on 6195 and 15220 kHz. only] Morning in the Mountains (the longstanding breakfast program from The Voice of the Andes with news, sports, prayer, friendly conversation and inspirational music)

1230 HCIB Francer R. Sweden

Latin American and International Jours Sixty Degrees North (reports, interviews and analysis on the Nordic region)

Tuesday 1200 WWCR(15685kHz)

World of Radio (Glenn Houser's comprehensive review of the week in shortwave and international broadcasting)

1205 R Austrolic

1245 R Sunden

Late Night Live (Philip Adama interviews the major newsmokers, philosophers, artists and trendsetters in Austrolia and around the world)

Media Scan (the oldest program of its kind, George Wood now concentrates on satellite one cyberspace communications every first and third week)

Wednesday 1200 WWCR(15+85kHz)

1205 R. Austrolia

1245 R. Sweden

Communications World (Kirn Elliot reviews the week in alcbal communications) Late Night Live (Philip Adams interviews the major

newsmakers, philosophers, artist and trendsetters in Australia and around the world) Money Matters (a weekly economic report on the Nordic region)

Thursday 1205 R Austrolia

1245 R. Sweden

Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)

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 environFriday

1205 R. Austrolio

1245 R Sweden

Saturday 1205 R. Austrolio

1230 R. Sweden

Sweden Today (George Wood presents the voices of Sweden, the second week of the month) Spectrum (Bill Schiller covers the Swedish cultural

art, music, and sacred teats)

scene, the third week of the month) Studio 49 (conversations on ideas and long-term

mental awareness and challenges the second week of

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)

Sound Quality (Tim Ritchie seeks out the interesting,

the evolutionary, the inaccessible and the wonderful in

A Report on the Nordic Newsweek (the week's main news

The Spirit of Things (Dr. Rachael Kohn explores contem-

parary values and beliefs as expressed through ritual,

Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)

Heart Reat (Gaby Ketz hosts a monthly health and

the month)

music)

trends in Sweden and the Nordic region, the fourth week of the month) Dring with Cumbre (Marie Lamb with the hottest DX

cotches) World of Radio (Glenn Houser's comprehensive review of the week in shortwave and international broadcasting)

Frequencies

	1320 1325		Brazil, Radio Nacional Bras Netherlands, Radio	15445am 6045eu	9855eu			1300	1400	as	5 Africa, Channel Africa	11720af	17780af	21725af	
1300 1 1300 1 1300 1 1300 1	1330 1330 1330	\$	Egypt, Radia Cairo Germany, Universal Life Germay, Voice of Hape Guam, Adventist World Radio	17595as 9710eu 15715me 15225as	9955na			1300 1300 1300	1400 1400 1400		Sierra Leane, Sierra Leane BS Singapore, R Singapore Intl South Korea, R Korea Intl Sri Lanka, Sri Lanka BC Carp 15425as	5980do 6150as 9570as 4940do	9600as 13670 6005as	om 6075as	9770as
	330 356		Switzerland, Swiss R International China China Radio International 11980as	7405na	9570na	11675pa	11900pa	1300 1300	1400 1400		Uganda, Radio UK, BBC World Service 9515na	4976do 5965na 9590na	5026do 5995as 9740as	6190af	6195vo 11940af
1300 1	356 359 400		Romania, R Romania International Poland, Radio Polonia Anguilla, Caribbean Beacon	11940eu 6095eu 11775am	15290eu 7270eu	15335na 9525eu	17805na 11820eu				12095eu	15220am 15575me 21470af	15310as	15420af 17700as	15485eu
1300 1	400	vl vl vl	Australia, ABC/Alice Springs Australia, ABC/Katherine Australia, ABC/Tennant Creek	2310do 2485do 2325do				1300 1300 1300	1400 1400 1400	a a	UK, Flat Earth Radio/Merlin UK, Virgin Radio/Merlin USA, Armed Forces Radio		21455me 21515af 4319va	21515af 4993va	5765va
	400	νl	Australia, Radio 21820va Botswana, Radio	5995pa 7255do	6020va 9600do	9580va 7255do	11650pa	1300	1400		6350va	6458va 12689va	6847va 13362va	10320va 16847va	
1300 1 1300 1		vl	Cameroon, RTV/Yaounde	4850do	700000	723300		1300 1300 1300	1400 1400 1400		USA, KNLS Anchor Point AK USA, KTBN Salt Lake City UT	5755va 9615as 7510na	11545		
1300 1 1300 1	400 400 400		Canada, CFVP Calgary AB Canada, CHNX Halifax, NS Canada, CKZN St John's NF	6030do 6130do 6160do				1300	1400			9930as 6110as 15425as	11565pa 9645as	9760as	11705as
1300 1 1300 1	400 400 400		Canada, CKZU Vancouver BC Canada, R Canada Internationa Costa Rica, R for Peace Intl	6160do 19640na	13655na 21815usb	17710na		1300 1300 1300	1400 1400 1400		USA, WEWN Birmingham AL USA, WHRI Noblesville IN USA, WJCR Upton KY	6040na 7490va	15375na 15105na 13595as	15745na	
1300 l 1300 l	400 400	as/vl	Costa Rica, University Network Ecuador, HCJB Eqt. Guinea, Radio East Africa	15048irr	21815usb	21455usb		1300 1300 1300	1400 1400 1400		USA, WRMI Miami FL USA, WSHB Cypress Crk SC USA, WTJC Newport NC USA, WWCR Nashville TN	15725am 9430na 9370na	9455na	3.05	15.105
1300 1 1300 1		a/monthly	Finland, Scondy Weekend Radio Germany, Deutsche Welle Germany, Overcomer Ministries	11690va 6140eu	11720vo 13810af			1300 1300 1300	1400 1400 1400	mtwhf	USA, WWFV McCaysville GA USA, WWFV McCaysville GA USA, WWFV McCaysville GA USA, WYFR Okeechobee FL	5070am 12172va 9400va	5935am		15685am
1300 1	400	vl vl/as	Ghana, Ghana BC Corp Guyana, Voice of Italy, IRRS	4915do 5949do 7120va	6130do			1300	1400	vl	11970na Zambia, Christian Voice	9865do		11740na	1183Una
1300 1 1300 1	400 400	vl	Jordan, Radio Kenya, Kenya BC Corp Lesotho, Radio	11690eu 4935do 4800do				1300 1306	1400 1400 1357	vl occsnal	Zambia, National 8C Corp Zimbabwe, Zimbabwe BC Corp New Zealand, R New Zealand II Vietnam, Voice of	16095pa	6265do 6045do		
1300 1		vl vl	Liberia, ELWA	4760do 6100do 11530af				1330 1330 1330	1359 1400 1400	s	Finland, YLE/R Finland Austria, R Austria International Germany, Voice of Hope	7145eu 15400no 6155eu 15715me	13730eu		
1300 1	400 400 400		Malaysia, Radio	7295do	7215af			1330 1330 1330	1400 1400 1400		Guam, Adventist World Radio India, All India Radio Sweden, Radio	11755as 9690as		13710as 17870va	180/0
1300 1	400	vl vl vl	Nigeria, Radio/Enugu Nigeria, Radio/Kaduna	6025do 4770do 4990do	6090do 7285do	7275do	9570do	1330 1330 1330	1400 1400 1400		Turkey, Voice of UAE, Radio Dubai Uzbekistan, Radio Tashkent	17690as 13630eu	17815eu		21605eu 9715as
	400 400	vl	Palau, KHBN/Voice of Hope Papua New Guinea, NBC	9955as 4890do	9965as 9675do	9985as	13840as	1335	1350	f	Greece, Voice of Vatican City, Vatican Radio	12105eu 15235au	15650as	00230\$	7/1305

SELECTED PROGRAMS

)ti	TECTED LK	UGRAMS			• • • • • • • • • • • • •			
Dai 1300	BBCWS(am) China R. Int. R. Canada Int.	News News CBC News	1305 1310	BBCWS(am) R. Canada Int.	Outlook (topical magazine of people, places and events) This Morning (Shelagh Rogers hosts a lively mix of inter- views, documentaries, music, and personal essays deboting and discussing issues important to Canadians and showcas- ing Canado's finest writers, musicians, and ortists)	Frid		The S-Files (Kirs Baswell tokes you to the Sweden behind the headlines, the fourth week of the month)
Sun	day		1315	R. Australia	The Planet (Lucky Oceans, a/k/a Reuben Gosfield, presents	1330	China R. Int.	Life in China (a weekly magazine focusing on the lives of ordinary people in China)
1300	Channel Africa	Channel Africa Extra (a weekend magazine and variety show with news, sports, music, regular reports and features)			good, heartfelt, inspiring music from around the world with a rich mix of jazz, blues, folk styles, art music and mere in a show artfully arranged for radio)	1345	R. Sweden	A Report on the Nordic Newsweek (the week's main news stories)
1305	BBCWS(am)	Jazzmatazz (this program has had a long run in this time slot, but BBC On Air's listings appear to hint that	1330	R. Sweden YLE R. Finland	Sixty Degrees North (reports, interviews and analysis on the Nordic region) Finland This Morning (a breakfast program with news, a	Sat	urday Chonnel Africa	Channel Africa Extra (a weekend magazine and variety
	R. Australia	another program may appear here, at least temporarily) Country Club (continues from 1205)		The R. THINGING	business report, sports, weather and interviews focused on			show with news, sports, music, regular reports and fea- tures)
1310	R. Canada Int.	The Sunday Edition (the more reliased and reflective weekend edition of This Morning, hasted by Michael Enright)	1345	BBCWS(am)	Finland and the Mordic region) Off the Shelf (abridged serialized readings of novels, stories and other literature)	1305	BBCWS(am)	Global Business (Peter Day charts the transformations sweeping through the world of work and commerce)
1320	China R. Int.	In the Spotlight (Chinese arts and cultural magazine)	Turn	s all and			R. Austrolia	The Science Show (one of the longest running programs on ABC Radio)
1330	BBCWS(am) R. Sweden	In Praise of God (diverse services of worship) In Touch with Stockholm (on interactive listener contact	1330	Schay China R. Int.	Sports World (the sports scene in China and Asia)	1310	R. Canada Int.	The House (Jason Moscovitz presents a review of the
		program presented the first weekand of each morth 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.)	1345 Week	R. Sweden	Media Scan (the oldest program of its kind, George Wood now concentrates on satellite and cyberspace communica- tions every first and third week)	1330	BBCWS(am) R. Sweden	week in Conadian national politics) People and Politics (incide British politics) Weekand (a magazine about Europe from the Radio E consortium, on the first week of the month) Sweden Today (George Wood presents the voices
	YLE R. Finland	Capital Cafe (conversations with Finns from all walks of life)	1345	R. Sweden	Money Matters (a weekly economic report on the Noudic re- gion)			of Sweden, the second week of the month) Spectrum (Bill Schiller covers the Swedish culturel scene, the third week of the month)
	ıday		Thu	rsday				Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week
1330	China R. Int.	People in the Know (interviews with prominent Chinese who are shaping the nation's future)	1345	R. Sweden	Nordic Report (a monthly magazine on Scandinavia produced		WHR!(15105kHz.)	of the month) Diving with Cumbre (Marie Lamb with the hottest BX
1345	R. Sweden	Sports Scan (a weekly report on sports in the Nordic re- gion)			by the broadcasters of the Nordic region and broadcast the first week of the month) Greenscon (Azeriah Kiros highlights Swedish er viron-		YLE R. Finland	catches) Finland This Week (the best reports and interviews from the weekday program, Finland This Morning)
Mo 1 1300	nday-Friday R. Austrolia	RA News (a lifteen minute report with emphasis on sig- nificant events in Asia and the Pacific region)			mental 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)	1345	YLE R. Finland	Storting Finnish (a language lesson)

Shortwave Guide

1400 UTC

FREQUENCIES

1400 1400 1400	1405 1429 1430		Vatican City, Vatican Radio Czech Rep, Radio Prague Intl Thailand, Rodio	15235au 21745va 9530os	17515au			1400 1400 1400		۱۱ ۱۷ ۱۷	Nigeria, Radio/Enugu Nigeria, Radio/Ibadan Nigeria, Radio/Kaduna	6025do 6050do 4770do	6090do	7275do	9570do
1400 1400 1400 1400	1430 1430 1455 1456		Turkey, Vaice of USA, Vaice of America S Africa, Channel Africa China China Radio International		17815eu 17780af 7405na	21725af 9700as	1 11675as	1400 1400 1400 1400	1500 1500 1500 1500	٧l	Nigeria, Radio/Lagos Oman, Radio Sultanote of Palau, KHBN/Voice of Hope Sierra Legne, Sierra Legne BS	4990do 15140va 9955as 5980do	7285do 9965os	9985as	13840os
1400	1500	vl		13685af 11775am 2310do	15125af	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		1400	1500 1500		Singapore R Carp of Singapore Sri Lanka, Sri Lankii 8C Corp 15425as		6005as	6075as	9770as
1400 1400 1400	1500 1500	vl vl	Australia, ABC/Katherine Australia, ABC/Tennant Creek Australia, Radio	2485do 2325do 5995as	6080pa	9580as	11650pa	1400 1400 1400	1500 1500 1500		Switzerland, Swiss ₹ International Taiwan, ₹ Taiwan International Uganda, Radio	15125as 4976do	5026do		
1400 1400			Botswana, Radia Cameroon, RTV/Yaounde	7255do 4850do	9600do	7255do		1400	1500		UK, BBC World Service 9740as 15485eu	15565eu		17640eu	9590na 15310as 17700as
1400 1400	1500 1500 1500 1500		Canada, CBC Northern Service Canada, CFRX Taranto ON Canada, CFVP Calgary A8	6070do 6030do				1400 1400 1400	1500 1500 1500	0	17830af UK, Flat Earth Radio/Merlin UK, Virgin Radio/Merlin USA, Armed Farces Radio	17840am 15665na 21455me 4278va	21455me	21660af 21515af 4993va	5765va
1400 1400 1400 1400	1500 1500 1500		Canada, CHNX Halifax, NS Canada, CKZN St John's NF Canada, CKZU Voncouver 8C Canada, R Canada Internationa	6130do 6160do 6160do	13655na	17710na		1400	1500		6350vo	6458va	6847va 13362va		10940va
1400	1500 1500 1500		Costa Rica, R for Peace Intl Costa Rica, University Network Ecuador, HCJB	15048vo	21815usb 21815usb	21455usb		1400 1400 1400	1500 1500 1500		USA, KJES Vado NM USA, KTBN Salt Loke City UT USA, KWHR Naalehu HI	11715na 7510na 9930as	11565as		
1400 1400 1400	1500 1500 1500	as/vl a/monthly	Eqt. Guinea, Rodio East Africa Finland, Scandy Weekend Radio France, R France International	15185af 11690va	11720va	17680of			1500		USA, Vaice of America	6110as 15205as	7125as 15395as 15375na	9645as 15425os 15745na	9760os
1400 1400 1400	1500 1500 1500		Germany, Deutsche Welle Germany, Overcomer Ministries Germany, Voice of Hope	6140eu 6110eu 15715me	13810af			1400 1400 1400	1500 1500 1500		USA, WHRI Nablesville IN USA, WJCR Upton KY USA, WRMI Miami FL	6040na 7490va 15725am	15105na 13595as		
1400 1400 1400	1500 1500 1500		Ghana, Ghana BC Corp Guyana, Voice of India, All India Radio	5949do 9690as	6130do 11620os	13710as		1400 1400 1400	1500 1500 1500		USA, WTJC Newport NC USA, WWCR Nashville TN USA, WWFV McCaysville GA	9370na 9475am 12172am	12160am	13845am	15685om
1400 1400 1400	1500 1500 1500	vi/as	Italy, IRRS Japon, Radio Jordon, Radio	7120va 7200as 11690eu 4935da	9505as	9845as	1 (880va	1400 1400 1400 1400	1500 1500 1500 1500	mtwhf vl	USA, WWFV McCaysville GA USA, WYFR Okeechobee FL Zambia, Christian Voice Zambia, National BC Corp	9400vo 11550os 9865do 6165do	11740na 6265do	11830na	17760na
1400 1400 1400 1400	1500 1500 1500 1500	v}	Kenya, Kenya BC Carp Lesotha, Radia Liberia, ELWA Liberia, R Liberia International	4800do 4760do 6100do				1400 1415 1430	1500 1420 1500	VI	Zimbabwe, Zimbabwe 8C Corp Nepol, Radio Austria, R Austria International	5975do 5005as 6155eu	6045do 7165as 13730eu	17855au	
1400 1400	1500 1500 1500		Liberia, Vaice of Hope Malaysia, Radio Malaysia, RTM Sarawak Namibia, Namibian BC Corp	11530of 7295do 7160do	7215of			1430 1430 1430 1430	1500 1500 1500 1500		Guam, Adventist World Radio Guam, Trans World Radio Maloysia, RTM Ko-o Kinobalu Myanmor, Radio	15225as 15330as 5980do 5985do			
1400 1400 1400	1500 1500 1500	occsnol	New Zealand, R New Zealand In New Zealand, ZLXA		721301			1430	1500 1500		Netherlands, Radio Sweden, Radio	12070os 17505va	12090os 18960na	15595as	

SELECTED PROGRAMS

China R. Int. 1445 R. Sweden

Dally	1		
1400	BBCWS(om) China R. Int. R. Australia R. Canada Int. R. Japan R. Prague	D D D D	News News RA News GBC News News News
Sund	lay		
1400 1405	Channel Africa BBCWS(am)	Talking !	Africa Extra (continued from 1300) Point (where listeners and internet users can share wis on the issues of the day and put questions to uests)
	R. Austrolia	Books a	nd Writing (Ramona Koval conducts in-depth dis- focusing on books, ideas and writing)
	R. Canada Int.		day Edition (continues from 1310 with a feature
1410	R. Japan	Roundu	o Asia (interviews and reports highlighting various of the rapidly changing Asian region)
1420 1430	China R. Int. R. Sweden	In the Si In Touch gram pr Hagströi	pollight (Chinese arts and cultural magazine) with Stockholm (an interactive listener contact pro- esented the first weekend of each month by Nidia
88	da	month b	ut the first.)
Mon		Maraka	ideas (a saise that surless "his" adtual ideas)
1405 1430	BBCWS(am) BBCWS(am)	The Mus	1-ideas (a series that explores "big" cultural ideas) ic Mix (insights into current popular music) [ithru 28"- World-Tarry Russell looks back at blues' heritage

sours worner-lany racson books book at abuse memoge and plays the best of the new] People in the Know (interviews with prominent Chinese who are shaping the nation's future) Sports Scan (a weekly report on sports in the Mortlic region)

Mon	day-Friday	У	Frigi	7
1405	R. Australia	The Planet (continues from 1315)	1405	BBCWS(om)
	R. Conodo Int.	This Morning (continues from 1310)		
1415	R. Jopan	44 Minutes (current affairs magazine about Jopan and Asia)	1430	8BCWS(om)
1430	R, Sweden	Sixty Degrees North (reports, interviews and analysis on the Nordic region)		China R. Int.
		region)	1445	BBCWS(am)
Tues	day		1772	escus (om)
1405	BBCWS(am)	Meridian-Screen [thru 29th-On Screen-a weekly report on in-		R. Sweden
1703	oncu stani	ternational cinemal		
1430	Ching R. Int.	Sports World (the sports scene in Chine and Asia)		
1445	R. Sweden	Media Scan (the oldest program of its livind, George Wood now		rday
		concentrates on satellite and cyberspare communications every	1400	Channel Afri
		first and third week)	1405	BBCWS(om)
10/I				
	nesday	Note that the state of the stat		
1405 1430	BBCWS(am) BBCWS(am)	Music Review (classical music news and features) Westway (a radio soop opera)		R. Austrolio
1445	R. Sweden	Money Matters (a weekly economic regart on the Nordic region)		
1 113	n. 2000001	many manus to moved and manus referred and manus referred		R. Canada I
Thur	sday			
1405	BBCWS(om)	Meridian-Writing (reports on books, theatre, poetry, journalism,		
		biography, history and anthopology) [thru 10"-Writers on Lo-		R. Proque
		cation-Rosemary Hartill meets authors who identify strongly	1410	R. Jopon
1.420	BBGHE/)	with a particular part of Britain.]		
1430	BBCWS(om)	World of Music (the best of folk, non-Nestern classical and non- Western popular music)		
1445	R. Sweden	Nordic Report (a monthly magazine on Scandinavia produced		R. Progue
1113	n, sween	by the broadcasters of the Nordic region and broadcast the first	1430	R. Sweden
		week of the month)		
		Greenscon (Azeriah Kiros hignlights Swedish environ-		
		mental awareness and challenges the sacond 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 Baswell takes you to the Sweden be-		
		hind the headlines, the fourth week of the month)		
		man ma manaman ma manni arony as ma manni		

Monday-Friday

Frida	Fy	
1405	BBCWS(om)	Meridian-Masterpiece (critical examinations of creative endeavors)
1430	BBCWS(om)	Westway (a radio soap opera)
	China R. Int.	Life in China (a weekly magazine focusing on the lives of ordinary people in China)
1445	BBCWS(am)	Revolver (a guest musical artist gives a personal view on a selection of the best new releases from country to techno)
	R. Sweden	A Report on the Nordic Newsweek (the week's main news stories)
Satu	rday	
1400	Channel Africa	Channel Africa Extra (continued from 1300)
1405	BBCWS(om)	Sportsworld (live commentary on major sports events and features, soccer scores and results from around Britain and
		Europe, and news of all the the day's sporting action from around the world)
	R. Australia	New Dimensions (intimate conversations with many of this century's leading thinkers and social innovators)
	R. Canada Int.	Basic Black (Journalist, author, and humarist Arthur Black
		features people with unusual occupations, bizarre passions,
		and arcane obsessions, capped off with a quirky squint at

Life in China (a weeldy magazine focusing on the lives of ordinary people in China) Revolver (a guest musical artist gives a personal view on a selection of the best new releases from country to techna) A Report on the Nordic Newsweek (the weeld's main news stories)
Channel Africa Extra (continued from 1300) Sportsworld (live commentary on major sports events and flatures, soccer scores and results from around Britain and Europe, and news of all the the day's sporting action from
oround the world) New Dimensions (intimate conversations with many of this century's leading thinkers and social innevators) Basic Block (permanilat, author, and humonist Arthur Black features people with unusual occupations, bizarre passions, and arone obsessions, copped off with a quirtly squint at the week's events in a closing monologue) Readinas from Crech Literature
Weekend Square (a program designed to present various aspects of Jopan in a friendly and relaxed atmosphere with interviews, music and discussions)
Saturday Music (Czech classical, folk, jazz or rock music) Weekend (a magazine about Europe from the Radio E con- sortium, on the first week of the month)
Sweden Today (George Wood presents the voices of Sweden, the second week of the morth) 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)

Frequencies

1500															
1500	1530		Ecuador, HCJB	21455usb	2			1500	1600	vI.	Nigeria, Vaice of	7255af	15120af		
1500	1530		Germany, Voice of Hape		17550as			1500	1600	VI	Palau, KHBN/Voice of Hope	9955as	9965as	9985as	12040
1500	1530		Jordan, Radio	11690eu	1700003			1500	1600		Russia, Voice of Russia WS	7180na			13840as
1500	1530			9705am	11770om			1300	1000			/ 18Una	7315as	9800as	9875as
1500	1530		Mongalia, Vaice of	12015as	12085as			1500	1600		11500as	11.15 (
1500	1530		S Africa, Channel Africa	17770af	1200305			1500			S Africa, World Beacon	6145af			
1500	1556				7+05	0705	12/05 (1500	1600	O .	Seychelles, FEBA Radio	11600as			
1300	1550		China China Radio International	/ 10Uas	7405na	9785as	13685af	1500	1600		Sierra Leone, Sierra Leone BS	5980do			
1500	1556		15125af		153.			1500	1600		Singapore R Corp of Singapore				
1300	1330		North Karea, R Pyongyang	4405va	6574na	9335na	11710na	1500	1600		Sri Lanka, Srı Lanka BC Corp	4940do	6005as	6075as	9770as
1500	1550		13760na		10.00						15425as				
1500	1559		Canada, R Canada Internationa			17710na		1500	1600		Uganda, Radio	4976do	5026do		
1500	1600		Anguilla, Caribbeon Beacon	11775am				1500	1600		UK, BBC World Service	5975as	5995as	6190af	6195as
1500	1600		Australia, ABC/Alice Springs	2310do							9410eu	9515na	9590na	9740as	11860af
1500	1600		Australia, ABC/Katherine	2485do							11940af	12095eu	15220no	15310as	15400af
1500	1600	νI	Australia, ABC/Tennant Creek	2325do				1			15420af	15485eu	15565eu	17700as	17B30af
1500	1600		Australia, Radio	5995va	6080pa	9580as	11650pa				17840am	21470af	21490of	21660af	
			11660va					1500	1600	a	UK, Flat Earth Radio/Merlin	15665no	21455me	21515af	
1500	1600		Botswana, Radio	7255do	9600do	7255do		1500	1600	a	UK, Virgin Radio/Merlin	21455me			
1500	1600	v)	Cameroon, RTV/Yaaunde	4850do				1500	1600		USA, Armed Forces Radio	4278vo	4319va	4993va	5765va
1500	1600		Canada, CBC Northern Service	9625do							6350va	6458vo	6847va		10940va
1500	1600		Canada, CFRX Toronto ON	6070do								12689va	13362va	16847vo	1074010
1500	1600		Canodo, CFVP Calgary AB	6030do				1500	1600		USA, KAIJ Dallas TX	13815va	1000210	1004710	
1500	1600		Canada, CHNX Holifox, NS	6130do				1500	1600		USA, KJES Vodo NM	11715na			
1500	1600		Canada, CKZN St John's NF	6160do				1500	1600		USA, KTBN Salt Lake City UT	7510na			
1500	1600		Canoda, CKZU Vancouver BC	6160do				1500	1600		USA, KWHR Naolehu Hi	9930os	11565pa		
1500	1600		Costa Rica, R for Peace Intl	15048va	21815usb			1500	1600		USA, VOA Special English	6110as	9760as	9845as	12040as
1500	1600		Costa Rica, University Network	15048va	21815usb				, 000		15460as	011003	770005	704305	1204005
1500	1600		Ecuador, HCJB		15115va			1500	1600		USA, Voice of America	7125as	9575as	9645as	15205as
1500	1600	os/vl	Eqt. Guinea, Radio East Africa	15185af				1000	1000					704305	1320305
1500	1600	7 411													
1500		a/monthly			11720va			1500	1600		15395as				
1500	1600	a/monthly	Finland, Scandy Weekend Rodio	11690va	11720vo				1600		USA, WEWN Birminghom AL	11875vo	15375na	15745no	
1500	1600	a/monthly	Finland, Scandy Weekend Rodio Germany, Deutsche Welle	11690va 6140eu				1500	1600		15395as USA, WEWN Birminghom AL USA, WHRI Nablesville IN	11875vo 6040no	15375na 15105na		
1500			Finland, Scandv Weekend Rodio Germany, Deutsche Welle Germany, Overcomer Ministries	11690va 6140eu 6110eu	13810of			1500 1500	1600 1600		15395as USA, WEWN Birmingham AL USA, WHRI Nablesville IN USA, WJCR Upton KY	11875vo 6040no 7490vo	15375na		
	1600		Finland, Scandv Weekend Rodio Germany, Deutsche Welle Germany, Overcomer Ministries Ghana, Ghana BC Corp	11690va 6140eu 6110eu 4915do				1500 1500 1500	1600 1600 1600		15395as USA, WEWN Birminghom AL USA, WHRI Nablesville IN USA, WJCR Upton KY USA, WRMI Miami FL	11875vo 6040na 7490vo 15725am	15375na 15105na		
1500	1600 1600		Finland, Scandv Weekend Rodio Germany, Deutsche Welle Germany, Overcomer Ministries Ghana, Ghana BC Corp Guam, Trons World Radio	11690va 6140eu 6110eu 4915do 15330os	13810of			1500 1500 1500 1500	1600 1600 1600 1600		15395as USA, WEWN Birmingham AL USA, WHRI Noblesville IN USA, WJCR Upton KY USA, WRMI Miami FL USA, WTJC Newport NC	11875vo 6040no 7490vo 15725am 9370no	15375na 15105na 13595as	15745no	15405
1500 1500	1600 1600 1600		Finland, Scandv Weekend Rodio Germany, Deutsche Welle Germany, Overcomer Ministries Ghana, Ghana BC Corp Guam, Trons World Radio Guyana, Voice of	11690va 6140eu 6110eu 4915do 15330os 5949do	13810of			1500 1500 1500 1500 1500	1600 1600 1600 1600 1600		15395as USA, WEWN Birminghom AL USA, WHRI Nablesville IN USA, WJCR Upton KY USA, WRMI Miamr FL USA, WTJC Newport NC USA, WWCR Nashville TN	11875vo 6040no 7490vo 15725am 9370na 9475om	15375na 15105na	15745no	15685am
1500 1500 1500	1600 1600 1600 1600	vl	Finland, Scandv Weekend Rodio Germany, Deutsche Welle Germany, Overcomer Ministries Ghana, Ghana BC Corp Guam, Trans World Radio Guyana, Voice of Italy, IRRS	11690va 6140eu 6110eu 4915do 15330os 5949do 7120va	13810af 6130da	9845as		1500 1500 1500 1500 1500 1500	1600 1600 1600 1600 1600 1600	mtuhf	15395as USA, WEWN Birminghom AL USA, WHRI Nablesville IN USA, WJCR Upton KY USA, WRMI Miami FL USA, WTJC Newport NC USA, WWCR Nashville TN USA, WWFV McCoysville GA	11875vo 6040no 7490vo 15725am 9370no 9475om 12172am	15375na 15105na 13595as	15745no	15685am
1500 1500 1500 1500	1600 1600 1600 1600 1600	vl	Finland, Scandy Weekend Rodio Germany, Deutsche Welle Germany, Overcomer Ministries Ghana, Ghana BC Corp Guam, Trons World Radio Guyana, Yoice of Italy, IRRS Japan, Rodio	11690va 6140eu 6110eu 4915do 15330os 5949do 7120va 7200os	13810af 6130da	9845as		1500 1500 1500 1500 1500 1500 1500	1600 1600 1600 1600 1600 1600 1600	mtwhf	15395as USA, WEWN Birminghom AL USA, WHRI Noblesville IN USA, WJCR Upton KY USA, WJCR Upton KY USA, WTLC Newport NC USA, WWCR Noshville TN USA, WWFV McCoysville GA USA, WWFV McCoysville GA	11875va 6040na 7490va 15725am 9370na 9475am 12172am 9400va	15375na 15105na 13595as 12160am	15745no 13845am	15685am
1500 1500 1500 1500 1500	1600 1600 1600 1600 1600 1600 1600	vl vl/os	Finland, Scandv Weekend Rodio Germany, Deutsche Welle Germany, Overcamer Ministries Ghana, Ghana BC Corp Guam, Trons World Radio Guyana, Voice of Italy, IRRS Japon, Rodio Kenya, Kenya BC Corp	11690va 6140eu 6110eu 4915do 15330os 5949do 7120va 7200os 4935do	13810af 6130da	9845as		1500 1500 1500 1500 1500 1500 1500	1600 1600 1600 1600 1600 1600 1600 1600	mtwhf	15395as USA, WEWN Birminghom AL USA, WHRI Nablesville IN USA, WJCR Upton KY USA, WJCR Lepton KY USA, WTLO Newport NC USA, WWCR Nashville TN USA, WWFV McCoysville GA USA, WWFV McCoysville GA USA, WYFR Okeechobee FL	11875vo 6040no 7490vo 15725am 9370no 9475om 12172am 9400va 11830no	15375na 15105na 13595as	15745no	15685am
1500 1500 1500 1500 1500 1500	1600 1600 1600 1600 1600 1600 1600	vl vl/os	Finland, Scandv Weekend Rodio Germany, Deutsche Welle Germany, Overcomer Ministries Ghano, Ghano BC Corp Guam, Trons World Radio Guyana, Voice of Italy, IRRS Japon, Rodio Kenya, Kenya BC Carp Lesotho, Radio	11690va 6140eu 6110eu 4915do 15330os 5949do 7120va 7200os 4935do 4800do	13810af 6130da	9845as		1500 1500 1500 1500 1500 1500 1500 1500	1600 1600 1600 1600 1600 1600 1600 1600		15395as USA, WEWN Birminghom AL USA, WHRI Nablesville IN USA, WJCR Upton KY USA, WRMI Miomr FL USA, WTJC Newport NC USA, WWCR Nashville TN USA, WWFV McCoysville GA USA, WWFV McCoysville GA USA, WYFR Okeechobee FL Zambio, Christian Voice	11875vo 6040no 7490vo 15725am 9370no 9475om 12172am 9400va 11830no 4965da	15375na 15105na 13595as 12160am	15745no 13845am	15685am
1500 1500 1500 1500 1500 1500 1500	1600 1600 1600 1600 1600 1600 1600 1600	vl/os vl/os	Finland, Scandv Weekend Rodio Germany, Deutsche Welle Germany, Overcomer Ministries Ghano, Ghano BC Corp Guam, Trons World Radio Guyana, Voice of Itoly, IRRS Japon, Rodio Kenya, Kenya BC Corp Lesatho, Radio Liberia, ELWA	11690va 6140eu 6110eu 4915do 15330os 5949do 7120va 7200os 4935do 4800do 4760do	13810af 6130da	9845as		1500 1500 1500 1500 1500 1500 1500 1500	1600 1600 1600 1600 1600 1600 1600 1600	νl	15395as USA, WEWN Birminghom AL USA, WHRI Noblesville IN USA, WJCR Upton KY USA, WJCR Upton KY USA, WJCN Upton KY USA, WTLC Newport NC USA, WWCR Noshwille TN USA, WWFV McCoysville GA USA, WYFR Okechobee FL Zambia, Christian Vaice Zambia, National BC Corp	11875vo 6040na 7490vo 15725am 9370na 9475om 12172am 9400va 11830no 4965da 6165do	15375na 15105na 13595as 12160am 17750na 6265do	15745no 13845am	15685am
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1500 1500 1500 1500 1500 1500 1500 1500	1600 1600 1600 1600 1600 1600 1600 1600	vl/os vl/os	Finland, Scandv Weekend Rodio Germany, Deutsche Welle Germany, Overcomer Ministries Ghana, Ghana BC Corp Guam, Trans World Radio Guyana, Voice of Italy, IRRS Japan, Rodio Kenya, Kenya BC Corp Lesatho, Radio Liberia, ELWA Liberia, R Liberia International Liberia, Voice of Hope	11690va 6140eu 6110eu 4915do 15330os 5949do 7120va 7200os 4935do 4800do 4760do 6100do 11530af	13810af 6130da	9845as		1500 1500 1500 1500 1500 1500 1500 1500	1600 1600 1600 1600 1600 1600 1600 1600	vI vl	15395as USA, WEWN Birminghom AL USA, WHRI Nablesville IN USA, WJCR Upton KY USA, WJCR Upton KY USA, WTJC Newport NC USA, WWCR Noshville TN USA, WWFV McCoysville GA USA, WWFV McCoysville GA USA, WWFV McCoysville GA USA, WYFR Okeechobee FL Zambia, Christian Voice Zambia, National BC Corp Zimbabwe, Zimbabwe BC Corp Molowi, Molowi BC Corp	11875vo 6040ne 7490vo 15725am 9370na 9475om 12172am 9400va 11830no 4965da 6165do 5975do 3380do	15375na 15105na 13595as 12160am 17750na 6265da 6045da	15745no 13845am 17760na	15685am
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SELECTED PROGRAMS

Di	ally		Mon	day-Friday	/	1530	BBCWS(om)	Focus on Foith (Trevor Bornes looks at the religious stories
150	O BBCWS(am)	News	1505	R. Australia	Asia-Pacific (Radio Australia's flagship current events and busi-			behind the news)
	China R. Int.	News			ness report for and about Asia and the Pacific region)		R. Australia	The Media Report (Mick O'Regon takes a critical look at
	R. Austrolio	RA News		R. Canada Int.	This Morning (continues from 1310)			the latest developments in the communications industry)
	R. Conada Int.	CBC News	1511	Voice of Russia	News and Views (Russian views on news developments)			
	Voice of Russia	News			, , , , , , , , , , , , , , , , , , , ,	1545	R. Conada Int.	Out Front (a place for new ideas, new ways of making
153	D Voice of Russia	News in Brief	Tues	sday				radio and new voices from across Canada)
_			1505	BBCWS(am)	Discovery (in-depth exploration of ideas and discoveries in sci-			
	ınday				ence and technology)	Frid	ay	
150	5 BBCWS(am)	From Our Own Correspondent (the background to interna- tional events from BBC correspondents ground the world)	1530	BBCWS(em)	Essential Guide (the biggest developments, issues and names in global offairs) (thru 1 3th-Goadbye Village, Hello City-John	1505	BBCWS(am)	Sports International (the issues and personalities behind the headlines)
	R. Australia	Encounter (a highly acclaimed series exploring the con- nactions between religion and life while reflecting on the			Pictional investigates the implication of the global migration from countryside to town)	1530	BBCWS(am)	Pick of the World (Doire Brehan presents World Service highlights and talks with the producers and presenters of
	0.0 1.1.	religious experience of multicultural Australia)		China R, Int.	Sports World (the sports scene in China and Asia)		et e e e e	BBC programs)
1.50	R. Conada Int.	The Sunday Edition (continues from 1310)		R. Austrolia	The Law Report (Susanna Lobez presents breaking legal stories		China R. Int.	Life in China (a weekly magazine focusing on the lives of
152		In the Spotlight (Chinese arts and cultural magazine)			in Australia and overseas)		0.6 1.1.	ordinary people in China)
153	BBCWS(am) WHRI(6040 kHz.)	People and Politics (inside British politics) Diving with Cumbre (Marie Lamb with the hottest DX	1545	R. Canada Int.	Out Front (a place for new ideas, new ways of making radio		R. Conada Int.	C'est La Vie (Bernard StLaurent presents a program about
	WINK(OUTO KIZ.)	cotches)			and new voices from ocross Conada)	1532	Voice of Russia	life in Quebec and French-speaking Conada) Moscow Yesterday and Today (recolling the most interest-
153	2 Voice of Russia	Koleidoscope (the latest economic, social and cultural	307 a d	lm n n el n		1302	YORUS OF RUSSIG	ing events in the history of the city)
130	r rough of Messag	events in Russia and the (IS)		nesday				ing events at the instory of the city)
		events in resset that the CD/	1505	BBCWS(gm)	Health Matters (reports on research explaining where medicine	Cate	ırdav	
M	ondav				is going) [thru 13th/14th-20/20 Vision-Sue Armstrong asks	1505		Control
150		One Manual Interior where the section was a facility or	1700	0.4 - 0	what should modern healthcare priorities be?]	1000	8BCWS(am) R. Australia	Sportsworld (continues from 1405)
130	5 BBCWS(om)	One Planet (stories about the environment, development,	1530	R. Australia	The Religion Report (John Cleary examines the way religion		K. AUSTONO	Melisma (Robyn Johnston weaves together chamber mu-
153) BBCWS(am)	agriculture and human impact on the natural world) People and Places (a forum for the exchange of views and	1500	W	and societies interact)			sic, folk sources and jazz innovations in a graceful, me- ladic and sometimes challenging two hours)
130) pocha(aiii)	experiences on a global scale)	1532 1545	Voice of Russia	The Jazz Show (recordings from the Russian world of jazz)		R. Conada Int.	Basic Black (continues from 1405)
	China R. Int.	People in the Know (interviews with prominent Chinese	1343	R. Canada Int.	Out Front (a place for new ideas, new ways of making radio	1511	Voice of Russia	News and Views (Russian views on news developments)
	CHINIU N. HIII.	who are shaping the nation's future)			and new voices from across Canada)	1530	R. Australia	The Sports Factor (Amanda Smith presents reports which
	R. Austrolia	The Health Report (Dr. Norman Swan's weekly report on		and and		1330	N. PRESTITUTE	debate and celebrate the cultural significance of sport.)
	N. President	health and medical issues)		sday			WHRI(6040 kHz.)	Dxing with Combre (Marie Lamb with the hottest DX
153	Voice of Russia	Folk Box (music drawn from the traditions of the hundreds	1505	BBCWS(am)	Science View (the latest research put in a wider social		11111/00-10 1012-7	cosches)
. 50	10100 01 1100010	of nationalities that make up Russia and the (IS)			context) (Both of the programs Seeing Stars, about astronomy,	1532	Voice of Russia	Timelines (Estelle Winters' variety show giving insight into
154	R. Canada Int.	Out Front (a place for new ideas, new ways of making			and Soundbyte, about computers, will be broadcast during	1000		life in Moscow through foreign eves)
		radio and new voices from across (anada)			the first and last weeks of the month.)			us us uses used to see the see

Shortwave Guide

1600 UTC

FREQUENCIES

1600 1600 1600 1600	1610 1615 1625 1627 1627		Vaticon City, Voticon Radio Pokiston, Radio Netherlands, Radio Iran, VOIRI Vietnam, Voice of	11570va	13765au 15100va 12095as 9635as 9730eu	15235au 15725va 15595as 11775na	17720va	1600 1600 1600 1600 1600	1700 1700 1700 1700 1700	٧l	Nigeria, Radio/Ibodan Nigeria, Radio/Ibodan Nigeria, Radio/Kaduna Nigeria, Radio/Lagos Nigeria, Voice of	6025do 6050do 4770do 3326do 7255af	6090do 4990do 15120af	7275do	9570do
1600 1600 1600 1600	1630 1630 1630 1630	S	Ecuador, HCJB Germany, Universal Life Guam, Trans World Radio Mexico, R Mexico International	12005am 15105af 15330as	15115va	21455usb		1600 1600	1700 1700	**	Palau, KhBN/Voice of Hope Russia, Voice of Russio WS 7180os S Africa, World Beocon	9955os 4940me 7305os 6145af	9965as 4965me 9830me	13840as 4975me	6005me
1600 1600 1600 1600	1630 1630 1640 1645	νl	S Africo, Channel Africa Zimbabwe, Zimbabwe BC Corp UAE, Radio Duboi Germany, Deutsche Welle	9525af 5975do 13675eu 6170os	6045da 15395eu 7225as	21605eu 9735af	15380as	1600 1600 1600 1600	1700 1700 1700 1700		Sierra Leone, Sierra Leone BS South Koreo, R Korea Intl Sri Lanka, Sri Lanko BC Corp Uganda, Radio	5980do 5975om 4940do 4976do	9515va 5026do	9870va	
1600 1600 1600	1650 1656 1656	occsnol		17810as 16095po	21780af 13650af 6520va	9660va	9975va		1700		UK, BBC World Service 7160os 15210of	3915as 9410eu 15310as	5975os 9740eu 15420af	6190of 11940af 15565eu 21660af	6195os 12095eu 17700as
1600 1600 1600	1700 1700 1700		Algeria, R Algiers International Anguilla, Coribbean Beacon Australia, ABC/Alice Springs	11715vo 11775am 2310do		700040	777 3vu	1600 1600 1600	1700 1700	mtwhfa c	UK, BBC World Service UK, Flat Earth Radio/Merlin UK, World Beacon	9515na 15525eu 15455eu	15665no	21515af	57/5
1600 1600 1600	1700 1700 1700	٧l	Australia, ABC/Katherine Australia, ABC/Tennant Creek Australia, Rodio 11650pa		6080po	9580va	9655va	1600	1700		USA, KAII Dallas TX	4278va 6458va 12689vo 13815va	4319va 6847va 13362vo	4993va 10320va 16847vo	5765va 10940vo
1600 1600 1600 1600 1600	1700 1700 1700 1700 1700		Botswona, Rodio Comeroon, RTV/Yaaunde Canada, CBC Northern Service Canada, CFRX Toronto ON Canada, CFVP Calgary AB	3356do 4850do 9625do 6070do 6030do	4820do	7255do		1600 1600 1600 1600 1600	1700 1700 1700 1700 1700		USA, KJES Vado NM USA, KTBN Soll Lake City UT USA, KWHR Naalehu HI USA, VOA Special English USA, Voice of America	11715no 15590no 9930os 13600af 6035af	15445af 6110as	17895af 7125os	9575os
1600 1600 1600 1600	1700 1700 1700 1700		Canada, CHNX Halifax, NS Conada, CKZN St John's NF Conada, CKZU Voncouver BC Costa Rica, R for Peace Intl	6130do 6160do 6160do	21815usb				1700		9645os 15205as USA, WEWN Birminghom AL USA, WHRA Greenbush ME	9760as 15225af 11875na 17650af	11920of 15240af 13615na	12040af 15395as 15375no	13710af 15745na
1600 1600 1600 1600	1700 1700 1700 1700	a/monthly	Costa Rica, University Network Ethiopia, Radio Finland, Scandy Weekend Radio France, R France International	15048va 7165af 11690va	21815usb 9560af	12015af	15210of	1600 1600 1600 1600 1600	1700 1700 1700 1700 1700		USA, WHRI Noblesville IN USA, WINB Red Lion PA USA, WJCR Upton KY USA, WRMI Miami FL		15105no 13595as		
1600 1600 1600 1600	1700 1700 1700 1700		17850of Germany, Deutsche Welle Germany, Good News World R Germany, Overcomer Ministries Ghana, Ghana BC Corp		13810af 6130do			1600 1600 1600 1600	1700 1700 1700 1700	intwhf	USA, WS-IB Cypress Crk SC USA, WTIC Newport NC USA, WWCR Nashville TN USA, WWFV McCaysville GA USA, WWFV McCaysville GA	9370na 9475am 12172am 9400va		13845am	15685am
1600 1600 1600 1600	1700	vl/os	Guam, Adventist World Rodio Guyona, Voice of Italy, IRRS Jordan, Radio	11980as 5949do 7120va 17680no				1600 1600 1600	1700 1700 1700	۶۱	Zambia, Christian Voice Zombia, National BC Corp	11830na 21525af 4965do 6165do	6265do	17760na	18980eu
1600 1600 1600 1600	1700 1700 1700 1700 1700	vI	Kenyo, Kenya BC Corp Lesotho, Radio Liberia, ELWA Liberia, R Liberia International Liberia, Voice of Hope	4935do 4800do 4760do 6100do 11530af				1615 1630 1630 1630 1630	1630 1700 1700 1700	es :	UK, BBC World Service Egypt, Rodio Cairo Seychelles, FEBA Rodio Somalia, Rodio Galkoya UK, Merlin Network One	11860af 15255af 11605as 6985va 12065as	21490af		
1600 1600 1600	1700 1700 1700 1700	vl	Malawi, Molowi BC Corp Malaysio, Rodio Namibia, Nomibion BC Corp New Zealand, ZLXA	3380do 7295do	7215of			1630 1645 1650	1700 1700	vl	Zimbabwe, Zimbabwe BC Corp Bangladesh, Bangla Betar New Zealand, R New Zealand I	4828do 7184eu	6045do 7462eu	9550eu	15520eu

SELECTED PROGRAMS

Dail 1600 1630	R. Australia R. Austria Int,	RA News Report from Austria (a daily magazine focusing on Aus- tria and central and eastern Europe)
Sun	day	
1600	BBCWS(om) WHRI(15105 kHz.)	News Summory Doing with Cumbre (Marie Lamb with the hottest DX contries)
1601	BBCWS(am)	International Recital (a 16th series of chamber con- certs from St. George's, Bristol, in the southwest of En- gland with fifteen young musicians from eight cour- tries performing music from some of the world's great musical traditions)
1605	R. Austrolia	The National Interest (Terry Lane's round-up of the week's major issues)
1635	R. Austria Int.	Radio E (a weekly magazine on Europe jointly pro- duced by the BBC and other European broadcasters)
	nday	
1630	BBCWS(am)	Analysis (background to the stories in the news)

Monday-Friday

1600 BBCWS(cm) World Briefing (a daily 20 minute report on the latest news)
1645 BBCWS(cm) Sparts Roundup (all the daily sparting news worldwide)

Tuesday

1605 R. Austrolia

The Comfort Zone (Alan Sounders presents a unique program that debates and celebrates the cultural significance of architecture and design, landscape and cordens, and food?

1630 BBCWS(om)

Wednesday 1605 R. Australia

1630 BBCWS(om)

R. Austrolia

Thursday 1605 R. Austrolia

1630 BBCWS(am)

Friday 1605 R. Austrolia

1630 BBCWS(am)

Saturday

1600 BBCWS(em) 1605 BBCWS(em) R. Australia 1645 R. Austria Int. Analysis (background to the stories in the news)

Verbotim (a program that charts the story of the 20th century through the vicins of ordinary austribians). From Our Own Correspondent (the cockground to international events from BBC correspondents around the world). Earshot (a half-hour feature from 1 a footpaths, paddocks, lounge rooms and shopping malts of the diverse Australian continent).

Hindsight (a documentary programather looks at Australian social history through the broad there's of institutions, popular culture, health and the environment)

Analysis (background to the stories in the news)

Awaye! (Produced and presented by Aboriginal broadcasters, this is Australia's only national indigenous arts and culture program)

Analysis (background to the stories in the news)

News Sportsworld (continues from 1405): Malisma (continues from 1505) Malisma (Murray Hall and Berharry Bell read listeners' letters and respond to their questions'.

Continued from page 48

0532 \voice of Russia Audio Book Club (readings from the best of Russian classic and contemporary literature)

Saturday

Satu	ruay	
0500	EBCWS(om)	The World Today (the BBC's agenda-setting flagship glo- bal news program)
	F. Netherlands	A Good Life (how development affects societies)
	Voice of Nigeria	African Safari (exploring the roots of African musical styles)
	MBCO	Amos 'n Andy (the classic radio comedy from America's post)
0505	P. Austrolia	Pacific Focus-Sport (the week's sports news as reported on the daily magazine Pacific Beat)
	R. New Zealand Int.	Focus on Politics (a report on government and politics in NZ)*
0510	R. Japan	Hello from Takyo (listener letters, music and short features)
0511	Voice of Russia	Science and Engineering (reports on the latest developments in science and technology)
0530	Beutsche Welle	German by Radio (a language lesson)
	R. Austrolio	Educational series (details not yet available at deadline)
	R. New Zeoland Int.	In a Mellow Tone (Hayden Shirley plays relaxing and nos- talaic music)*
0532	Voice of Russia	Timelines (Estelle Winters' variety show giving insight into life in Mascow through foreign eyes)
0535	Spanish Foreign R.	Radio Club (answering listeners' letters)
0545	Spanish Foreign R.	Radio Waves (a weekly program for radio enthusiasts)

("This RNZI program airs one hour UT later from March 18.)

1700

12:00 PM EST 11:00 AM CST 9:00 AM PST

Shortwave Guide

1:00 PM EST 12:00 PM CST 10:00 AM PST

FRENLIENCIES

FREQUENCIE	S									
1700 1727 1700 1727 1700 1730 1700 1730 1700 1730 1700 1730 1700 1730 0 1700 1730 mtwhf	Czech Rep., Radia Prague Intl Vietnam, Voice af France, R. France International Germany, Overcamer Ministries Jardon, Radio S. Africo, Channel Africa UK, Flot Earth Radio/Merlin UK, Merlin Network One Chino Chuno Radio International	5930eu 17485af 12070eu 11615af 15210af 6110eu 17870af 15525eu 15665na 12065as 7150af 9570af	21515af 9670af 9	1800 1800 1800 1800 1800	1827 1827 1830 1830 1830	Czech Rep, Radio Prague Intl Vietnam, Vaice of Egypt, Radio Caira S Africa, Adventist World Radio S Africa, Channel Africa UK, BBC World Service 9410eu 15575me	5930eu 7440eu 15255of 5960af 17870of 3255af 9510as 17830af	7315va 9730eu 6100af 5975as 9740pa 17840na	6190af 15400af 21470af	6195eu 15420of
1700 1756 1700 1800 1700 1800 vl 1700 1800 vl 1700 1800 vl 1700 1800 vl	9795af Romania, R. Romania Internationa Anguilla, Coribbean Beacon Austrolia, ABC/Alice Springs Austrolia, ABC/Alterine Austrolia, ABC/Tennant Creek Australia, Radia	11910af 19625eu 11740eu 11775am 2310da 2485da 2325da 5995va 6080pa 11880ya	11940eu 1	1800 1800 1800 1800 1800 1800 1800 1800	1830 1859 1859 1900 1900 of the first state of the	UK, RTE Radia Canada, R Canada International Paland, Radio Palania Anguilla, Caribbean Beacon Argentina, RAE Australia, ABC/Alice Springs Australia, ABC/Katherine Australia, ABC/Tennant Creek	9895me 11720af 5995eu 11775am 15345eu 2310da 2485da 2325da	13640of 7285eu		
1700 1800 1700 1800	Bangladesh, Bangla Betar Botswana, Radio Cameroon, RTV/Yaaunde Canado, CBC Narthern Service Canada, CFRX Toronto ON Canado, CFRX Toronto ON Canado, CFRX Toronto ON Canado, CFRX St John's NF Canado, CKZN St John's NF Canado, CKZN St John's NF Canado, CKZU Vancauver BC Costo Rica, R for Peace Intl Costo Rica, R for Peace Intl Costo Rica, University Netwark Egypt, Radio Carro Egt Guinea, Radio Africa Inland, Scandv Weekend Radio Germany, Deutsche Welle Germany, Deutsche Welle Germany, United Methadist Churi Ghana Ghana RC Carr	7184eu 7462eu 3356da 4850da 9625da 6070da 6030da 6160da 6160da 15048va 21815usb 15255af 11590va 6140eu 11795me 9495me 13810af 15485af 3366da 4915da 9420eu	9550eu 1. 7255do	15520eu 1800 1800 1800 1800 1800 1800 1800 1800	1900 vl 1900 vl 1900 vl 1900 1900 1900 1900 1900 1900 mtwh! 1900 0/monthly 1900 1900 vl	Australia, Radio 9815as Botswana, Radia Cameroan, RTVYYaaunde Canada, CERX Taronta ON Canada, CERX Taronta ON Canada, CERX Taronta ON Canada, CERX Taronta ON Canada, CKIN St John's NF Canada, CKIN St John's NF Canada, CKZIV Ancouver BC Casta Rica, R for Peace Intil Casto Rica, University Network Eqi Guinea, Radia Afrac Finland, Scanda Weekend Radia Germany, Deutsche Welle Germany, Uni Methadist Church Germany, Voice of Hape Ghana, Ghana BC Cara	23230s 6080s 31880vo 3356do 4850do 4850do 6030do 6130do 6160do 15048va 15048va 15048va 15048va 13810at 4475vo 3366do	7240po 4820do 21815usb 21815usb 11720vo 15485cf 11735cf 4915do	9580va	9655va
1700 1800 1700 1800	Greece, Vaice of Guyana, Vaice of Israel, Kol Israel Japan, Radio Kenyo, Kenyo & Corp Lesotho, Radio Liberia, ELWA Liberia, R Liberia International Liberia, Voice of Hope Malawi, Malawi & Corp Moloysia, Radia Namibia, Namibian BC Corp New Zealand, R New Zealand, Israel Mey Zealand, ZiXA Nigeria, Radio/Enugu Nigeria, Radio/Ibadan Nigeria, Radio/Kaduna Nigeria, Radio/Kaduna Nigeria, Radio/Kaduna Nigeria, Radio/Kaduna Nigeria, Radio/Kaduna Nigeria, Radio/Kaduna Nigeria, Radio/Kaduna Nigeria, Radio/Kaduna Nigeria, Radio/Kaduna Nigeria, Radio/Kaduna Nigeria, Vaire of Russia WS.	5949do 11605va 17545va 9505na 11970eu 4835do 4800do 4760do 6100do 11530of 3380do 7295do 3270of 15120po 3935do 6025da 6050do 4770da 4770da 3326do 6050do 4770da 9955os 9965os 7180me 9830me	15355af 7275do 9: 13840os	1800 1800 1800 1800 1800 1800 1800 1800	1900 vl 1900 vl 1900 vl 1900 vl 1900 vl 1900 vl 1900 vl 1900 vl 1900 vl 1900 vl 1900 vl 1900 vl 1900 vl 1900 vl 1900 vl	Guyana, Voice of India, All India Radio 13790af Italy, IRRS Kenya, Kenya BC Carp Kuwait, Radio Lesotho, Radio Liberia, ELWA Liberia, R Liberia International Libera, Vicice of Hape Molawi, Molawi BC Carp Molaysia, Radio Namibia, Namibian BC Corp Netherlands, Radio New Zeoland, R New Zeoland Int New Zeoland, R New Zeoland Int New Zeoland, R New Zeoland Int New Zeoland, R New Zeoland Nigeria, Radio/Ibaddan	7410s 15200af 3985va 4935do 11990vo 4800do 4760do 5100do 11530of 3380do 7295do 3270af 6020of 15120pa 3935do 6025do 6050do	9950os 17670of 3289of 11655of	11620as	11935os
1700 1800 1700 1800 1700 1800 rreg 1700 1800 vl 1700 1800 1700 1800	Russia, Voice of Russia WŠ S Africa, World Beacon Sierra Leone, Sierra Leone BS Sri Lanka, SR. Lanka BC. Corp Sudan, Radio Omdurman Uganda, Radio UR, BBC World Service 6190af 9630af	6145of 5980do 4940do 7199do 9200do 4976do 5026do 3255af 3915as 6195eu 7160as 9740os 15400af	9410eu 95	1800 1800 1800 1800 1800 1800 1800 1800	1900 vI 1900 vI 1900 1900 1900 os 1900	Nigeria, Radio/Kaduna Nigeria, Radio/Lagos Palau, KHBN/Vaice of Hope Philippines, Radyo Pilipinas Russia, Vaice of Russia WS Russia, Vaice of Russia WS 11510af	4770do 3326do 9965as 11720me 5940eu 7340eu	6090da 4990da 13840as 15190me 6045eu 9775eu	7275do 17720me 7180eu 9830af	9570do 9890eu
1700 1800 1700 1800 1700 1800 1700 1800	UK, World Beacon USA, Armed Forces Radio 6350va 12579va USA, KAIJ Dallos TX USA, KTBN Salt Lake City UT	17840na 21470af 15455eu 4278va 4319va 6458va 6847va 12689va 13362va 13815va 15590na	4993vo 5	1800 1800 1800 1800 1800 1800 1800 1800	1900 m 1900 1900 1900 irreg 1900 1900	S Africa, Amateur Radio League S Africa, Warld Beacon Sierra Leane, Sierra Leane BS Sri Lanka, Sri Lanka BC Corp Swaziland, Trans Warld Radio Taiwan, R Taiwan International Uganda, Radio	3215of 3230of 5980do 4940do 3200of 3955eu 4976do	11640af 9500af 5026da		
1700 1800 1700 1800 1700 1800 mtwhf 1700 1800	USA, KWHR Noolehu HI USA, Vaice of America 9760as 15395os USA, Voice of America 9795as USA, WEWN Birmingham AL	9930os 6040of 6110os 11920of 12040of 15455of 17895of 5990os 6045os 11955os 12005os	15205as 15 9525as 96 15255as	2645os 1800 5240of 1800 2670os 1800	1900 mtwhf 1900 1900	UK, Merlin Network One UK, World Beacon USA, Armed Forces Radio 6350va 12579va USA, KAU Dallas TX	6130af 15585af 4278va 6458va 12689va 13815va	12065os 17665of 4319vo 6847vo 13362vo	4993va 10320va 16847va	5765va 10940va
1700 1800 1700 1800 1700 1800 1700 1800 1700 1800 1700 1800 1700 1800 1700 1800 1700 1800	USA, WHRA Greenbush ME USA, WHRI Noblesville IN USA, WINB Red Lion PA USA, WCR Upton KY USA, WKLK Bethel PA USA, WRMI Miomi FL USA, WRMI Miomi FL USA, WSHB Cypress Crk SC	11875na 13615na 17650af 13760sa 15105na 13570eu 13595as 15265eu 15725am 18910af 9370na 12160am		5745na 1800 1800 1800 1800 1800 1800 1800 1800	1900 1900 1900 1900 1900 1900 1900 1900	USA, KTBN Solt Loke City UT USA, Voice of America USA, Voice of America USA, WEWN Birmingham AL USA, WHRA Greenbush ME USA, WHRI Noblesville IN USA, WINB Red Lian PA USA, WINB Red Lian PA USA, WICR Upton KY	15590na 9930as 6035af 11975af 11875na 17650af 9495sa 13570eu 7490va	6040af 13710af 13615na 13760na	9565os 15240af 15375no	9760as 15580af 15745na
1700 1800 1700 1800 mtwhf 1700 1800 1700 1800 1700 1800 vl 1700 1800 vl 1715 1730	USA, WWCR Nashville TN USA, WWFV McCaysville GA USA, WWFV McCaysville GA USA, WYFR Okeechabee FL Zombia, Christian Voice Zombia, National BC Corp Zimbabwe, Zimbabwe BC Corp Voltican City, Voltican Radio 15959eu Armenia, Trans World Radio	12172am 9400vo 18980eu 21455eu 4965do 6165do 6265do 4828do 6045da 4005eu 5883eu		1800 1800 1800 1800 1800 1800 1800 1800	1900 1900 1900 1900 1900 1900 1900 mtwhf	USA, WMLK Bethel PA USA, WRMI Miami FL USA, WSHB Cypress Crk SC USA, WTJC Newport NC USA, WWCR Noshville TN USA, WWFV McCoysville GA USA, WWFV McCoysville GA USA, WWFV McCopselle GA USA, WWFV McCopselle GA USA, WFR Okeechobee FL	15265eu 15725am 15665eu 9370na 9475am 12172am 9400va 18980eu	18910of 12160om	13845am	15685am
1725 1740 1725 1740 1730 1745 1730 1745 vl 1730 1745 1730 1745 1730 1745 mtwhf	Germany, Trans World Radio Monaco, Trans World Radio Ascension Is, United Notions Radio Libya, Voice of Africa S Africa, United Notions Radio Swaziland, Trans World Radio Swaziland, Trans World Radio UK, United Nations Radio Guam, Adventist World Radio	11815of 17725af 6125of 9500af 3200af 15495va		1800 1800 1800 1800 1830 1830 1830	1900 1900 vl 1900 vl 1900 vl 1900 1900	Yemen, Rep of Yemen Radio Zombia, Christian Voice Zombia, National BC Corp Zimbobwe, Zimbobwe BC Corp Ascension Is, RTE Radio Belgum, Radio Vloanderen Intl Canado, RTE Radio Mongolia, Voice of	9780da 4965da 6165da 4828da 21630af 5910eu 13725na 12085as	6265do 6045do 9925eu	13770me	
1730 1800 1730 1800 1730 1800 1730 1800 1730 1800 1730 1800 1730 1800 1730 1800 mlwhf 1730 1800 1735 1745 vl/th 1745 1800	Guam, Adventist World Rodio Netherlands, Radio Philippines, Rodyo Philipinas S Africa, Adventist World Rodio Slovakia, R. Stovakia International Switzerland, Swiss R. International UK, BBC, World Service UK, Merlin Network One Vatican City, Vatican Radio Paraguay, Rodio Nacional India, All India Rodio Swaziland, Trans Warld Rodio	7455os 11560me 6020di 11655of 11720me 12130of 5915eu 6055eu 9605of 13790of 7385os 9780os 12065os 15560os 13765of 9739so 7410eu 9950os 15200of 17670of 3200of 9500of	17720me 7345eu 15555af 11660as 17515af 11620eu 11	1830 1830 1830 1830 1845	1900 1900 mtwhhfa 1900 s 1900 as	Netherlands, Radio Sweden, Radio Sweden, Radio UK, BBC World Service 9410eu 15575me USA, Voice of America Congo, RTV Congolaise	9895af 6065va 9765va 3255af 930af 17830af 13675af 5985da	13700af 6005af 9740pa 17840na 15455af	17605af 6190af 15400af 21470af 17895as	6195eu 15420af
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1900 UTC

2:00 PM EST 1:00 PM CST 11:00 AM PST

Shortwave Guide

3:00 PM EST 2:00 PM CST 12:00 PM PST 2000 UTC

FREQUENCIES

FREQUENCIES							• •						
1900 1915 1900 1927 1900 1930 1900 1930 1900 1945	Canga, RTV Cangalaise Vietnam, Vaice of Iran, VOIRI Philippines, Radya Pilipinas Germany, Deutsche Welle 15390al India, All India Radia	7255me 11720me 11765of 17810of 7410as	9730eu 7750me 15190me 11810af	17720po 13610af 11620as	15135of 11935as	2000 2000 2000 2000 2000 2000 2000 200	2015 2025 2027 2030 2030 2030 2030		Swaziland, Trans World Radio Netherlands, Radio Iran, VOIR! Hungary, Radio Budapest Isroel, Koll Isroel Mangolio, Vaice af Switzerland, Swiss R International 13790af	3200af 6020af 6110eu 6025eu 6280va 12015eu 6165af	11655af 7215eu 7135eu 9435va 12085eu 9605af	13700af 7255eu 15640va 11910af	17605af 9022eu 15650va 13660af
1900 1950 1900 1956 1900 2000 1900 2000 vl	13790af New Zealand, R New Zealand Int China China Radio International Anguilla, Caribbean Beacan Australia, ABC/Katherine Australia, ABC/Tennant Creek	15120pa 6165at 11775am 2485da 2325da	17670of 9440of	95B5af	0500	2000 2000 2000 2000 2000 2000	2030 2030 2030 2045 2045		Turkey, Vaice of USA, Vaice of America 9690as 15240af Vatican City, Vatican Radio Germany, Deutsche Welle Iraq, Radio Iraq International Chino Chino Radio International	6140as 4950af 9760as 15580af 9660af 9725eu 9684va	7240as 6035af 11855af 17725af 11625af	6095as 11975af 17885af 13765af	7415of 13710of
1900 2000 1900 2000 vl 1900 2000 vl 1900 2000	Australia, Radia 9815as Botswana, Radio Cameroon, RTV/Yaounde Canada, CFRX Toronto ON	11880va	7240pa 4820do	9500as	9580va	2000 2000 2000 2000 2000 2000	2056 2100 2100	vl	Algeria, R Algiers International	5965eu 11715eu 11775om 2310do	9440of 15160eu	9840eu	11735af
1900 2000 1900 2000 1900 2000 1900 2000 1900 2000 1900 2000	Canada, CFVP Calgary AB Canada, CHNX Halifax, NS Canada, CKZN 51 John's NF Canada, CKZU Vancauver BC Canada. CBC Northern Service Casta Rica, R far Peace Intl	6030do 6130do 6160do 6160do 9625do 15048va	21815usb			2000 2000 2000 2000 2000 2000 2000	2100 2100 2100 2100 2100 2100 2100 2100	os vi	Australia, ABC/Alice Springs Australia, ABC/Kahlerine Australia, ABC/Tennant Creek Australia, Radio 12080pa Australia, Radio 12080pa Botswana, Radio Bulgaria, Radio	2485do 2325do 9500as 6080as 3356do 7200eu	9580va 7240pa 4820da 7500eu	9815os	11880vo
1900 2000 1900 2000 1900 2000 mtwhf 1900 2000 a/monthly 1900 2000	Casto Rica, University Network Ecuadar, HCJB Egt Gunea, Radia Africa Finland, Scandv Weekend Radio Germany, Overcomer Ministries Germany, Voice of Hope Ghana, Ghana BC Corp	17660eu 15185af 11690va 17870na 7290eu	21815usb 11720va			2000 2000 2000 2000 2000 2000	2100 2100 2100 2100 2100 2100 2100 2100	۷I	Comeroon, RTV/Yaounde Conado, CBC Northern Service Conado, CFR Taronto ON Conado, CFR Taronto ON Conado, CFNX Holilar, NS Conado, CKIN St John's NF Conado, CKZN ST John's NF Conador, HCIB Fat Guina Rodin Africa	4850do 9625do 6070do 6030do 6130do 6160do 6160do			
1900 2000 vl 1900 2000 s 1900 2000 vl 1900 2000	Ghana, Ghana BC Corp Greece, Voice of Italy, IRRS Kenya, Kenya BC Corp Kuwait, Radio		4915do 17565so	17705na		2000 2000 2000 2000 2000 2000 2000 200	2100 2100 2100 2100 2100 2100	mtwhf a/monthly	Costa Rica, R for Peace Intl Costa Rica, University Network Ecuador, HCJB Eat Guinea, Radio Africa Finland, Scandy Weekend Radio	15048va 15048va 17660eu 15185af 11690va	21815vo 15065vo 11720vo	21815usb	
1900 2000 vl 1900 2000 vl 1900 2000 vl 1900 2000 vl 1900 2000 vl 1900 2000 vl 1900 2000 vl	Lesotho, Radio Liberia, ELWA Liberia, R. Liberia International Liberia, Vaice of Hope Malawi, Malawi BC Corp Malaysia, Radio Nambio, Namibian BC Corp	4800do 4760do 5100do 11530of 3380do 7295do	3289af			2000 2000 2000 2000 2000 2000 2000 200	2100 2100 2100 2100 2100 2100 2100 2100	vl vl	Germany, Voice of Hape Ghana, Ghana BC Corp Indonesia, Voice of Italy, IRRS Kenya, Kenya BC Corp Kuwait, Radia Lesotho, Radio	7290me 3366da 9525va 3985va 4935do 11990va 4800do	11735of 4915do 11785vo	15149va	
1900 2000 1900 2000 1900 2000 vl 1900 2000 vl 1900 2000 vl	Netherlands, Radia New Zealand, ZLXA Nigena, Radio/Enugu Nigena, Radio/Ibadan Nigena, Radio/Kaduna Nigena, Radio/Lagos	3935do 6025do 6050do 4770do	11655of 6090do	13700of 7275do	17605af 9570do	2000 2000 2000 2000 2000 2000 2000	2100 2100 2100 2100 2100	vl vl mtwhfa namibia, Ne	Libera, ELWA Libera, ELBera International Malawi, Molawi BC Corp Malaysia, Radio Molta, Voice of Mediterranean omibian BC Corp New Zeoland, R New Zeoland Int New Zeoland, R New Zeoland Int New Zeoland, ZIXA Nigeria, Radio/Ibadan Nigeria, Radio/Ibadan Nigeria, Radio/Ibadan Nigeria, Radio/Ibadan Nigeria, Radio/Ibadan Nigeria, Radio/Ibadan Nigeria, Radio/Ibadan Nigeria, Radio/Ibadan	5100do 3380do 7295do 7440eu 3270of 17675po	3289of		
1900 2000 vl 1900 2000 vl 1900 2000	North Korea, R Pyongyang 13760na	7255af 4405va	4990do 15120af 6574no	9335na	11710no	2000 2000 2000 2000	2100 2100 2100 2100 2100 2100	v v v	New Zealand, ZLXA Nigeria, Radio/Enugu Nigeria, Radio/Ibadan Nigeria, Radio/Kaduna	3935do 6025do 6050do 4770do	7290do 6090do	7275do	9570do
1900 2000 1900 2000 1900 2000 1900 2000	Russia, Voice of Russia WS 7340eu Russia, World Beacon S Africa, World Beocon Sierra Leone, Sierra Leane 85	9775eu 7360eu	5950eu 9875af 11640af	6045eu 9890eu	7205eu 11510af	2000 2000 2000 2000	2100 2100 2100 2100	A A A	Nigeria, Radia/Lagos Nigeria, Voice of Papua New Guinea, NBC Russia, Voice of Russia WS	3326do 7255af 4890do 5940eu 9775eu	4990da 15120af 5950eu 9890eu	6045eu	7340eu
1900 2000 vl 1900 2000 1900 2000 irreg 1900 2000 a 1900 2000	Salamon Islands, SIBC South Korea, R Korea Intl Sri Lanka, Sri Lanko BC Corp Sri Lanka, Sri Lanko BC Corp Swaziland, Trans World Radio Thailand, Radio	5020do 5975om 4940do 6010eu 3200af 9535eu	7275eu			2000 2000 2000 2000 2000 2000 2000	2100 2100 2100 2100 2100 2100 2100 2100	vl mtwhf irreg vl	Russia, World Beacon S Africa, World Beacon Sierra Leone, Sierra Leone BS Solamon Islands, SIBC Spain, R Exterior Espana Sri Lanka, Sri Lanka BC Carp Syria, Radio Damascus	7360eu 3230af 3316do 5020do 9595af 4940do 12085eu	11640af 9680eu 13610eu		
1900 2000 1900 2000	Uganda, Radia UK, BBC World Service 9410eu 17830af UK, BBC World Service	3255af	5026do 6005af 9740pa	6190of 15400of	6195of 15575os	2000 2000 2000 2000	2100 2100 2100 2100		Uganda, Radio UR, BBC World Service	4976da 3255af 6195eu 11835af 9675af	5026do 5975po 9410eu 15400of	6005of 963 0 af 17830af	6190af 9740pa
1900 2000 hf 1900 2000 1900 2000	UK, Merlin Network One UK, World Beacon USA, Armed Forces Radio 6350va 12579va	6130af 9675eu 4278va 6458va 12689va	15585eu 4319va 6847va 13362va	4993va 10320va 16847va	5765va 10940va	2000 2000 2000 2000	2100 2100 2100 2100 2100		USA, Armed Forces Radio USA, KAIJ Dallas TX USA, KJES Vado NM USA, KJES Vado NM USA, KJEN Salt Loke City UT USA, KWHR Naalehu HI	4278va 6350vo 10940vo 16847va 13815va 15385au 15590na 17510as	4319va 6458va 12579va	4993va 6847va 12689va	5765va 10320va 13362va
1900 2000 1900 2000 1900 2000 1900 2000 1900 2000 1900 2000	USA, KALI Dallas TX USA, KJES Vado NM USA, KTBN Salt Lake City UT USA, KWHR Naalehu HI USA, VOA Special English USA, Voice of America	4950af	12015me 6035af 11870pa	13640me 7415of 11920of	9525pa 11975af	2000 2000 2000 2000 2000 2000 2000 200	2100 2100 2100 2100 2100 2100		USA, WEWN Birminghom AL USA, WHRA Greenbush ME USA, WHRI Noblesville IN USA, WINB Red Lion PA USA, WJCR Upton KY USA, WMLK Bethel PA	11875na 17650af 5745sa 13570eu 7490va 15265eu	13615na 9495sa 13595as	15375na 13760na	15745na
1900 2000 1900 2000 1900 2000 1900 2000	USA, WEWN Birmingham AL USA, WHRA Greenbush ME USA, WHRI Noblesville IN USA, WINB Red Lion PA	17650of	13615na 13760na	15375na	15745na	2000 2000 2000 2000 2000	2100 2100 2100 2100 2100 2100	mtwhf	USA, WRMI Miomi FL USA, WTJC Newport NC USA, WWCR Noshville TN USA, WWFV McCoysville GA USA, WWFV McCoysville GA USA, WYFR Okeechobee FL	15725om 9370na 9475am 12172am 9400va	12160am	13845am	15685am
1900 2000 1900 2000 1900 2000 1900 2000	USA, WJCR Upton KY USA, WMLK Bethel PA USA, WRMI Miami FL USA, WSHB Cypress Crk SC	7490va 15265eu 15725am 15665eu	13595as 18910af			2000 2000 2000 2000 2000	2100 2100 2100 2100 2100	vl vl vl	USA, WYFK Okeechobee FL Vanuatu, Radia Zambia, Christian Voice Zambia, National BC Corp Zimbabwe, Zimbabwe BC Corp	7355eu 3945do 4965do 6165do 4828do 11550eu	15565eu 4960do 6265do 6045do	7260do	
1900 2000 1900 2000 1900 2000 1900 2000 mtwhf 1900 2000	USA, WTJC Newport NC USA, WWCR Noshville TN USA, WWFV McCaysville GA USA, WWFV McCaysville GA USA, WYFR Okeechobee FL Zambia, Christian Voice	12172am 9400va 18980eu 4965da	12160am	13845am	15685am	2000 2025 2030 2030 2030 2030 2030	2045 2045 2045 2045 2057 2100	vl t h	USA, WYFK Okeckhobee FL Vanuatu, Radia Zambia, National BC Corp Zimbabwe, Zimbabwe BC Corp USA, WSHB Cypress Crk SC Italy, RAI International Libyo, Voice of Africa Thailand, Radia Vietnam, Voice of Belarus, R Belarus International Cuba, Radia Havana	7220at 11815af 9535eu 7145eu 7105eu	15665of 9710of 17725of 9730eu 7210os 13750eu	11880af	
1900 2000 vl 1900 2000 vl 1915 1925 1930 1955	Zambia, National BC Corp Zimbabwe, Zimbabwe BC Carp Rwanda, Radia Greece, Voice of Austria, R Austria International	4828do 6055do 7475eu	6265do 6045do 9375eu 6155eu			2030 2030 2030 2030 2030	2100 2100 2100 2100 2100 2100		Egypt, Radio Cairo Germany, Adventist World Radia Poland, Radio Polonia S Africa, Adventist World Radio Sweden, Radio	13660eu 15375af 9615af 6030eu 9745af	7185eu 9445vo	7265eu	9540eu
1930 2000 1930 2000 1930 2000 vl 1930 2000 1930 2000	Austria, K Austria International Iran, VOIRI Papua New Guinea, NBC Slovakia, R Slovakia International Switzerland, Swiss R International	6110eu 4890do 5915eu	7215eu 6055eu 11910af	7255eu 7345eu 13660af	9022eu	2030 2030 2030	2100	Os	USA, Vaice of America USA, Voice of America	6065va 6035af 9760as 15580af 4950af	6095as 11975af 17725af	7415af 13710af 17885af	9690as 15240af
1930 2000 1930 2000 1935 1955 1945 2000 1950 2000	Turkey, Voice of Italy, RAI International Albanio, R Tirana International New Zealand, R New Zealand Int	6140as 5975eu	7240os 7285eu 9510eu	9760eu		2030 2040 2040 2045 2050 2050	2100 2050 2100 2100 2100 2100		Uzbekiston, Rodio Tashkent Volican City, Vatican Radio Armenia, Voice of Indio, All India Radio Vatican City, Vatican Radio Vatican City, Vatican Radio	7105eu 9645eu 4810eu 7150au 9950eu 4005eu 9645eu	9540eu 9965eu 7410eu 11620au 5883eu	9650eu 11715au 7250eu	9910au
						. 2000	2.00	***					

2100 UTC

4:00 PM EST 3:00 PM CST 1:00 PM PST

Shortwave Guide

5:00 PM EST 4:00 PM CST 2:00 PM PST 22**00** UTC

FREQUENCIES .

	LUUL	-IACIE2	• • • • • • • • •				
2100 2100 2100	2110 2110 2127		Kenya, Kenya BC Corp Vatican City, Vatican Radia Czech Rep., Radio Prague Intl	4935do 4005eu 5930va	5BB3eu 9430va	7250eu	
2100 2100 2100 2100	2129 2130 2130 2130	vl vl vl	Poland, Radia Polonia Australia, ABC/Alice Springs Australia, ABC/Katherine Australia, ABC/Tennant Creek	6030eu 2310do 2485do 2325do	7185eu	7265eu	9540eu
2100	2130		Australia, Radio 11880va	7240pa 12080pa	9500as 17715va	9580va 21740va	9660pa
2100 2100 2100	2130 2130 2130	sa	China China Radio International Cuba, Radio Havana UK, BBC World Service	5965eu 13660eu 5975ca	9840eu 13750eu	11735af	13640af
2100 2100 2100	2145 2156 2156		Germany, Deutsche Welle 15410va North Korea, R Pyongyang Romania, R Romania International	9615af 17560va 6574va 5955eu	9690af 17835af 9335va 7195eu	9765va 7215eu	15135va 9690eu
2100	2159		Canada, R Canada International 13650eu	5995eu	7235eu	9770eu	9805eu
2100 2100 2100	2200 2200 2200	vl	Angola, R Nacional de Angola Anguilla, Caribbean Beacan Botswana, Radio	3374va 11775am 3356do	4950va 4820da	7245va	
2100 2100 2100 2100 2100 2100 2100 2100	2200 2200 2200 2200 2200 2200 2200 220	vl	Cameroon, RTV/Yoounde Canada, CBC Northern Service Canada, CFRX Toronto ON Canada, CFVP Colgary AB Canada, CHNX Halifax, NS Canada, CKZN St John's NF Canada, CKZN St John's NF Canada, CKZU Vancouver BC Costa Rica, R for Peace Intl	4850do 9625do 6070do 6030do 6130da 6160da 6160da 15048va	21815va		
2100 2100 2100	2200 2200 2200		Casta Rica, University Network Ecuador, HCJB Egypt, Radio Cairo	15048va 17660eu 15375af	15065va	21815usb	
2100 2100	2200 2200	mtwhf f/monthly	Eqt Guineo, Rodio Africa	15185of Finland Sc	andv Weeker	nd Radio	11690va
2100	2200	vl	Ghana, Ghana BC Carp	3366da	4915do	io kaala	1107040
2100 2100	2200 2200	۷l	India, All India Radia 9950eu Italy, IRRS	7150au 11620au 3985va	7410eu 11715ou	9650eu	9910au
2100	2200	٧l	Japan, Radia 17825na Lesotho, Radio	6115eu 21670pa 4800do	6180eu	11830eu	11855of
2100 2100 2100	2200 2200 2200	vl vl	Liberia, ELWA Liberia, R Liberia International Malawi, Malawi BC Corp	4760do 5100do			
2100 2100	2200 2200	*1	Malaysia, Radio Namibia, Namibian BC Carp	3380da 7295da 3270af	32B9af		
2100 2100 2100	2200 2200 2200	vl	New Zealand, R New Zealand Int New Zealand, ZLXA Nigeria, Radio/Enugu	17675pa 3935do 6025do			
2100 2100 2100	2200 2200 2200	vl vl	Nigeria, Radio/Ibadan Nigeria, Radio/Kaduna Nigeria, Radio/Lagos	6050do 4770do	6090do	7275do	9570do
2100 2100	2200 2200	vl	Palau, KHBN/Voice of Hope Papua New Guinea, NBC	3326do 99B5os 4B90da	4990do		
2100	2200		Russia, Voice of Russia WS 7340eu Russia, World Beacon	5940eu 9890eu 7360eu	5950eu	6045eu	7300eu
2100 2100 2100	2200 2200 2200	vl	S Africa, Warld Beacon Sierra Leone, Sierra Leane BS Solomon Islands, SIBC	3230of 3316do 5020do	11640of 9545do		
2100 2100 2100	2200 2200	irreg	South Korea, R Korea Intl Sri Lanka, Sri Lanka BC Corp	15575eu 4940do			
2100	2200 2200	vl	Syria, Radia Damascus UK, BBC World Service 6005af	120B5eu 3255af 6110as	13610eu 3915as 6190af	5965as 6195va	5975pa 9410eu
2100 2100	2200 2200		9740pa UK, Warld Beacan USA, Armed Forces Radio	11B35af 9675af 4278va	12095sa 4319va	15400of	
2100	2200		6350va 12579vo USA, KAIJ Dallas TX	6458va 12689va 13815va	6847va 13362va	4993va 10320va 16847vo	5765va 10940va
2100 2100 2100	2200 2200 2200		USA, KWHR Noalehu HI	15590na 17510as 6035af	6040me	6095as	7415of
2100	2200		9595os 13710af	9670as 15185pa 17820as 7415no	9760me 15240of	11870pa 15580af	11975of 17725of
2100 2100 2100	2200 2200 2200			9975na 17650of			15375na
2100 2100	2200 2200 2200		USA, WINB Red Lion PA USA, WJCR Upton KY	5745na 13570eu 7490va	9495sa 13595as	13760na	
2100 2100 2100	2200 2200 2200		USA, WRMI Miami FL	15265eu 15725am 11550eu	15665af		
2100 2100 2100	2200 2200			9370na 7435am	9475am	12160am	13845am
2100 2100	2200 2200 2200	mtwhf	USA, WWFV McCaysville GA USA, WYFR Okeechobee FL	12172va 9320va 7355eu	15565af	21525af	
2100 2100 2100	2200 2200	vl vl	Vanuatu, Radio Zambia, Christian Voice	3945do 4965do	4960do	7260da	
2100 2115 2115	2200 2130	vi mtwhf	Zimbabwe, Zimbabwe 8C Corp UK, BBC Caribbean Report	4828da 5975co	6265do 6045do 11675co	15390ca	
2120 2130	2200 2200 200	s f	Greece, Voice of	6010eu	15650au		
2130 2130 2130	2156 2200	tf vl	UK, BBC Calling Falklands China, China Radia International Australia, ABC/Alice Springs	11680sa 5965eu 4835do	9840eu		
2130 2130 2130	2200 2200 2200	*!	Australia, ABC/Katherine Australia, ABC/Tennant Creek Australia, Radio	302300	9660pa	11880va	12080po
				, -			

2130 2200 2130 2200 2130 2200 2130 2200 2130 2200 2130 2200	th	17715va Belarus, R Belarus International Guom, Adventst World Radia Iran, VOIRI Turkey, Voice of Uzbekiston, Radio Tashkent	21740va 7105eu 11960as 9780va 9525eu 9540eu	7210as 11980as 11740va		
		2200				
2200 2210 2200 2210 2200 2220 2200 2225 2200 2227 2200 2230 2200 2230 2200 2230	vl vl s	Malawi, Malawi BC Carp Zambia, Natianal BC Carp Greece, Voice of Italy, RAI International Iron, VOIRI Hungary, Radio Budapest Hungary, Rodio Budapest Indio, All India Radia	3380da 6165da 9420au 9675as 9780va 6025eu 6025eu 7150ou	6265da 15650au 11900as 11740va	15240as 9650eu	9910au
2200 2230 2200 2230 2200 2230 2200 2230 2200 2230	vl mtwhf	9950eu Mexico, R. Mexico International Papua New Guinea, NBC South Karea, R. Korea Intl Turkey, Voice of USA, Voice of America	11620au 9705am 4890da 3975eu 9525as 6035af	11715au 11770am 7415af	11655af	11975af
2200 2245 2200 2245 2200 2256 2200 2259 2200 2300 2200 2300 2200 2300	vl vl	Egypt, Radio Cairo USA, WYFR Okeechobee FL China China Radio International Canada, R. Canada International Anguilla, Caribbean Beacon Australia, ABC/Alice Springs Australia, ABC/Kotherine	9990eu 7580eu 7170eu 11705as 6090am 4835da 5025da	11740na	15565af	21525af
2200 2300 2200 2300	vI vI	Australa, ABC/Tennant Creek Australa, Radio Bulgana, Radio Cameroon, RTV/Yaaunde Canado, CBC Northern Service Canado, CFRX Taronto ON Canado, CFRX Taronto ON Canado, CFRV Calgary AB Canado, CHNX Halifax, NS Canado, CKZN Si Jahn's NF Canado, CKZN Si Jahn's NF Canado, CKZU Vancouver BC	4910do 11715va 7200eu 4850do 9625do 6070do 6030do 6130da 6160do 6160do	17795va 7500eu	21740va	
2200 2300 2200 2300 2200 2300 2200 2300	mtwhf f/monthly	Costa Rica, R for Peace Intl Costa Rica, University Network Eqt Guinea, Radia Africa	15048va 15048va 15185of Finland, Sc	15065va 15065va candv Weeke	21815usb 21815usb	11690va
2200 2300 2200 2300 2200 2300 2200 2300 2200 2300 2200 2300 2200 2300 2200 2300 2200 2300 2200 2300	vl vl vl	11720va Ghana, Ghana BC Corp Italy, IRRS Liberna, R Liberna International Molloysoa, Radia Normibia, Normibian BC Corp New Zealand, R New Zealand Int New Zealand, ZUXA Nigerna, Radia/Fangu Nigerna, Radia/Ibadan	3366do 39B5va 5100do 7295do 3270of 17675pa 3935do 6025do	4915do 32B9af		
2200 2300 2200 2300 2200 2300 2200 2300 2200 2300 2200 2300 2200 2300 2200 2300 2200 2300	vl vl vl os irreg	Nigeria, Rodio/Kaduna Nigeria, Rodio/Kaduna Nigeria, Rodio/Kagos Palau, KHBN/Orice of Hope Sierro Leone, Sierro Leone BS Solomon Islands, SBC Spain, R Exterior Espano Sri Lonka, Sri Lonka BC Corp Taiwan, R Taiwan International	6050do 4770do 3326do 9955os 3316do 5020do 9595of 4940do 5810eu	6090do 4990do 9965as 9545do 9680eu 9355eu	7275do 99B5os	9570do
2200 2300 2200 2300 2200 2300 2200 2300	fa	UK, BBC World Service 7105as 12080po UK, Global Kitchen/Merlin Ukroine, R Ukroine International USA, Armed Forces Radio	5965as 9590na 12095sa 3955eu 5905va 4278va 6458va	5975na 9660as 15400af 6170eu 9560va 4319va	6175na 11B35af 7165eu 11770va 4993va	6195vo 11955as 5765va
2200 2300 2200 2300 2200 2300 2200 2300 2200 2300		6350va 12579va USA, KAIJ Dallos TX USA, KTBN Solt Lake City UT USA, KWHR Naalehu HI USA, Voice af America	12689va 13815vo 15590na 17510as	6847va 13362va	10320va 16847va 9890as	10940va
2200 2300 2200 2300 2200 2300 2200 2300 2200 2300		15185os	7215as 15290as 7415na 9975na 17650af	9770as 15305pa 13615na	17735pa 15375na	11760as 17820as
2200 2300 2200 2300 2200 2300 2200 2300		USA, WENN Birminghom AL USA, WHRA Greenbush ME USA, WHRA Greenbush ME USA, WHRI Noblesville IN USA, WINB Red Lion PA USA, WICR Upton KY USA, WICR Upton KY USA, WRMB Cypress Crk SC	5745na 13570eu 7490va 15725am 7510eu	9495sa 13595as 15285sa	13760na	
2200 2300 2200 2300 2200 2300 2200 2300	mtwhf	USA, WTJC Newport NC USA, WWCR Nashville TN USA, WWFV McCaysville GA USA, WWFV McCaysville, GA	9370na 5070am 6890va 9320va	7435am	9475am	13845am
2200 2300 2200 2300 2230 2257 2230 2300	νl	Vanuatu, Radia Zambia, Christian Voice Czech Rep, Radio Prague Intl Albania, R Tirana International	3945do 4965do 7345na 7130eu	4960do 9435af 9540eu	7260do	
2230 2300 2230 2300 2230 2300 2230 2300 2230 2300	mtwhf vI/as vI/a	Austrolio, Christian Voice Austrio, R. Austrio International Belgium, Rodio Vlaanderen Intl Cuba, Radio Havano Hungary, Rodio Budapest Solomon Islands, SIBC Solomon Islands, SIBC	13780va 5945eu 13660am 9550am 3975eu 5020do 9545do	15165va 6155eu	17645va 13730af	21680va
2230 2300 2245 2300 2245 2300 2245 2300		Sweden, Radio India, All India Radio USA, WYFR Okeechobee FL Vatican City, Vatican Radio	6065vo 9705os 11740na 7305as	7235va 9950as 9600as	11620os 11830os	13605as

Shortwave Guide

FREQUENCIES

2300 2300 2300 2300 2300	0000 0000 0000 0000 0000	vl vl	Anguilla, Caribbean Beacon Austrolia, ABC/Alice Springs Austrolia, ABC/Katherine Austrolia, ABC/Tennant Creek Austrolia, Christian Volce	6090am 4835do 5025do 4910do 13780va	15165va	17645va	21680va	2300 2300 2300 2300 2300 2300	0000 0000 0000 0000		USA, WBCQ Montice to ME USA, WEV®N Birminghom AL USA, WHRA Greenbush ME USA, WHRI Noblesville IN USA, WIN3 Red Lion PA	7415na 7425na 17650na 5745na 13570am	9385no 9495sa	9975na 13760na	13615na
2300	0000		Australia, Radia 21740va	9660pa	12080pa	17715va	17795va	2300	0000		USA, WICR Upton KY USA, WRMI Miami FL	7490va 9955am 7510va	13595os 15285so		
2300 2300	0000	٧l	Comeraan, RTV/Yaaunde Conada, CBC Northern Service	4850da 9625da				2300	0000		USA, WSHB Cypress Crk SC USA, WTJC Newport NC USA, WWCR Noshville TN	9370no 3215am	5070am	7435am	13845am
2300 2300	0000		Canada, CFRX Taronto ON Canada, CFVP Calgary AB	6070da 6030da				2300	0000	1	USA, WWFV McCaysville GA	5085vo 3945do	6980va 4960da	7260da	13043011
2300 2300	0000		Canada, CHNX Halifax, NS Canada, CKZN St Jahn's NF	6130da 6160da				2300 2300 2300	0000 0000 2305	νl	Vanuatu, Radia Zambia, Christian Voice Nigeria, Radia/Enug	4965do 6025do	470000	720000	
2300 2300	0000		Conada, CKZU Vancauver BC Costa Rico, R for Peace Intl	6160do 15048vo	15065vo	21815usb		2300	2305	V.	Nigeria, Radio/Ibadan	6050do 4770do	6090do	7275do	9570do
2300 2300	0000		Casta Rica, University Network Egypt, Radio Cairo	15048vo 9900am	15065va	21815usb		2300 2300	2305	VI	Nigeria, Radio/Kaduna Nigeria, Radio/Lagos	3326do 3985vo	4990do	727300	737000
2300	0000	f/monthly	11720va		condv Weeke	nd Radio	11590va	2300	2315	ΨI	Italy, IRRS Vatican City, Vatican Radio	7305as 5960am	9600as 9755am	11830as 11865am	
2300 2300	0000	٧l	Ghana, Ghana BC Corp India, All India Radio	3366da 9705as	4915do 9950as	11620as	13605as	2300	2329	mtwhf	Canada, R Canada International Canada, R Canada International	6040am 9550am	11865om	13730am	
2300 2300	0000	٧l	Liberia, R Liberia International Malaysia, Radio	5100do 7295do				2300 2300	2330	mtwhf	Cuba, Radio Havana Mexico, R Mexico International Mangolia, Vaice of	9705am 12015as	11770am 12085as		
2300 2300	0000		Malaysia, RTM Kata Kinabalu Namibia, Namibian BC Corp	5980do 3270of	3289of			2300 2300	2330 2330		USA, VOA Special English 15395as	6045as	7140as	9545as	11925os
2300 2300	0000		New Zealand, ZLXA Palau, KHBN/Valce of Hope	3935do 9965os	9985as			2300 2300	2345 2345		Germany, Deutsche Welle USA, WYFR Okeechobee FL	9470as	9815as 11740na	13690as	17655os
2300	0000	vl/os	Sierra Leone, Sierra Leone BS Salaman Islands, SIBC	3316do 5020do 9545do				2300 2300	2356 2359		China, China Radio International New Zealand, R New Zealand Int	5990na 17675pa			
2300	0000	vl/o	Salamon Islands, SI8C Sri Lanka, Sri Lanka BC Corp	4940do 6020eu	9655na			2300	2359		Romania, R Romania International		9570no	9690eu	9690eu
2300 2300	0000		Turkey, Voice of UK, BBC World Service 6175nc	3915as 6195va	5965os 7105os	5975na 9590na	6035as 11945as	2330 2330	0000		Canada, & Canada International Malaysia, RTM Sarawak	5960om 7160do	9755am		
2300	0000	ło.	11955os UK, Global Kitchen/Merlin	12095sa 3955eu	15280as 6170eu	7165eu	1174303	2330 2330	0000		Netherlands, Radio Switzerland, Swiss R International	6165na 9885sa	9845na 11660sa		
2300	0000	fo	USA, Armed Forces Radio 6350vo 12579vo	4278va 6458va 12689va	4319va 6847va 13362va	4993va 10320va 16847va	5765va 10940vo	2330	0000		USA, VOA Special Eaglish 9545as 15205as	6045as 9620as 15395as	7130as 11805as	7130as 11925as	7140as 13745as
2300 2300	0000		USA, KAIJ Dallas TX USA, KTBN Solt Lake City UT	13815va 15590na				2330 2330 2330	2345 2357 2357	7	Libya, Voice of Africa Czech Rep, Radio Prague Intl Vietnam, Voice of	11815of 7345no 9839os	17725af 9435no 12019as		
2300 2300	0000		USA, KWHR Noalehu HI USA, Voice of America 7215as 15185as	17510as 9770as 15290as	9890as 15305po	11760as 17735pa	13690as 17740pa	2330	233/		vicingin, voice of	700703	1201703		

SELECTED PROGRAMS

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The World Today (the BBC's agenda-setting flagship glo-2300 BBOWS(am) bal news program) China R. Int News RA News R Austrolia News R. Progue

Sunday

2330

R. Canada Int. The World This Weekend (Larna Jackson presents a weekend news roundup and magazine) R. New Zealand Int. Midday Report (news updates and in-depth reports)* 2310 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region) China R. Int In the Spotlight (Chinese arts and cultural magazine) The Greenfield Collection (Edward Greenfield plays classical BBCWS(om) music requests and selections from his own collection) R. Australia Earthbeat (Alexandra DeBlas presents a program an envitonmental science) The Inside Track (Rabin Brown presents interviews and R. Canada Int. documentaries on the issues of sport) P Netherlands Spectrum (a weekly look at the people, places and events R. New Zealand Int.

Sincerely Yours (Veranica Wilson hosts RN's listener re-2335 R Netherlands

sponse program)

Mor	ıday	
2300	R. New Zealand Int.	Midday Report (news updates and in-depth reports)*
2310	R. Australia	Asia-Pacific (Radio Australia's flagship current events as business report for and about Asia and the Pacific regio
2330	Chino R. Int.	People in the Know (interviews with prominent Chine who are shaping the nation's future)
	R. Australia	Innovations (a program showcasing Australian invention enterprise and ingenuity)

Monday-Friday

R. Canada Int.	The World at Six (CBC Radio's major evening news pro- gram with Russ Germain and Barbara Smith)
R. Canada Int.	As It Happens (Barbara Budd and Mary Lou Finley inter view newsmakers from the famous to ordinary people evenitnessing news in the making)
R. Netherlands	Newsline (news, analysis and background reports)
	R. Canada Int.

Tuesday

R. New Zealand Int. Midday Report (news updates and in-depth reports)* Asia-Pacific (Radio Australia's flagship current events and R Austrolia business report for and about Asia and the Pacific region)

2330	Chino R. Int.	Sports World (the sports scene in Chino and Asia)
	R. Australia	Arts Talk (Julie Capeland/the world of arts and cultural ideas

Wednesday

2310	R. Australia	Asio-Pacific (Radio Australia's flagship zurrent events and busi- ness report for and about Asia and the Pacific realian)
2330	R. Austrolio	Rural Reporter (ABC's rural reporters cresent news and stories from rural and regional Australia)

HIDISOUY			
2300	R.	New Zealand	In.
2310	R.	Australia	

. Midday Report (news updates and in-depth reports)" Asia-Pacific (Radio Australia's flagship zurrent events and business report for and about Asia and the Pocific region) 2330 R Australia The Media Report (Mick O'Regan tales a critical look at the latest developments in the communications industry)

Friday

2300	R. New Zealand Ist.	RNZ News*
2310	R. New Zealand Irr.	Focus on Politics (a report on government and politics in NZ)*
2315	R. Australia	Lingua Franca (Jill Kitson presents a grogram about language and its social, cultural and historical ramifications)
2330	BBCWS(om)	Global Business (Peter Day charts the transformations sweep- ing through the world of work and commerce)
	China R. Int.	Life in China (a weekly magazine focusing on the lives of ordinary people in China)

In Conversation (Robin Williams talks not only to scientists, but also to those interested in the subject, about what it's meant to their lives)

New Zealand Int. The Sampler (Nick Bollinger casts a critical ear over the latest (D offerings)*

Saturday

Sau	uruay	
2300	a. Canada Int.	The World This Weekend (Lorna Jackson presents a weekend news roundup and magazine)
	. New Zealand Int.	RNZ News*
2305	& Austrolio	Ockham's Razor (sharp commentaries on scientific issues)
2310	. New Zeoland Int.	The Week in Parliament (NZ political news)*
2330	3BCWS(am)	Arts in Action (a weekly report on trends and develop- ments in the fine arts around the world)
	 Canada Int. 	Madly Off in All Directions (Host Lorne Elliott show- cases a mix of comedy, as well as muslc, improvisa- tion and satirical stand-up from all across Canada)
	₹. Netherlands	News
	WHRI(9495 kHz.)	Dring with Cumbre (Marie Lamb with the hottest DX catches)
2335	₹. Netherlands	Europe Unzipped (the events of the post week in Europe, same unusual)
	₹. Proque	Readings from Czech Literature
2340	₹. Prague	Saturday Music (Czech classical, folk, jazz or rock)
("This R	Na program airs ane h	aur UT later fram March 18.)

Thank You ...

Additional Contributors to This Month's Shortwave Guide:

John Babbis, Silver Spring, MD; Tom Banks, Dallas, TX; Bob Fraser, Cohasset, MA; Glenn Hauser, Enid, CK/World of Radio, DX Report; Hans Johnson, WY/Ulis Fleming, MD / Cumbre DX/DXing With Cumbre; BBCM; Robert E. Thomas, Bridgeport, CT; BBC On-Air; Harold Sellers, DX Ontario; Hard Core DX; Radio Sweden/Media Scan; Usenet Newsgroups; Worldwide DX Club.

Satellite Service Guide

All Frequencies MHz

GE Americom GE-6

_		
		- 72 degrees W. Long.
1(V)		Occasional video
		Occasional video
		Occasional video
4(H)	3780	Occasional video
5(V)	3800	Occasional video
6(H)	3820	Occasional video
7(V)	3840	Occasional video
8(H)	3860	Occasional video
9(V)	3880	Occasional video
10(H)	3900	Occasional video
11(V)	3920	Occasional video
12(H)	3940	Occasional video
13(V)	3960	Occasional video
14(H)	3980	Occasional video
15(V)	4000	Occasional video
16(H)	4020	Occasional video
17(V)	4040	Occasional video
18(H)	4060	Occasional video
19(V)	4080	Occasional video
20(H)	4100	Occasional video
21(V)	4120	Occasional video
22(H)	4140	Occosional video
23(V)	4160	Occasianal video
24(H)	4180	Occasional video

GE Americom GE-6

	Ku-Band	- 72	degrees	W.	Long
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Ku-I	Band - 72 degree
1(V)	117200ccasional video
2(H)	117400ccasional video
3(V)	11760 Occosional video
4(H)	11780 Occasional video
5(V)	118000ccasional video
6(H)	11820Occasional video
7(V)	11840Occasional video
8(H)	11860 Occasional video
9(V)	11880Occasional video
10(H)	11900Occasional video
11(V)	119200ccasional video
12(H)	11940 Occasional video
13(V)	11960 Occasional video
14(H)	11980 Occasional video
15(V)	12000 Occasional video
16(H)	120200ccasional video
17(V)	12040 Occasional video
18(H)	12060 Occasional video
19(V)	120800ccasianal video
20(H)	
21(V)	121200ccasional video

22(H) 12140 Occasional video

23(V) 12160 Occosional video

24(H) 12180 Occasional video 25(V) 11535 Occasional video

26(H) 115350ccasional video

27(V) 116550ccasional video

28(H) 116550ccasional video

Panamsat Galaxy 6

C-band - 74 degrees West Iongitude

1(H)	3720	Occasional video
2(V)	3740	CMT Asia Digit
3(H)	3760	Occasional video
4(V)	3780	Occasional video
5(H)	3800	Occasional video
6(V)	3820	'Occasional video
7(H)	3840	Occasional video
8(V)	3860	Occasional video
9(H)	3880	Occasional video
10(V)	3900	Occasional video
11(H)	3920	Occasional video
12(V)	3940	Occasional video
13(H)	3960	Occasional video
14(V)	3980	Occasional video
15(H)	4000	Occasional video
16(V)	4020	Occasional video
17(H)	4040	Occasional video
18(V)	4060	Occasional video
19(H)	4080	Occasional video
20(V)	4100	Occasional video
21(H)	4120	Occasional video
22(V)	4140	Occasional video
23(H)	4160	Occosional video
24(V)	4180	Occasional video

Panamsat SBS-6

Ku Rand 74 dammas W L

NU-DO	ina - 74	aegrees vv. Long
T01(H)	11725.0	Dato Transmissions
T02(V)	11749.5	CONUS Communications
		Digital
T03(H)	11774.0	Occasional video
T04(V)	11798.5	Occasional video
T05(H)	11823.0	CONUS Communications

ITC

ITC

CONUS Communications

T06(V) 11847.5

T19(H) 12166.0 Occasional video	T07(H) T08(V) T09(H) T10(V) T11(H) T12(V) T13(H) T14(V) T15(H) T16(V) T17(H) T18(V)	11872.0 11896.5 11921.0 11945.5 11970.0 11994.5 12019.0 12043.5 12068.0 12092.5 12110.0 12141.5	Occasional video Occasional video Occasional video Occasional video Occasional video Occasional video Data Transmissions Occasional video Data Transmissions Occasional video Occasional video Occasional video Occasional video
117(II) 12100.U UCCOSIONOI VIDEO			Occasional video
	117(H)	12166.0	Occasional video

Panamsat SBS-4

Ku-B	and - 77	degrees W. Long.
T01(H)	11725	Occasional video
T02(H)	11780	Occasional video
T03(H)	11823	Occasional video
T04(H)	11872	Occasional video
T05(H)	11921	Occasional video
T06(H)	11970	Occasional video
T07(H)	12019	Occasional video
T08(H)	12068	Occasianal video
T09(H)	12117	Occasional video
T10(H)	12166	Occasional video

GE Americom GE-5

XU-I 1(V) 2(H) 3(V) 4(H)	Band - 79 (11730.0 11743.0 11791.0 11804.0	degrees W. Long Data Transmissions/Utal State Educ Digital Data Transmissions Data Transmissions Empire Sports Network
'\'''	11004.0	Digital

Robert Smathers roberts@nmia.com

		0
5(V)	11852.0	CBS feeds - Digital
6(H)	11865.0	Data Transmissions
7(V)	11913.0	Data Transmissions
8(H)	11926.0	GE-5 ID Slate/Data Trans-
		missions
9(V)	11974.0	ABC feeds - ITC and Digi- tal
10(H)	11987.0	Occasional video
11(V)	12035.0	CNN feeds - ITC and Digi-
		tal
12(H)	12048.0	Occasional video
13(V)	12096.0	Occasional video
14(H)	12109.0	Occasional video
15(V)	12157.0	Occasional video/Data
		Transmissions
16(H)	12170.0	NY Net (Digital)/Data
		Transmissions

GE Americom Satcom K2

Ku-B	and - 81	degrees W. Long
T01(H)	11729.0	NBC feeds
T02(V)	11773.0	NBC feeds
T03(H)	11788.0	NBC feeds
T04(V)	11821.0	NBC feeds
T05(H)	11847.0	NBC feeds
T06(V)	11874.0	Data Transmissions
T07(H)	11921.0	NBC feeds
T08(V)	11942.0	NBC feeds
T09(H)	11970.0	NBC feeds
T10(V)	11994.5	NBC feeds
T11(H)	12019.0	NBC HDTV
T12(V)	12067.0	NBC feeds
T13(H)	12083.0	NBC feeds
T14(V)	12117.0	NBC feeds
T15(H)	12142.0	NBC feeds
T16(V)	12166.0	NBC NewsChannel
Dinital		





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View From Above

Lawrence Harris

Lawrence@itchycoo-park.freeserve.co.uk http://www.itchycoo-park.freeserve.co.uk/wxsats.htm

Eclipse Weather!

Ithough I originally set up my first weather satellite (WXSAT) system as the hardware for a new hobby, it was not long before I realized how useful the resulting pictures were. This was back in the mid-1980s, and the hardware required for receiving and decoding was available from a small number of suppliers. Groups of amateurs were forming clubs, and information about setting up receiving systems was slowly getting published. I joined one such organization – the Remote Imaging Group (RIG) – and discovered that many of its members were actively involved in other satellite groups, such as AMSAT.

One thing that membership quickly taught me is that with any hobby likely to involve buying new equipment, talking with like-minded hobbyists is a valuable source of advice for minimal cost. Check out your local groups by contacting the national organizations, where you may find that there is a local club just waiting to help.

http://www.rig.org.uk/ http://www.amsat.org/

If the weather forecasters were tuned to our specific needs, their broadcasts might be significantly different! I routinely monitor WXSAT images with the hope that an occasional clear night sky might provide an opportunity to spend some hours at the telescope. This was the case for the January 9, 2001, total eclipse of the Moon. We had previously had two clear nights, but during the hours before the eclipse a huge rain-bearing weather system arrived off southwest Britain, ready to provide complete cloud cover for the first lunar eclipse of the 21st century. The national forecasts showed that the whole of southern Britain would be under thick cloud cover, and my WXSAT monitoring system confirmed this probability

Leaving the WEFAX system animating infrared images of the region, the slow drift of the weather system could be seen by the most untrained of eyes. For those perhaps unfamiliar with the term WEFAX, it refers to the weather facsimile transmissions made by many of the geostationary WXSATs. These transmissions are usually on 1691.0 MHz and can be received by setting up a reception system pointed at GOES-8 and/or GOES-10, depending on your location. In Europe, we point our WEFAX dishes/Yagis at Meteosat-7.

The beauty of WEFAX is twofold: the hardware necessary for reception is inexpensive – requiring a Yagi or small dish, a receiver, and suitable decoding software – and secondly, the images are nearly continuous, with cycles of transmissions enabling ongoing animations.

During the afternoon of January 9, NOAA-

16 provided a high resolution image of western Europe. Because of an apparently faulty switch, NOAA-16's APT transmission - normally on 137.62 MHz - had not been re-enabled, as of early January. This coincided with a partial footprint overlap with NOAA-14 for a few weeks, so NOAA-16's APT would have been switched off anyway. (Hopefully, by the time this edition of MT is published, NOAA-16 will be an operational satellite, having completed all the scheduled tests.) The HRPT scanner and transmission system onboard NOAA-16 appear to be in perfect order, and I received consistent, good quality imagery. The visible-light image showed some thin sections of cloud that gave cause for some minor optimism that all might not be lost with the eclipse.



Fig 1: NOAA-12 1710 UTC January 9, 2001, HRPT infrared image (See "Letters" for the eclipse itself.)

The pass from NOAA-12 – see figure 1 – showed that some very dense cloud was around, but also revealed small areas of thinner cloud – and it was these that were to provide numerous tantalizing glimpses of the eclipse during the evening. I was able to observe and image the eclipsed Moon for short periods until after totality – proving the usefulness of the WXSAT monitoring.

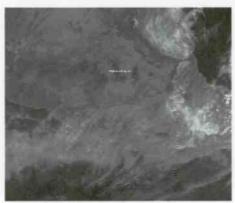


Fig 2: Meteor 3-5 1646 UTC December 27, 2001 – unfortunatally in black and white!

Tom Gwilym has been experimenting with the addition of color to Resurs and Meteor images, such as a subtle green for land areas. Tom uses an automatic recording system to record APT signals and process them later – correlating pass times with the logged recordings. Figure 2 shows Tom's processing of the north-bound Meteor 3-5 pass over California just after Christmas. Meteor 2-21 recently replaced Meteor 3-5 for a few weeks.

Joseph Gresham recorded this GOES-8 continental USA image showing the volcanic activity from Popcatapetl near Mexico City, showing



Fig 3: GOES-8 December 15, 2000 showing volcanic activity in Mexico.

Frequencies

NOAA-12 transmits APT on 137.50 MHz
NOAA-14 transmits APT on 137.62 MHz
NOAA-15 and NOAA-16 APT may remain off
NOAAs transmit beocon data on 137.77 or 136.77 MHz
Meteor 3-5 may transmit APT on 137.30 MHz when in sunlight
Resurs 1-4 transmits APT on 137.85 MHz
GOES-8 and GOES-10 use 1691 MHz for WEFAX

See ad for Swagur on page 89 for satellite weather equipment.

A GUIDE TO GOVERNMENT COMMUNICATIONS

larry@grove-ent.com

Monitoring the Department of Housing and Urban Development

his department in the United States government is responsible for the nation's housing needs and been a high profile agency since its birth. Created as part of President Lyndon B. Johnson's War on Poverty, the Department of Housing and Urban Development (HUD) was established by Congress in November 1965 as a Cabinet Department which consolidated a number of other older federal agencies.

The Department of Housing and Urban Development is the Federal agency responsible for national policy and programs that address America's housing needs, improve and develop the nation's communities, and enforce fair housing laws. HUD's business is helping create a decent home and suitable living environment for all Americans, and it has given America's cities a strong national voice at the Cabinet level.

However, HUD has a very low profile communications support structure. Not much has been known about its communications activities until now. In the United States very few locations have dedicated communications systems in place for day-to-day department communications. Here is what is known.

165.6625/169.100	Hortford, CT
165.6625/169.100	Boston, MA
165.6625/169.100	Notionwide allocation. Used to provide physical security to the HUD Secretory while on travel sta- tus.
168.0000 Simplex	Washington, D.C. KGU 70 Motor Paol (may no longer be in use)
408.400 Simplex	Atlanto, GA
408.400 Simplex	New York City, NY
409.500 Simplex	Chicogo, IL
417.950 Simplex	Washington, D.C., Maintenance Staff
418.075 Simplex	San Froncisco, CA
418.075 Simplex	Woshington, D.C., Computer Support Staff

♦ DOE Los Alamos Update

In the November 2000 edition of this column we presented information on several DOE trunked systems in the western United States. An anonymous contributor recently forwarded an update on this system.

Los Alamos National Lab, New Mexico

System: Ericsson EDACS

Frequencies: 406.350 (LCN1) 407.150 (LCN3) 407.350 (LCN6) 407.550 (LCN7) 407.950 (LCN2) 408.550 (LCN8) 408.750 (LCN4) 408.950 (LCN9) 409.550 (LCN5) 410.150 (LCN10)

Talkgroups:

02-015 Traffic Control (Roads and Grounds)
02-031 Misc Lab Divisions No specific IDs
02-041 Fire Dispatch/Enroute
02-042 Fire Department Tactical Chonnel 2

02-043	Fire Department Tactical Channel 3
02-044	Fire Department Tactical Channel 4
02-045	Fire Deportment Tactical Channel 5
02-046	Fire Department Tactical Channel 6
02-052	Pest Control (Roads and Grounds)
02-053	Misc Lab Divisions No specific IDs
02-095	Misc Lab Divisions No specific IDs
02-112	Fire Protection Alarm Repair and Maintenance
02-141	Fire Department Ambulonces to Hospital Emergency Root
02-143	Misc Lab Divisions No specific IDs
02-152	Operations Center (Tech Area 53)
03-003	Misc Lab Divisions No specific IDs
03-006	Misc Lab Divisions No specific IDs
03-022	Emergency Management vehicles (Hazmat)
03-051	Utilities
03-052	Utilities
03-071	Lab Security Dispatch (Pro Farce)
03-073	Lab Security Special Ops (Pro Force)
03-081	Utilities
03-094	Misc Lab Divisions No specific IDs
03-100	Scheduling ??
03-101	Security Gate (Sigma Site)
03-111	Emergency Manogement Dispatch
04-005	Lab Taxi Service
13-125	Access Control/High Explosive Testing Facilities

Many thanks to our western contributor for this update on Los Alamos. If you are monitoring a government trunk system, we want to hear from you. Contact us via email at the address above or at our snail mail address: The Fed Files, P.O. Box 98, Brasstown, NC 28902

♦ The FBI in West Virginia

Recently a source forwarded to us a profile on the FBI in West Virginia. Here is the background material on that state's communications system.

West Virginia FBI Offices:

(All counties in West Virginia covered by the Pittsburgh FBI Field Office)

KEX 673
KEX 670
Unknown
KEX 671
Unknown
KEX 668 (Note: This office might be closed LVH)
KEX 663

FBI PL Tone: 6Z (167.9 Hz) Used systemwide

Repeater output/Repeater input 165.9750/163.7500 Wheeling RA — Empire, Hancock

167.2625/163.7250 Clorksburg RA — Chestnut Ridge, Elkins
167.2875/163.7000 Beckley RA — Croigsville, Point Mtn, Rosedole,
Sugarloof, Wollback
Beckley RA — Bold Knob (possible talk around

167.3625/163.8375	Beckley RA — Bee Mtn, Kingston, Kapperstan, Malden Mtn (possible talk around also)
167.3875/163.7000	Beckley RA — Canaan, Kingston, Point Mtn, Rosedale
167.4125/163.7000	Beckley RA — Newton, Wallbock (possible talk around also)
167.4875/163.9625	Parkersburg RA — Buzzard, Hargreave, Kenna, Ravenswood, Spencer
167.5125/163.9125	Huntington RA — Barker Ridge, Centerville, German Ridge
167.5375/163.8625	Transportable Repeater
167.5375 Simplex	Beckley RA, Charleston RA, Huntington RA, Martinsburg RA, Parkersburg RA, Wheeling RA. The frequency 167.5375 is a nationwide common and extended car-ta-cor
167.5625 Simplex	Beckley RA, Charleston RA, Clarksburg RA, Hun- tington RA, Martinsburg RA, Porkersburg RA, Wheeling RA
167.5875/163,7250	Clarksburg RA — Chestnut Ridge, Davis Mtn, Elkins, Fort Hill
167.5875/163.9125	Huntington RA — Mann Knob, Rotory Park
167.6375 Simplex	Beckley RA, Charleston RA, Martinsburg RA, Parkersburg RA, Wheeling RA (possible talk around or dispatch)
167.6875/162.6125	Beckley RA — Bald Knob, Big Swell, Kopperston
167.7125/163.9625	Parkersburg RA — Buzzard, Horgreave, Kenna, Rovenswood, Spencer
167.7375/163.9125	Huntington RA — Huntington
167.7375/163.9625	Parkersburg RA — Hargreave, Kenna
167.7625/163.8375	Beckley RA — Bee Mtn, Malden Mtn
167.7875/163.8375	Beckley RA — Bee Mtn, Kopperston
167.7875/163.9125	Huntington RA — Mann Knob
168.350 Simplex	Clorksburg RA — Security Force
168.9000/163.8875	Wheeling RA — Moundsville
168.9500/163.7250	Clarksburg RA — Chestnut Ridge, Davis Mtn, Elkins, Fort Hill, Sand Springs
169.6250/163.9125	Clarksburg RA — Chestnut Ridge
169.7250/163.9125	Clarksburg RA — Chestnut Ridge
170.6250/163.7000	Beckley RA — Craigsville, Rosedale
170.7000/163.9125	Clorksburg RA — Chestnut Ridge
170.7750/163.8875	Wheeling RA — West Liberty

And that is it for this month's edition of The Fed Files. Now it is time to look at this month's federal spectrum scan in Table One. In this issue we continue our detailed look at the reorganized 406-420 MHz UHF federal land mobile service. 73 and good hunting.

Mortinsburg RA — Martins Hill

Clorksburg RA - Chestnut Ridge

Huntington RA - Barker Ridge

(which links the Beckley repeaters)

Clorksburg RA to Clorksburg PD link

Ravenswood, Spencer

mon Ridge, Rotory Peak

West Virginio Statewide

West Virginio Statewide

Clorksburg RA

Parkersburg RA - Buzzard, Horgreave, Kenna,

Huntington RA - Barker Ridge, Centerville, Ger-

Charleston RA fixed repeater to Bold Knob

170.8250/163.7000

170.8250/163.9625

170.9000/163.7250

170.9000/163.8375

170.9000/163.9125

170.9000 Simplex

170,9500 Simplex

412.4000

171.6250/166.2000

453,7000/458,7000

Table One: Federal UHF Land Mobile Service

- Frequency Ch/Paired Freq* Agencies 410.0000 312/419.0000 Air Force, Army, Energy Department, FAA, GSA, NASA, Novy, Post Office, US Information Agency, Veterans Administration
- 410.0125 313/419.0125 (No reported octivity)
- 410.0250 314/419.0250 Air Force, Army, Coast Guard, Energy Department, FAA, GSA, Health Resources and Services Administration (HHS), Labor Department (Nationwide), Navy, Post Office, US Information Agency, Veterans Administration
- 410.0375 315/419.0375 (No reported activity)
- 410.0500 316/419.0500 Census Bureau, Commerce Department, Energy Department, National Ocean Service, National Weather Service
- 410.0625 317/419.0625 (Na reparted activity)
- 410.0750 318/419.0750 National Weather Service-Interrogated ASOS weather data collection plotforms (Nationwide), Navy
- 410.0875 319/419.0875 (No reported activity)
- 410,1000 320/419,1000 National Weather Service-NOAA weather radio link (Notionwide)
- 410.1125 321/419.1125 (Na reported activity)
- 410.1250 322/419.1250 Energy Department, Environmental Research Lob
- 410 1375 323/419 1375 NASA
- 410.1500 324/419.1500 Federal Trunk Group 4 (paired with 418.1500): Air Force, Army, Energy Department, Environmental Research Lab, Notional Bureau of Standords, Navy
- 410.1625 325/419.1625 (No reported activity)
- 410.175D 326/419.1750 Army, Census Bureau, NASA, NOAA (Notionwide) 410.1875 327/419.1875 Interogency Law Enforcement UHF Interoperability Channel < Inap 2> (Paired with 419.1875-167.9 Hz PL-NAC \$68F) and
- UHF Interoperability Channel < Inop 8 > (Simplex -167.9 Hz PL-NAC \$68F) 410.2000 328/419.2000 Air Force, Army, Energy Department, FAA, Forest Service, Government Printing Office, Health Resources and Services Administration (HHS), Indian Health Service (HHS), NASA, Navy, Post Office (Nation-
- wide), US Information Agency, Veterans Administration
- 410.2125 329/419.2125 (No reported activity) 410.2250 330/419.2250 Army, Environmental Research Lab, Notional Ocean
- Service, Social Security Administration
 410.2375 331/419.2375 Interagency Law Enforcement UHF Joint Incident Response Calling Channel (Paired with 419.2375-No CTCSS-NAC \$68F) and UHF Joint Incident Response Channel < UHF-6 > (Simplex-CTCSS As Required-NAC SARF
- 410.2500 332/419.2500 Air Force, FAA-Various Digital Systems (Nationwide), Novy
- 410.2625 333/419.2625 (No reported activity)
- 410.2750 334/419.2750 Forest Service (Nationwide), NASA
- 410.2875 335/419.2875 (No reported activity)
- 410 3000 336/419 3000 FAA-Vorious Digital Systems (Nationwide), NASA 410.3125 337/419.3125
- (No reported activity)
- 410.3250 338/419.3250 Navy, Post Office (Nationwide), Veterans Administrotion
- 410.3375 339/419.3375
- (No reported activity)
 Energy Department (Nationwide), Post Office 410 3500 340/419 3500
- 410.3625 341/419.3625 (No reported activity)
- 410.3750 342/419.3750 Air Force, Coast Guard (Nationwide), Energy Department, Navy, Veterans Administration 410.3875 343/419.3875 (No reported activity)
- 410.4000 344/419.4000 Air Force, Army, Center for Disease Control, FAA, Forest Service, National Bureau of Standards
- 410.4125 345/419.4125 (No reported activity)
- 410.4250 346/419.4250 Environmental Research Lab (Nationwide)
- 410.4375 347/419.4375 Interagency Law Enforcement UHF Joint Incident Response Channel < UHF-1 > (Paired with 419.4375-CTCSS As Required-NAC \$68F) and UHF Joint Incident Response Channel < UHF-7 > (Simplex-CTCSS As Required-NAC \$68F)
- 410.4500 348/419.4500 Army, National Ocean Service (Nationwide), National Science Foundation (Nationwide)
- 410.4625 349/419.4625 (No reported octivity)
- 410.4750 350/419.4750 Notional Bureau of Standards, NOAA (Nationwide), **NOAA Air Operations Center**
- 410.4875 351/419.4875 (No reported octivity)
- 410.5000 352/419.5000 Census Bureau, Environmental Research Lab (Nationwide), National Ocean Service (Nationwide)
- 410.5125 353/419.5125 (No reported activity)
- 410.5250 354/419.5250 Army, Environmental Research Lab, National Ocean Service, Patent and Trademark Office
- 410.5375 355/419.5375 (No reported activity)
- 410.5500 356/419.5500 Census Bureou, NOAA (Nationwide)
- 410.5625 357/419.5625 (No reported activity)
- 410.5750 358/419.5750 National Weather Service-NOAA weather radia link (Notionwide)
- 410.5875 359/419.5875 (Na reported activity)
- 410.6000 360/419.6000 Bureau of Reclamation, FAA, Interior Department (Nationwide)
- 410.6125 361/419.6125 Interagency Law Enforcement UHF Interoperability
 Channel < Inap 3 > (Paired with 419.6125-167.9 Hz PL-NAC \$68F) and UHF Interoperability Channel < Inop 9 > (Simplex -167.9 Hz PL-NAC \$68F)
- 410.6250 362/419.6250 Bureau of Mines (Nationwide), Fish and Wildlife Service (Nationwide), Interior Department (Nationwide), National Park Service (Nationwide)

- 410.6375 363/419.6375 Interagency Law Enforcement UHF Joint Incident Response Channel < UHF-2 > (Paired with 419.6375-CTCSS As Required-NAC \$68F) and UHF Joint Incident Response Channel < UHF-8 > (Simplex-CTCSS) As Required-NAC \$68F)
- 410.6500 364/419.6500 FAA. National Bureau of Standards, Navy
- 410.6625 365/419.6625 (No reported activity)
- 410.6750 366/419.6750 National Bureau of Standards (Kationwide), NOAA (Nationwide)
- 410.6875 367/419.6875 (No reported activity)
- 410.7000 368/419.7000 Environmental Research Lab (Nationwide), Government Printing Office, NOAA
- 410.7125 369/419.7125 (No reported activity)
- 410.7250 370/419.7250 NOAA
- 410.7375 371/419 7375 (No reported octivity)
- 410.7500 372/419.7500 Army, Federal Reserve System, National Bureau of Standards National O:ean Service
- 410.7625 373/419.7625 (No reported octivity)
- 410.7750 374/419.7750 Agriculture Stabilization and Conservation Service, Bureau of Land Manokement (Nationwide), Farest Service (Nationwide)
- 410.7875 375/419.7875 (Na reported activity)
- 410.8000 376/419.8000 Energy Department (Nationwide)
- 410.8125 377/419.8125 Energy Department
- 410.8250 378/419.8250 National Bureau of Standards, National Ocean Service, NOAA
- 410.8375 379/419.8375 Interogency Low Enforcement UHF Joint Incident Response Channel < UHF-3> (Paired with 419.8375-CTCSS As Required-NAC \$68F) and UHF Joint Incident Response Channel < UHF-9 > (Simplex-CTCSS As Required-NAC \$68F)
- 410.8500 380/419.8500 NOAA
- 410.8625 381/419.8625 NASA
- 410.8750 382/419.8750 NOAA
- 410 8875 383/419 8875 (No reported activity)
- 410 9000 384/419 9000 Environmental Research Lab, FAA, Navy
- 410 9125 385/419 9125 (No reported activity)
- Commerce Department (Nationwide) 410.9250 386/419.9250
- 410 9375 387/419 9375 (No reported octivity)
- 410.9500 388/419.9500 National Weather Service-Interrogated ASOS weather data collection platforms (Nationwide), Navy
- 410.9625 389/419.9625 (No reported activity)
- 410.9750 390/419 9750 Census Bureau, Notional Ocean Service
- 410 9875 391/419 9875 (No reported activity)
- 411.0000 392/Simplex Marshals Service (Nationwide)
- 411.0125 393/Simplex (No reported activity)
- 411.0250 394/Simplex Energy Department (Nationwide), Justice Department (Nationwide), Navy
- 411.0375 395/Simplex (No reported activity)
- 411.0500 396/Simplex Marshals Service (Nationwide)
- 411.0625 397/Simplex (No reported activity)
- 411.0750 398/Simplex Bureau of Prisons, Energy Department (Nationwide), Immigration and Naturalization Service (Nationwide) (No reported activity)
- 411.0875 399/Simplex 411.1000 400/Simplex
 - Marshals Service (Nationwide) (No reported activity)
- 411.1125 401/Simplex
- Drug Enforcement Agency (Nationwide), FBI (No-411.1250 402/Simplex tionwide)
- 411,1375 403/Simplex (No reported activity)
- 411.1500 404/Simplex Energy Department (Nationwide), FBI (Nationwide), FEMA, Marshal Service, State Department 411.1625 405/Simplex (No reported activity)
- 411.1750 406/Simplex
- Bureou of Prisons, Drug Enforcement Agency, FBI, Immigration and Naturalization Service (Nationwide), Marshal Service
- 411.1875 407/Simplex (No reported activity)
- 411.2000 408/Simplex Energy Department (Nationwide) (No reported octivity)
- 411.2125 409/Simplex
- 411.2250 410/Simplex Agriculture Department (Nationwide), Agricultural Research Service, Animal and Plant Health Inspection Service, Forest Service,
- NASA, Soil Conservation Service
- 411.2375 411/Simplex (No reported octivity) 411.2500 412/Simplex Agriculture Department (Nationwide), Agricultural
- Research Service, Animal and Plant Health Inspection Service, Federal Reserve System, Forest Service, Navy, Veterans Administration
- 411.2625 413/Simplex (No reported activity)
- 411.2750 414/Simplex Agriculture Department (Nationwide), Animal and Plant Health Inspection Service, Forest Service, Post Office, Soil Conservation Service
- 411.2875 415/Simplex (No reported activity)
- 411.3000 416/Simplex Agriculture Department (Nationwide), Animal and Plant Health Inspection Service, Federal Grain and Inspection Service (Nationwide), Forest Service
- 411.3125 417/Simplex Forest Service
- 411.3250 418/Simplex Agriculture Department (Nationwide), Agriculture Research Service, Animal and Plant Health Inspection Service, Forest Service, Navy, Soil Conservation Service
- 411.3375 419/Simplex (Na reported activity) 411.3500 420/Simplex
- Agriculture Department (Nationwide), Agriculture Research Service, Air Farze, FBI, Federal Grain Inspection Service, Farest Service, Labor Department, NASA, Navy, Post Office, TVA
- 411.3625 421/Simplex (No reported activity)

- 411.3750 422/Simplex Agriculture Department (Nationwide), FEMA, Forest Service
- 411,3875 423/Simplex (No reported activity)
- 411.4000 424/Simplex Agriculture Department (Nationwide), Air Force, Bureau af Land Management (Notionwide), Farest Service, Library of Congress, Navy, Post Office, Veterons Administration
- 411,4125 425/Simplex (No reported activity)
- 411.4250 426/Simplex Agriculture Department (Nationwide), Forest Service, Soil Conservation Service, State Department, Veterons Administration
- 411.4375 427/Simplex (No reported octivity)
- Agriculture Department (Nationwide), Air Force, 411 4500 428/Simplex Army, Centers for Disease Control, FAA, Forest Service, NASA, National Institute of Health, Navy, Post Office, TVA
- 411.4625 429/Simplex (No reported octivity)
- 411.4750 430/Simplex Agriculture Department (Nationwide), FEMA, Forest Service
- 411.4875 431/Simplex Forest Service
- Agriculture Department (Nationwide), Air Force, 411.5000 432/Simplex Army, Forest Service, Labor Department (Nationwide), Navy, Post Office
- 411.5125 433/Simplex (No reported activity)
- Agriculture Department (Nationwide), Animal and 411.5250 434/Simplex Plant Health Inspection Service, Bureau of Land Management, Forest Service, IRS TVA
- 411.5375 435/Simplex (No reported octivity)
- Agriculture Department (Nationwide), Air Force, FAA. 411.5500 436/Simplex Forest Service, IRS, NASA, National Gallery of Art, Navy, Post Office, Soil Conservation Service, TVA
- 411,5625 437/Simplex (No reported octivity)
- Agriculture Department (Notionwide), Army, Energy 411.5750 438/Simplex Department, Forest Service, Post Office, TVA
- 411.5875 439/Simplex (No reported activity)
- 411.6000 440/Simplex Energy Department (Notionwide), Navy
- 411.6125 441/Simplex (No reported activity)
- 411.6250 442/Simplex Bureau of Indian Affairs, Bureau of Land Management, Bureau of Reclamation, Fish and Wildlife Service, Interior Department (Naticawide), Notional Park Service, Navy, Post Office, TVA
- 411.6375 443/Simplex Energy Department
- 411.6500 444/Simplex Bureau of Indian Affairs, Bureau of Reclamation, Energy Department, Geologic Survey, Interior Department (Nationwide), International Boundary and Water Commission, National Park Service, Navy, Post Office, TVA
- 411.6625 445/Simplex **Energy Department**
- 411.6750 446/Simplex Bureau of Indian Affairs, Bureau of Land Management, Energy Department, Fish and Wildlife Service, Interior Department (Na-
- tionwide), National Park Service, TVA
- 411.6875 447/Simplex **Energy Department** Energy Department, Fish and Wildlife, Interior De-411.7000 448/Simplex partment (Nationwide), National Park Service, TVA, US Information Agency
- **Energy Department**
- 411.7125 449/Simplex 411.7250 450/Simplex Bureau of Indian Affairs, Geologic Survey, Interior Department (Nationwide), National Park Service, TVA
- 411.7375 451/Simplex Energy Department
- 411 7500 452/Simplex Bureau of Land Management (Nationwide), Interior Department (Nationwide)
- 411.7625 453/Simplex (No reported activity)
- Bureau of Indian Affairs, Geologic Survey, Interior 411.7750 454/Simplex Department (Nationwide), National Park Service, Post Office, TVA
- 411.7875 455/Simplex (No reported activity)
- 411.8000 456/Simplex Agriculture Department (Nationwide), Interior Department (Nationwide) 411.8125 457/Simplex (No reported activity)
- 411.8250 458/Simplex
- Bureau of Land Management, Bureau of Reclomation, Energy Department, Interior Department (Nationwide), National Park Service, TVA 411.8375 459/Simplex (No reported octivity)

Air Force, Bureau of Indian Affairs, Energy Depart-

ment, Interior Department (Nationwide), Office of Surface Mining, National Park Service

411.8500 460/Simplex

- 411.8625 461/Simplex (No reported activity) 411.8750 462/Simplex Bureau of Indian Affairs, Bureau of Land Management, Energy Department, Geologic Survey (Nationwide), Interior Department
- (Notionwide), National Park Service, TVA 411.8875 463/Simplex (Na reported activity) 411.9000 464/Simplex Geologic Survey, Interior Department (Nationwide),
- National Park Service
- 411.9125 465/Simplex (No reported activity) 411.9250 466/Simplex Bureau of Land Monagement (Nationwide), Interior Department (Nationwide), National Park Service
- 411.9375 467/Simplex (No reported octivity) 411.9500 468/Simplex
- Energy Department, Fish and Wildlife Service, Forest Service, Geologic Survey, Interior Department (Nationwide), National Park Service, Navy, TVA 411.9625 469/Simplex (Na reported activity)
- tionwide) 411.9875 471/Simplex (No reported activity)

411.9750 470/Simplex

FEMA, Geologic Survey, Interior Department (Na-

TRACKING THE TRUNKS

TECHNOLOGY, EQUIPMENT, FREQUENCIES AND NEWS

Don Veeneman

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Public Access Trunked Radio

canner listeners in the United States typically encounter one of the "big three" trunked radio systems, either Motorola, Enhanced Digital Access Communication System (EDACS), or Logic Trunked Radio (LTR). These radio formats are supported by scanner manufacturers and are relatively easy to monitor.

However, there are many other trunked radio systems operating in the world, and this month we'll take a look at one of them.

♦ MPT 1327

In the early 1980s the Department of Trade and Industry in the United Kingdom wanted government agencies to be able purchase radio equipment from different manufacturers yet have them all work together. The Department felt that competition was healthy and would eventually provide the best value to the user. None of the existing systems they examined were acceptable, mainly because the UK wanted a non-proprietary standard that could be used by anyone without restriction.

So the UK government set about creating an open standard. In return for the cooperation of a number of equipment manufacturers, the government reallocated the old Band III television frequencies (175 MHz to 225 MHz) for public access trunked radio.

Manufacturers including GEC Marconi, Motorola, Philips and Tait joined a consortium and over a five-year period produced a series of technical specifications for a trunked radio system. These specifications begin with "MPT" (Ministry of Post and Telegraph) and are referenced by a document number. Document 1327, along with several other documents, lay out the signaling, protocols, and interfaces that make up the core of an "MPT 1327" radio system.

The first base station began full operation from London in 1987 and soon afterward a number of MPT 1327 systems were operating in Europe. Several Asian nations now have MPT 1327 networks, as do Australia, Canada, Mexico, and South Africa.

Proponents claim it is the most popular trunking radio format in the world, except for the United States. They charge that Motorola has prevented the widespread adoption of MPT 1327 in U.S. in order to benefit sales of their proprietary systems, such as Privacy Plus and SmartNet.

Since the MPT 1327 protocol is open and essentially unencumbered (outside of the U.S.) by intellectual property claims, many manufacturers produce MPT 1327 equipment and users have many vendors from which to choose. Inside the U.S., however, Motorola holds patents on key parts of MPT 1327 and has, in effect, prevented MPT 1327 from becoming widespread in their home country. Interestingly, Motorola actually builds a significant number of radios for MPT 1327 systems; however, they are for use outside of the United States.

♦ MPT 1327 Control Channels

As with most trunked radio systems, MPT 1327 has both control and voice channels.

A control channel continuously transmits digital information from a base station to

mobile radios (the outbound or forward direction) at 1200 bits per second using a method known as fast frequency shift keying (FFSK). Over the air, data bits are represented as audio tones, with a 1200 Hz tone acting as a '1' and an 1800 Hz tone acting as a '0' bit.

The control channel is divided up into timeslots, each containing 128 data bits. Since the bit rate is 1200 bits per second, a timeslot is about 107 milliseconds (just over a tenth of a second) in duration.

Each of the 128-bit control channel timeslots contains a message with instructions for one, some, or all of the mobile radios that are listening. These messages include:

ALOHA

The base station is ready to accept a call request.

AHOY

The base station is calling a mobile radio.

ACKNOWLEDGE

The message has been received. **CLEAR**

End the call (referred to as a "clear down" or "tear down").

GO TO CHANNEL

Instruct a mobile radio to switch to a particular channel.

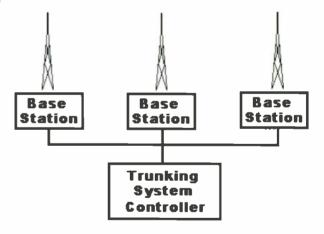
REQUEST

A mobile request to start ("set up") a call.

When a mobile radio isn't busy doing something, it will be tuned to the control channel and decoding the messages coming from the base station. When a mobile sends a message to the base station it will be on the *in-bound* (or *reverse*) control channel.

♦ ALOHA from Hawaii

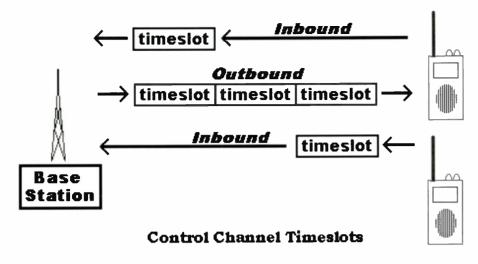
As a sidebar, you may notice that the word "ALOHA" is an odd choice for a message word. It actually comes from a series of communication experiments performed at the



Generic MPT 1327 System

University of Hawaii in the late 1960s and early 1970s. In those experiments, a central computer transmitted messages to a number of remote transceivers on a single radio frequency. These remote transceivers all communicated back to the central computer on a second, shared radio frequency. One of the problems that surfaced was, what if more than one remote transceiver wanted to use the shared frequency at the same time?

In the original system, called ALOHA, a remote transceiver simply transmitted whenever it wanted to. If it was the only one transmitting, the central computer received the



message just fine and would transmit an acknowledgment back to the sender. The sender would then know that the message got through correctly.

If, on the other hand, another remote transceiver decided to transmit while the first one was transmitting, the central computer would receive only a garbled message and would not send any acknowledgments. If a remote transceiver did not get an acknowledgment back after transmitting, it was programmed to wait a random amount of time and transmit the message again. Since the random time intervals would in all probability be different for each sender, their next transmissions would most likely not interfere with each other.

A refinement of this system specified that the remote transceivers had to start their transmissions only at certain intervals, all synchronized to each other by a timing signal sent from the central computer. This further reduced the likelihood of interference and doubled the performance of the system. This refinement became known as "slotted ALOHA" and the first, simpler method was called "unslotted ALOHA."

And that's how part of Hawaii came to the United Kingdom.

◆ ALOHA and Timeslots

Anyway, an MPT 1327 base station transmits ALOHA messages on the outbound channel indicating the number of inbound control channel timeslots that are available for mobiles to use. In a relatively quiet system, this number would be 1, meaning the next timeslot is available. As the load on the system increases, this number may go to 2, meaning the next two timeslots are available. A mobile requesting service would randomly select one of two inbound timeslots in which to transmit. This effectively spreads the inbound load and reduces the chance of two mobiles interfering with each other (a *collision*, or call clash).

Here's a simple example of how a typical call might progress in a MPT 1327 system.

- A mobile radio wishes to contact another mobile radio.
- The calling mobile listens to the outbound control channel for the ALOHA message. It selects the proper inbound timeslot in which to transmit.
- At the proper moment, the calling mobile transmits a REQUEST with the identity of the second mobile.
- The base station responds by transmitting an AHOY message with the identity of the second mobile on the outbound channel.
- •The calling mobile hears the AHOY and knows that its request was received.
- The second mobile hears the AHOY and transmits an ACKNOWLEDGE to the base station
- The base station transmits a GO TO CHANNEL command to the mobiles, instructing them to retune to a voice channel and start their conversation.

A single control channel can typically support about two dozen voice channels and can operate in one of two ways, either dedicated or non-dedicated. A dedicated control channel is permanently available for signaling. A non-dedicated control channel may be used for traffic (voice or data) if all the other channels are busy. Typically a system with only a few channels may choose to use a non-dedicated control channel, while a system with many channels will have one or more dedicated control channels.

MPT 1327 itself can support as many as 1,024 radio channels, which leaves quite a bit of room for expansion. It also allows for more than 32,000 system identities and over a million unit addresses, which can be used for either individuals or groups. A mobile address is made up of a seven-bit prefix in the range 000 to 127 and a 13-bit identity between 2 and 8,100. A mobile radio may be programmed with several addresses for individual identification and group affiliation. In addition, a MPT 1327 radio also contains a 38-bit security number that does not change

and can be checked over the air.

Under MPT 1327, radios can make a number of different types of calls, including speech (normal or high priority), group calls, announcements, data, emergency, status messages and short data messages.

Monitoring MPT 1327

Although few and far between, a number of MPT 1327 systems are currently operating in the United States, including Missouri, New York, and Texas. I'd love to give you frequencies and group identifiers, but I don't have any! So if you're monitoring these systems, send me an e-mail about what you've found.

Scanner listeners have a couple of options when it comes to monitoring MPT 1327 systems.

WiNRADiO offers a "Trunking Option" to their receiver software. This option works for Motorola Type I and II as well as MPT 1327 and uses a PC sound card to decode control channel information.

The software can operate in one of two modes, either "single-receiver" or "dual-receiver." In single-receiver mode, the unit tunes to the control channel and decodes enough information to re-tune to an active voice channel. When the transmission on the voice channel finishes, the radio switches back to the control channel and waits for the next transmission. In dual-receiver mode, two receivers are required. The first receiver stays tuned to the control channel and instructs the second receiver to tune to the proper voice channel and unmute the speaker.

The WiNRADiO Trunking Option also allows the user to log activity and automatically build up databases of trunking networks, and reportedly works with all versions of WiNRADiO receivers.

A group in Australia is also offering an MPT 1327 monitoring solution, in this case using a custom-built decoder box and software under Microsoft Windows. Audio output from your scanner is fed to the decoder, which forwards the decoded information via a serial port to the computer. A second scanner is required to actually hear the conversations, since the decoder needs the scanner to stay tuned to the control channel.

According to the website for this package, lan Wraith developed the hardware and software in the United Kingdom, but the decoder box is being built in Australia. It lists support for WiNRADiO receivers as well as AOR 3000 and 3000A scanners and any receiver that supports the lcom CI-V interface.

More information and links are available on my website at http://www.signalharbor.com, and I welcome your electronic mail to dan @ signalharbor.com. As always, I'd love to hear about the trunked systems you're monitoring, especially if it's MPT 1327. Until next month, happy monitoring!



Monitoring Military Flight Demonstration Groups

here is no thrill as great as watching the Blue Angels or Thunderbirds flight demonstration team strut their stuff in front of thousands of fans, unless it's adding the element of radio to the visual drama. The 2001 air show season starts this month, so we present Milcom's annual review of equipment to use, frequencies to monitor. and the military flight demonstration team schedules for the year (Table One).

Any Old Scanner Not Will Do

Most of the handheld scanners currently being marketed are not suited for air show monitoring. All of the Uniden brand scanners currently being sold (except for the BC-780) cannot be used for air show monitoring due to their lack of independent mode selection. If you are going to an Air Force Thunderbird show you will need a scanner that can monitor the 138-150 MHz military land mobile band in the AM mode.

You also need a scanner that has the 225-400 MHz military aeronautical band in it. Most of the action (especially the Blue Angels) will be heard in this UHF portion of the spectrum. This criteria narrows down our choice of scanners even more.

I am frequently asked on the Grove Tech line what scanner we do recommend for air show monitoring. Below is a list of those units that we feel should be considered for this task. This list has grown considerably over last year's edition, and I am happy to report that scanner enthusiasts now have a wider range of products and prices to chose from. We have also included in this year's list base/mobile models that would be suitable for monitoring, plus a couple of inexpensive portable power supplies you can use to power these rigs at the show.

Information below includes current Grove stock codes/prices for the items indicated, but the price does not include shipping or taxes (if applicable). Prices are subject to change without notice, so be sure to call our order department at 800-438-8155 for current pricing.

Hondheld Unit	Grove Stack No.	Price
Alinco DJ-X2T	SCN03	\$299.95
Alinco DJ-X10T	SCN01	\$359.95
AOR AR-8200 Mk IIB	SCN50	\$559.95
Icom R-2	SCN05	\$189.95
Icom R-3	SCN07	\$499.95
Icom R-10	SCN04	\$289.95
Yaesu VR-500	SCN06	\$324.95



Grove Stock No.

Fat Albert's jet assist - Johnny Autery

Rose/Mohile Unit

WinRodio WR-3700i-DSP

DOJO MODITO OTITI	DIDTO STOCK ITO.	riice
AOR-3000AB	SCN26	\$1062.95
AOR-5000 + 3	RCV42P	\$2139.95
AOR-8600	SCN08	\$899.95
Icom R-8500	RCV14	\$1469.95
JRC NRD-545	RCV21DS/	\$1795.95
w/converter	ACC11DS	+ \$349.95
Uniden BC-780		
Bose/Mobile	SCN49	\$349.95
Yaesu VR-5000	RCV51	\$899.95
Computer Receivers	Grove Stock No.	Price
Computer Receivers Icom PCR-100	Grove Stock No. RCV44	Price \$199.95
Icom PCR-100	RCV44	\$199.95
Icom PCR-100 Icom PCR-1000	RCV44 RCV45	\$199.95 \$349.95
Icom PCR-100 Icom PCR-1000 WinRadio WR-1550e	RCV44 RCV45 RCV47-E	\$199.95 \$349.95 \$549.95
Icom PCR-100 Icom PCR-1000 WinRadio WR-1550e WinRadio WR-1550i	RCV44 RCV45 RCV47-E RCV47-I	\$199.95 \$349.95 \$549.95 \$499.95
Icom PCR-100 Icom PCR-1000 WinRadio WR-1550e WinRadio WR-1550i WinRadio WR-3150e	RCV44 RCV45 RCV47-E RCV47-I RCV48-E	\$199.95 \$349.95 \$549.95 \$499.95 \$1849.95
Icom PCR-100 Icom PCR-1000 WinRadio WR-1550e WinRadio WR-1550i WinRadio WR-3150e WinRadio WR-3150i-DSP	RCV44 RCV45 RCV47-E RCV47-I RCV48-E RCV48-I	\$199.95 \$349.95 \$549.95 \$499.95 \$1849.95 \$1849.95

Portable Power Sources		
for Base/Mabiles	Grove Stock No.	Price
WinRadio Portable Power Source	PWR05	\$199.95
Portable Power Station	PWR01	\$69.95

RCV50-I

\$2895.95

Another purchase you should consider is an extra set of charged batteries for your handheld. Murphy's law ensures that your NiCads will die half way through the show with your replacements at home in the shack.

Finally, if you'd like to see this list expanded to include used equipment or antennas, let me know and we'll show them next year. Email to: larry@grove-ent.com.

So where is the action?

You will need to concentrate on three different bands for air show activity. Search in the 138-150.8 MHz band (minus 144-148, in both the AM and Narrow FM modes in 12.5 kHz steps), 118-136 MHz (AM mode in 25 kHz steps), and finally 225-420 MHz (AM in 225-400 in 25 kHz steps/Narrow FM in 406-420 MHz in 12.5 kHz steps).

The following discrete frequencies were reported in use by the U.S. Navy Blue Angels during the previous two seasons.

U.S. Navy Blue Angels Frequency Usage

roquoncy	o sug c
142.000	Ground support (Comm Cart)
143.600	Ground support, occasional Air-to-Air reported here
164,900	Engine Start/Taxi Out Ground support (Comm Cart)
168.900	Engine Start/Taxi Out Ground support (Comm Cort)
169.400	Engine Start/Taxi Out Ground support (Comm Cart)
170.900	Engine Start/Taxi Out/Maintenance Ground support (Comm C
236.450	Miscellaneous Air-to-Air (Eastern U.S.)
238.150	Show center/Delta formation (Eastern U.S.)
251.600	Sola formation (Aircraft 5/6) Air-to-Air
256.250	Usage unknown
263.350	Fat Albert (Blues C-130 Transport Aircraft), plus FA JATO fl
	demonstrations
263.500	Blue Angels/Fat Albert
264.550	Diamond/Solo formations
275.350	Diamond formation (Aircraft 1-4) Air-to-Air
286.000	Usage unknown
302.150	Miscellaneous Air-ta-Air (Western U.S.)
307.700	Show center/Delta formation (Western U.S.)
321.100	Blue Angel Operations
345.900	Solo formation (Aircraft 5-6) Air-to-Air

The U.S. Air Force Thunderbirds are always a crowd favorite. The following frequencies have been reportedly used by the Thunderbirds during the last couple of sea-

U.S. Air Force Thunderbirds

140.400	Johbou Miciali: Closs Contills Mil-10-Mil
141.850	Four ship formation (Victor 1) Show Air-ta-Air which is linked
	to public address system (AM mode)
143.850	Four ship formation (Victor 2) air-to-air which is linked to pub-

lic address system (AM mode) 235.250 Thunderbird Control

269,900 Thunderbird Control to Air Boss 322.950 Solo aircraft (5-6) Show Air-to-Air

Maintenance/ground teams < channel 1 > (NFM 146.2 PL 413.025

413.100 Maintenance/ground teams < channel 2>

Both the Navy and the Air Force have aircraft special demonstration units in addition to the flight demonstration units mentioned above. Here is a list of known units and their frequencies.

US Air Force A-10 Flight Demo Teams (Nationwide): 32,350 34,125 34.175 34.375 34.575 36.150 36.350 36.850 38.670 40.200 46.650 49.750 139.675 140.000 (all tentotive identifications, confirmation requested)

US Air Force F-15 Flight Demo Team (Misc): 275.675

US Air Force F-15 Flight Demo Team (East): 228.450 233.525 238.825 252.775 257.075 264.975 276.675 282.675 282.800 (S) 298.350 359.225

US Air Force F-15 Flight Demo Team (West): 384.550

US Air Force F-16 Flight Demo Teams (Shaw units): 260.400 282.800 US Air Force F-117 Flight Demo Discrete: 304.900 (very tentotive) US Navy F-14 Flight Demo Teams: 299.500 311.500 341.200 342.900 342.950 345.000

US Navy F/A-18 Flight Demo Teams: 333.300 (very tentative)
US Coast Guard Rescue Demo Teams: 381.800

Military Parachute Teams

The colorful U.S. Navy Seal Parachute Team, known as the Leap Frogs, are frequent visitors around the country at various sporting events and air shows. Look for their communications on 407.500 MHz.

The U.S. Army Parachute Team is known as the Golden Knights. They also make the rounds during the air show season. Look for their communications on 123.400, 123.475 or 123.500 MHz. You should also keep an eye on 32.300, 122.575, and 367.700 MHz for possible activity.

♦ Foreign Air Demonstration Teams

The Canadian Forces aircraft demonstration team is known as the Snowbirds. The following have been recently reported for this popular aerial team: 246.500, 272.100, 299.500, and 333.300 MHz.

Several years ago Daryll Symington in his popular book *Monitoring The Military* had the channel list below for the Snowbird team. It is unknown how accurate that list is now and we provide it here only for reference purposes.

227.600 (F4), 236.600 (F15), 239.800 (F20), 240.500 (F6), 245.000 (F19), 245.700 (F11), 266.300 (F8), 272.100, 275.800 (F1), 283.900 (F16), 289.400 (F18), 294.500 (F9), 295.600 (F2), 310.800 (F3), 316.500 (F12), 322.800 (F10), 344.500 (F13), 356.600 (F14), 363.800 (F17), 378.500 (F7)

Some other foreign and US flight demonstration teams that have been reported to us this last year include:

130.500	Sponish Military Aguila Flight Demonstration Team
136.175	Chilean Military Halcones Flight Demonstration Team
136.975	UK Army Air Corps Blue Eagles Helicopter Flight Demonstration
	Team
138.450	France Air Force La Patrouille Adecco Flight Demonstration Team
141.825	Fronce Air Force La Patrouille Adecco Flight Demonstration Team
143.100	France Air Force La Patrouille Adecco Flight Demonstration Team
243.450	UK Air Force Red Arrows Flight Demonstration Team
252.500	Sponish Military Aguilo Flight Demonstration Team
255.100	UK Air Force Falcons Flight Demonstration Team
264.400	Turkish Military Stors Flight Demonstration Team
279.600	Turkish Militory Stors Flight Demonstration Team
288.850	Swiss Military Patrouille Suisse Flight Demonstration Team
307.800	Italian Military Frecce Tricolori Flight Demonstration Team
465.100	UK Air Force Folcons Flight Demonstration Team
469.500	US Confederate Air Force Tora Team
469.550	US Confederate Air Force Tora Team

During the 2000 season we want to hear from our readers about active demonstration/air show frequencies. If you attend an air show, please pass along what you hear! You can reach me via e-mail at larry@grove-ent.com with a subject line of Airshow Intercepts, or you can write us at: Milcom, P.O. Box 98, Brasstown, NC 28902.

Thanks to our many contributors who took the time to share their air show reports with us last year. In the meantime, we will see you again in two months and good hunting to all.

Table One: Military Demonstration Teams 2001 Performance Schedule

	lable One: Military Demonstration	leams 2001 P	errormance schedule
Demonstration sched	lules dates are subject to change.	June 30-July 1	BA: Evonsville, IN; GKBT: Trovis AFB, CA; GKGT:
Group Abb		,	Cloyton, NY
BA = USN Blue Ange		July 1	TB: Niagara Falls, NY; SB: Canada Day - Ottawa, ON
TB = USAF Thundert		July 4 July 7-8	TB/SB: Battle Creek, MI BA: Muskegon, MI; TB: Pape AFB, NC; SB: Moose
SB = Canodian Snov GKBT = Golden Knigl		July 7-0	Jaw, SK; GKBT: Opsail 2000, NYC; GKGT: Cape
GKGT = Golden Knigl	· · · · · ·		Giradeau, MO
	hts Headquarters Unit	July 13-14	BA: Pensacolo Beach, FL
	• •	July 14	TB: Columbus AFB, MS
Base Abbre AFB = Air Force Ba		July 14-15 July 15	GKBT: Pensacolo, FL; GKGT: Davenport, IA TB: San Angelo, TX
ANG = Air National		July 21-22	BA: Bozeman, MT; TB/GKBT: Dayton, OH; SB: Fort
ARB = Air Reserve B		20., 2. 22	St. John, BC; GKGT: Selfridge, MI
JRB = Joint Reserve	Base	July 25	TB: Cheyenne, WY; SB: Smithers, BC
MCAS = Marine Co	• •	July 28	SB: Kelowno, BC
NAF = Naval Air Fa NAS = Naval Air Sta		July 28-29	BA: NAS Lemoore, CA; TB: Latrobe, PA; GKBT: Bill- ings, MT; GKGT: Elmendorf AFB, AK
DIC IIM IDVDH — CAN	IIUII	July 29	SB: Comox, BC
Dates	Group: Locations	August 1	SB: Trail, BC
March 10	BA: NAF El Centro, CA	August 4-5	BA: Seattle, WA; TB: Otis ANG Base, MA; SB: Red
March 15-16	GKGT: Style Team LULAC Youth Conference, Tucson		Deer, AB; GKBT: North Bay, ON; GKGT: Mountoin
March 17-18	AZ BA: Mesa, AZ	August 8	Home, ID SB: Cranbrook, BC
March 18	GKBT: Boy Scout Jamboree Atlanta, GA	August 10	SB: Abbotsford, BC
March 21	GKHQ: Army NASCAR Introduction Stanley, NC	August 11	TB: Minot AFB ND
March 24	TB: Patrick AFB, FL	August 11-12	SB: Abbotsford, BC; GKGT: Westover MA
March 24-25	BA: Altus AFB, OK; GKBT: Punta Gorda, FL; GKGT: Riv-	August 12	TB: Ellsworth, AFB, SD; GKBT: Champlain Valley, VT
Harrh OF	erside, CA	August 18-19	BA: Kansas City, MO; TB: Chicago, IL; SB: Lethbridge, AB; GKBT: Bloomington, IL
March 25 March 31-April 1	TB: Tyndoll AFB, FL BA: MCAS Cherry Point, NC; TB: Glendole, AZ; GKBT:	August 19	GKGT: National Science Center Augusta, GA
mulch 31-April 1	Tyndall AFB, FL; GKGT: Augusta, GA	August 21	GKBT: "Army Night" Cominsky Park Chicago, IL
April 7	TB: NAS Point Mugu, CA	August 23	SB: Windsor, ON; GKBT: Saratoga, NY
April 7-8	BA: MacDill AFB, FL	August 25	SB: St. Georger, PQ
April 8	TB: Beale AFB, CA	August 25-26	BA: Duluth, MN; TB: Mid-season break; GKBT: Roch-
April 14-15	GKBT: Chattanooga, TN	August 24	ester, NY; GKGT: Offutt AFB, NB
April 21-22 April 21	BA: NAS Corpus Christi, TX TB: Barksdale AFB, LA	August 26 August 29	SB: Mont Joli, PQ SB: Brantford, ON
April 22	TB: Maxwell AFB, AL	September 1	GKGT: VA Tech vs Akron Blacksburgh, VA
April 28-29	BA: NAS Narfolk, VA; TB: Lincoln ANG Base, NE; SB:	September 1-3	BA/GKBT/GKGT (3rd only): Clevelond, OH; TB: Bay St.
•	Robins AFB, GA; GKBT: Fort Sam Houston San Anto-		Louis, MS; SB: Toronto, ON
	nio, TX; GKGT: Altus, OK	September 6	SB: Fredricton, NB
May 4-6	SB: Ft Lauderdale, FL TB/GKGT: Ft. Lauderdole, FL; GKHQ: 600 Festival Con-	September 8 September 8-9	TB: Muskogee, OK BA: NAS/JRB Willow Grove, PA; SB: Shearwater, NS;
May 5-6	cord, NC	September 0-7	GKGT: Smyrna, TN
May 10	SB: Shaw AFB, SC	September 9	TB: Sioux City, IA; GKBT: Colorado Springs, CO; GKBT:
May 12	SB: Sudbury, ON		Kirkland, NM
May 12	TB: Millington, TN	September 11	SB: Stevenville, NF
May 12-13 May 13	GKBT: March ARB, CA; GKGT: Knoxville, TN TB: Ft. Smith, AR	September 13 September 15	SB: Deer Lake, NF GKBT: 100th Airborne Div Lauisville, KY; GKGT: Hous-
May 16	SB: Wiarton, ON	September 13	ton VS USMA
May 18	GKGT: Pentagon Jump	September 15-16	BA: Smyrna, TN; TB: Salinos, CA
May 19	BA: Chorleston AFB, SC	September 16	GKBT: "Motorola 300 CART FedEX Series" St. Lauis,
May 19-20	TB/GKGT: Andrews AFB, MD; SB: Mont Laurier, PQ;	Contember 1/ 17	MO SR. Sault St. Maria ON
May 23	GKBT: "Indy 500 Time Triols" Indionopolis, IN SB: Peterborough, ON	September 16-17 Sept 20-Oct 28	SB: Sault St. Marie, ON TB: Pacific Tour (Specific locations to be announced)
May 23 & 25	BA: US Noval Academy Annopolis, MD	September 22-23	BA: NAS Brunswick, ME; SB/GKBT: NAS Oceana, VA;
May 26-27	BA: NAS Patuxent River, MD; TB/GKBT: Columbio, MO;		GKGT: Elmiro, NY
	SB: Borrie, ON; GKGT: Rondolph AFB, TX	September 26	SB: Wolfville, NS
May 27	GKHQ: Coco-Cola 600 Chorlotte Motor Speedway	September 29	BA: NAS Meridion, MS; GKBT: University of Deloware
May 30	Charlotte, NC TB: US Air Force Acodemy, CO	September 29-30	Dover, DE SB: St. Cotherine's, ON; GKGT: Liberal, KS
June 2-3	BA: Lakehurst, NJ; TB: NAS Follon, NV; SB: Ottawa,	October 3	SB: Aspen, CO
	ON; GKBT: Belfield, ND; GKGT: Scott AFB, IL	October 6-7	BA: San Froncisco, CA; SB: Page, AZ; GKGT: Fort Worth,
June 9	TB: Hill Air Force Bose, UT	a =	TX
June 9-10	BA/SB: Quebec City, PQ; GKBT: Grantsville, UT; GKGT:	October 7	GKBT: Laughlin AFB TX
luna 10	Belmont, NY TR. Connen Air Force Rose, NM	October 10 October 13-14	SB: Tucumcari, NM BA/GKBT: MCAS Miromor, CA; SB/GKGT: El Paso, TX
June 10 June 12	TB: Connon Air Force Bose, NM SB: Kingston, ON	October 20-21	BA: Alliance Field Fort Worth, TX; GKBT: Moody AFB,
June 14	SB: Elliat Lake, ON; GKBT: San Diego Padres Game,		GA; GKGT: Langley AFB, VA
	CA; GKGT: NY Yonkees Gome, NYC	October 27-28	BA: Lafayette, LA; GKBT: Kings Park, NY; GKGT: New
June 16-17	BA: Syrocuse, NY, TB: McChord AFB, WA; SB:	Al A	Orleans, LA
	Homilton, ON; GKBT: McConnell AFB, KS; GKGT: Wil-	November 3	TB: Seymour-Johnson AFB, NC RA/GVRT, Locksonville Reach, FL: GVGT, Veesler AFR.
June 20	low Grove, PA SB: Leamington, ON	November 3-4	BA/GKBT: Jocksonville Beach, FL; GKGT: Keesler AFB- Biloxi, MS
June 22-24	SB: London, ON	November 4	TB: Moody AFB, GA
June 23-24	BA: Dovenport, IA; TB: Tullohomo, TN; GKBT: McChord	November 7	GKBT: FT Brogg Saftey Foir, NC
_	AFB, WA; GKGT: Von Nuys, CA	November 9-10	BA: NAS Pensacola, FL
June 27	SB: Amprior, ON	November 10-11	TB: Daytona Beach, FL; GKGT: Columbio, SC
June 29-30	SB: St Hubert, PQ TB: Scott AFB, IL; GKGT: Ft Drum NY	November 16-18	GKBT/GKGT: "Block and Gold Parachute Competition" Roeford, NC
June 30	ID. SCOT ALD, IC, ORDER IT DIGHT IN		noutory, its

w9wi@w9wi.com

Stamp Collecting and DX

suppose these two hobbies don't seem to have a whole lot in common these days, unless you collect the stamps used on your verification letters. But, back in the 1920s many DXers did collect a special type of stamp.

AM broadcast DXing was a very popular pastime in the 20s. Many larger cities had only a handful of stations. Smaller cities often had none at all. If you wanted variety in programming, you had to look for out-of-town stations.

The EKKO Company of Chicago found an opportunity. They began printing stamps to be provided by radio stations when they verified a distant listener's report; and they printed albums for the listeners to collect the stamps in. A co-worker of reader Bruce Rodgers found one of these albums in his grandfathers' effects, and the stamps in it show how both DXing and radio itself have changed in the last 75 years.

The page shown was for stamps from stations in Illinois. You probably can't tell from the small picture, but each space was set aside for a specific station. All the stations on this page were in Chicago except for WCBD, which was located at Zion, Illinois.

Many of the stamps this listener collected were from stations that are still familiar to-day; WBBM, WMAQ, WMBI, WLS. WCFL, WMAQ, and WJJD may not be around to-day, but I'm sure many readers remember them. The WLIB that existed in the 1920s is not connected with the station of the same callsign that exists in New York City today; nor is there any connection between WCBD and the TV station using that callsign in Charleston, SC.

Of course, I'm sure a lot of you will wonder about the very first stamp on this page! KYW is a familiar call to modern DXers in the East, but everyone knows it's in Philadelphia, not Chicago. Few are aware that this famous callsign got its start 680 miles to the east of the Windy City; it moved in 1934.

Bruce suggests it probably wouldn't be possible to do something like this today, and he's probably right. But the EKKO Company did write in the instructions for the stamp al-

bum that they would provide a stamp on behalf of a station if you sent them a copy of your verification; maybe some enterprising DXer sees a new opportunity?



These "EKKO" verification stamps from Illinois stations were collected by a DXer in the late 1920s.

LPFM News

There's big news in the LPFM department this month. Just before Christmas, a modified version of the Oxley anti-LPFM bill passed Congress as a rider on a budget bill, and President Clinton signed it. (Clinton was opposed to the anti-LPFM legislation but apparently felt the rest of the bill was important enough to sign.) The act prohibits the FCC from relaxing protection for stations 0.6 MHz away from full-license stations, and it prohibits the FCC from allowing former pirate station operators to operate LPFMs.

While this legislation will severely restrict the number of LPFM stations that are possible, it doesn't eliminate LPFM en-

tirely. A few days later, the FCC released a list of 255 applicants whose facilities could be granted under the new law, and which were not mutually-exclusive with any other LPFM applicants. People or entities objecting to the proposed stations had until January 22 to file petitions to deny; it is likely that by the time you read this, some LPFM permits will have been granted and some stations will be on the air. See http://www.fcc.gov/Bureaus/Mass_Media/Public_Notices/FM_Windows/pnmm0084.html for more information including a list of applicants.

New Stations

There are also some new stations this month. On the expanded AM band, KWHN-1320 Fort Smith, Arkansas, has moved to 1650 kHz. They're simulcasting their 1320 kHz facility, which has switched callsigns to KWYN. The format is news/talk. Not too far away in Atlanta, Texas, the only full-power station to be authorized on 1610 kHz is on the air. KALT is carrying right-wing talk programming and Fox Sports. Both new stations have been widely heard.

In Canada, two long-silent frequencies have returned to the air. Sheldon Harvey reports 1220 kHz in Cornwall, Ontario, back on the air. This frequency used to belong to CJSS, which moved to FM some time ago. It's been reincarnated as CJUL, "The Jewel," with a nostalgia format.

Probably more important to the Eastern DXer, the old CBC frequency of 740 kHz in Toronto is back on the air. This is also a nostalgia-formatted station. The station had requested CFPT, but those calls were denied, so they'll use the calls from their old 1250 kHz frequency, CHWO. 1250 is to become religious CJYE. It's probably an aural illusion, but I think this station is considerably stronger here in Tennessee than it was as CBL.

Bits and Pieces

Do you have any interesting DX memorabilia? Write me at Box 98, Brasstown NC 28902-0098, or by email to w9wi@w9wi.com. Good DX!

georgez@nacs.net

USA-Sponsored Clandestine Activity Increasing

ne of former President Bill Clinton's last acts, according to the Washington Post, was to authorize an expansion of USA-financed clandestine broadcasting. Clandestine Radio Watch has already reported the sign-on of "Experimental Radio From the Mediterranean Basin," a pro-Israel and anti-Hizbullah clandestine on 756 kHz. Insiders tell MT that even more clandestine activity is highly likely under President Bush's administration.

Meanwhile, the *Washington Post* reported that some Cuban numbers stations have been confirmed as spy transmissions, with the spies using PCs to decode the messages. 2001 is already an exciting year for unlicensed broadcast listening!

♦ Winter SWL Fest

It's time once again for the Winter SWL Festival in Kulpsville, PA, on March 9-10, 2001. Sponsored by the North American Shortwave Association, this is the world's largest annual family reunion of DXers. At the fourteenth annual Fest, unlicensed broadcast DXing will again be part of the fare. Some *Monitoring Times* columnists will be present in Philadelphia. Why not join us?

If you need Fest information, check http://www.trsc.com/winterfest.html on the web. You can write to them at PO Box 4153, Clifton Park, NY 12065.

What We Are Hearing

MT readers again logged over two dozen stations in a crowded North American pirate band, all between 6940 and 6955 kHz. Your best bet is to tune these frequencies on weekends, two to four hours before or after local sunset.

CKLW- The historic Windsor, Ontario, rocker is long gone on 800 kHz, but it still stimulates

pirate memorials. (None currently)

Eat It Radio- As you might expect from the ID, this one is a parody station. (None)

Ground Zero Radio- They put a lot of work into complex productions of drama, parodies, and music. (Blue Ridge Summit)

Happy Hanukkah- They seem to always return around the holidays; this year was no exception. (Merlin)

KIPM- You know that you have an impact when other pirates parody you. Their long dramas generated a parody by WHYP. (Elkhorn)

KMUD- Best heard on the west coast, they normally feature music. (Belfast)

KRMI- Radio Michigan International's seasonal holiday programs supplemented their normal rock music. (uses KRMI6955@hotmail com e-mail)

NOÉL- Guess which holiday is promoted by this station with the four letter call sign? You're right, and you may already be a winner! (None)

Prime Time Radio- Toronto's new 740 kHz medium wave station got several free pirate relays. ODXA is handling MW reports, but not pirate correspondence. (None)

Radio Alpha Lima- Perhaps the best heard Europirate in North America this year; you can try for them around 6210 and 21890 kHz. (Haageveen)

Radio Azteca- Bram Stoker has produced 40 different shows of DX humor and side-splitting parody. If you log this one, don't touch that dial! (Belfast)

Radio Bingo- Their programming has expanded, with bingo games are now accompanied by humor sketches. (uses radiobingo@chek.com e-mail)

Radio Free Euphoria- Captain Ganja sent in this month's photo, which promotes the Winter SWL Festival. (Belfast)

Radio Free Speech- Bill O. Rights' new AM transmitter sometimes features his own advocacy for individual freedom, but he now relays other stations too. (Belfast)

Radio Neptune- The only active pirate that is named for a planet features rock and comedy from Earth. (Blue Ridge Summit)

Radio Tellus- The Earth Station, a classic pirate, is back with rock after several years of silence. (Providence)

Radio Three- Sal Amoniac's moldy pop/rock oldies are insipid, but his ironic humor adds fun. (None; only verifies loggings in The ACE) RBCN- Radio Bob still airs his own pirate shows, but sometimes he's parodied by impostors. (Lula)

Sycko Radio - Don't be fooled by the spelling of Psycho Radio. They have increased their comedy content, but still use no maildrop. (None)

Take it Easy Radio- They took it easy with comedy as the new year dawned. (Belfast)
Voice of the Angry Bastard-Their shows are mainly rock music, so it's hard to say what

they are mad at. (Belfast)
Voice of the Epileptic Catfish- This extremely rare one
appears only once every five
years. This time the Catfish inhabited the Europirate band
on 6300 kHz. (None)

WDRR- Music dominates their shows with a "Desperate Rock and Roll" slogan. (Belfast) WHYP- James Brownyard remains the most active shortwave pirate, with his signature weather reports and grunting noises. (uses whyp1530@yahoo.com e-mail)

WLS- Montgomery Ward is bankrupt, and Sears' "World's Largest Store" theme no longer rocks on 890 kHz from Chicago. But, pirates keep the memory alive. (None)

WMOE- Their call letters come from the Three Stooges, but the shows are a mix of music and ID's. (uses wmoe6955@yahoo.com e-mail)
Z-Rock- This professionally produced replica of a commercial FM broadcaster is still around. (None)

Reports and QSLs

Reception reports to pirate stations require three first class stamps for USA maildrops or \$2 US to foreign locations. This finances postage for a souvenir QSL to your mailbox. Send your letters to these addresses: PO Box 1, Belfast, NY 14711; PO Box 28413, Providence, RI 02908; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 69, Elkhorn, NE; 68022; PO Box 24, Lula, GA 30554; PO Box 293, Merlin, Ontario N0P 1W0; and PO Box 663 7900ar Hoogeveen, Netherlands. A few pirates, as listed, prefer e-mail, bulletin logs or internet web site reports instead. Reports to the Free Radio Network 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 my e-mail address atop the column. This month we heard from Alfred (Alpha Lima), Hoogeveen, Netherlands, John T. Arthur. Belfast, NY; Lee Banner, Fishkill, NY; Jerry Berg, Lexington, MA; Ranier Brandt, Hoefer, Germany; Jerry Coatsworth, Merlin, Ontario; Ross Comeau, Andover, MA; Joe Filipkowski, Providence, RI; Harold Frodge, Midland, MI; Captain Ganja, Belfast, NY; Pete Greene, Cleveland, OH; William T. Hassig, Mt. Prospect, IL; Vince Havrilko, Beale AFB, CA; Hans Johnson, AZ; Jim Keeling, St. Charles, MO; Debbie Kinloch, Toronto, Ontario; Chris Lobdell, Stoneham, MA; Ben Loveless, Bloomfield, MI; Greg Majewski, Oakdale, CT; Bill McClintock, Minneapolis, MN; Cachito Marnani, Santiago, Chile; Adrian Peterson, Indianapolis, IN; Mike Prindle, New Suffolk, NY; Lee Reynolds, Lempster, NH; Martin Schoech, Merseburg, Germany: Lee Silvi, Mentor, OH: Bud Stacev, Setsuma, AL; DJ Stevie, Basel, Switzerland; Niel Wolfish, Toronto, Ontario; and Dave Zantow, Janesville, WI.

Can You Hear the Lowfers?

he term "Lowfer" was coined by the late Ken Cornell, W2IMB, during the 1970s. It's shorthand for "Low Frequency Experimental Radio Station" and refers those stations (and operators) frequenting the 160-190 kHz license-free band. The term caught on, and today there are over 70 operators in North America who wear the "Lowfer" badge with honor.

♦ Looking Back

In late 1950s, the FCC established 160-190 kHz as a band where unlicensed operation was permitted under certain restrictions. Chief among them were the requirements to use no more than one watt of input power and an antenna length of no more than 50 feet (including the feedline).

Although the band had been used for intercoms, remote control devices, and other short-range utility applications for some time, it was not until the late 1960s that radio buffs took a serious look at the spectrum.

A few articles on 160-190 kHz appeared in ham and electronic magazines during the late 1960s and early '70s. This sparked interest among a handful of experimenters searching for new challenges. On the East Coast, Ken Cornell (NJ) and a few experimenters in Connecticut and New York were among the first to explore the band. (It may be a surprise to many that this group conducted a three-state, five-way QSO in April of 1972 – a feat considered rare even today!)

Ken Cornell became a leader in the longwave



hobby and went on to publish 10 editions of the Low & Medium Frequency Radio Scrapbook from 1972 to 1997. The book became the standard reference for serious experimenters and is still in demand today. (Sadly, the book has been out of print for several years, and 1 am

not aware of any plans to republish it - K.C.)

Ken Cornell's first book on the 160-190 kHz experimenter's band later became known as the *Low & Medium Frequency Radio Scrapbook*. Ten editions were produced between 1972 and 1997.

◆ Today's Activity

Activity on the 160-190 kHz band (1750 meters) is enjoying new popularity with the creation of new transmitting modes and the hope of an LF ham band (now under consideration

by the FCC)

Standard keyed-carrier CW is the dominant mode for most Lowfer operations. However, you are also likely to find digital modes being used, such as BPSK (Binary Phase Shift Keying) and a mode called QRSS, which is very slow CW (less than 1 wpm) intended for reception by computers.

Computerized modes lend themselves well to unattended monitoring of Lowfer beacons. With the appropriate software, it is now possible to set your computer up to "listen" for a signal through the night or at any time when you're not at the controls. When you return, you can check the results on the screen. For more information on these modes, including links to downloadable software, check the Longwave Club of America (LWCA) web site at www.lwca.org.

Are there Lowfers operating near you? Table 1 lists the North American stations believed to be active at this writing. This information was obtained via the web at www.highnoonfilm.com/xmgr/beacons.htm. Check this site for additional information on Lowfers and updates to the operator's list.

When trying for any of these stations, headphones, a good low-noise antenna, and a narrow filter bandwidth are very helpful. As with any weak signal work, very slow tuning is also recommended. It may take ten minutes or more to do a serious bandscan of 160 to 190 kHz. Happy hunting!

Table 1. Lowfers in North America

IDENT	FREQ.	LOCATION
НПР	160.000	Woles Center, NY
GSD	170.000	Gary, SD
NF	172.400	New Freedom, PA
NUT	174.000	Simi Volley, CA
8TXT	174.600	Sandusky, OH
D	175.000	Des Maines, IA
5FEK	175.000	Bixby, OK
CA	176.000	Cormel, NY
RLD	176.330	Stonfield, NC
NC	177.777	Stanfield, NC
MPK	177.900	Chittenango, NY
ZWI	178,600	Baldwinsville, NY
K3DI	180.000	Arnold, MD
121	181.167	San Gabriel, CA
RL	181.620	Herndon, VA
BRO	182.200	Duluth, MN
UD	182.500	Wokefield, QC
NR	182.516	Riverside, CA
TFQ	182.700	Centertown, KY
A30	182.900	Monroeville, PA
PRK	183.160	Saratoga, CA
3ZIM	183.333	N. Toronto, ON
PLI	183.500	Burbank, CA

ELU	183.500	Simi Valley, CA
ZTM	183.500	Layton, UT
MEL	183.544	San Jose, CA
YWK	184.320	Dollas, GA
RI	184.320	Rifton, NY
JDH	184.500	Bonaire, GA
R	184.877	Durant, OK
KC	185.000	Bloomfield, NY
FAW	185.185	Riverton, UT
WA	185.300	Andover, MA
RED	185.500	Wousa, FL
3SC0	185.900	Scarborough, ON
YK	185.970	Evansville, IN
GW	186.000	Athens, OH
BA	186.375	Lancaster, IL
LEK	186.700	Aitkin, MN
1A	186.713	Marshfield, MA
MS	186.800	Scottsburg, IN
VPMO	186.890	Valley Park, MO
RB	186.920	Freeport, IL
BOB	186.986	Mohomet, IL
M	187.088	Browley, CA
1 LF	187.300	Calera, AL
HM	187.370	Prescott, AZ
DCH	187.352	Berlin, MD
BK	187.450	Shell Lake, WI
YD	187.500	White City, FL
K	187.500	S. Coffeyville, OK
MV	187.600	Little Folls, NY
HDO	187.650	Morro Bay, CA
M00	187.780	Monroeville, NJ
VA	187.800	Smith Mtn. Lake, VA
DJL	188.000	Newbury Pk., CA
YH0	188.150	Moson, OH
QYV	188.570	Donora, PA
GIR	189.200	New Eagle, PA
SAM	189.200	Crystol, MN
ARK	189.300	Leslie, AR
TH	189.360	Calts Neck, NJ
XMGR	189.500	Heleno, AL
LP	189.550	Riviero Beach, MD
IDF	189.600	Idaha Falls, ID
TEXAS	189.700	Haslet, TX
RM	189.800	Duluth, MN
OK	189.950	Davenport, OK

New Catalog Available

Universal Radio, Inc. (http://www.universal-radio.com) is well known to most utility monitors. Over the years they've supported the hobby through a wide variety of books, equipment and innovative accessories – many of which are geared towards longwave and mediumwave reception. Their web site is also an excellent source for tutorial information on all facets of radio monitoring.

Universal recently announced that their 2001 Communications Catalog (#01-01) is ready for shipment. It is available free in North America by fourth class mail and is available outside North America for five International Reply Coupons (IRCs). Contact Universal via their web site, or write them at 6830 Americana Pkwy, Reynoldsburg, Ohio 43068-4113.

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SCANNERS

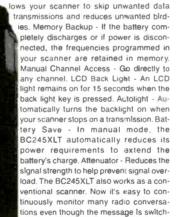
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Going Mobile

e have, as a society, become very busy people. As such, finding time to enjoy the amateur radio hobby can be difficult. However, one place that has always seemed to be a haven for ham radio is the cockpit of an automobile.

Quite a few years ago, I had a twice weekly commute from New Jersey to Washington, D.C.. I had my trusty Drake TR 33C full of crystals (yes, this was in the days before cheap frequency synthesis) to cover all the major repeaters along Route I-95. I could even do a trick at the top of the Delaware Memorial Bridge where I could hit my home repeater while still about an hour out and run an autopatch phone call to my XYL to let her know I was nearing home station.

Some years later I became involved in county hunting, the process of working hams, usually operating mobile, from every county in the United States. This led to my initial experiments with mobile HF operation. Imagine driving a Honda Civic with a Kenwood TS-520, tube final, rig sitting on the passenger seat. I used to have to rev the engine so the rig wouldn't draw the battery down too much on transmit.

As you can see from the above personal anecdotes (and, believe me, there are dozens more), mobile amateur operation can be a lot of fun. It can also include a number of adventures and challenges that really run the fun meter into the red!

We are moving into a truly golden age for mobile operation. Rigs like my old TS-520 that displaced a passenger are now as small as a traditional, under the dash CB radio. A few years ago the hot setup was a dual

band VHF/UHF rig. Now, the major manufacturers are in a design war producing combined HF/VHF/UHF "One Rig Does It All and Brews Coffee Too" transceivers, again with very small form factors.

So if you are not already "mobilized," it's time to get on the stick. Lets have a little talk about getting things set up for good mobile operating.

The Essence of Car

If you ever are wandering around a new or used car lot, you will always be able to spot the ham buying a car. A ham's needs are a little different from your average car buyer. (It's also fun to use these eccentricities to drive the car sales person around the bend.) For example, when I go looking for a car I pop the hood and look to see if the battery is located close to the firewall as opposed to way up front. If the car has its engine mounted "sidewinder" are the plug wires toward the front or the rear of the engine compartment? I check to see if the firewall appears to have a place or two that will allow bringing wires into the driver's compartment without major surgery.

Once I've gotten initiated under the hood I then check out the outside. I look for sturdy "hard points" on the roof, trunk lid and bumpers for mounting antennas. If I really want to get into things, it doesn't hurt to head for the service department and ask if the particular car in question has had any service bulletins concerning RF interference or mobile phone/radio installation. (Note: one of the few good things to come out of cell phone technology is that cars' microprocessor controls tend to be better shielded than they used

to be.) Every ham from the early eighties knows a story of somebody who put a ham rig in a new car and whenever the mike was keyed the windshield wipers turned on, the horn blew or the car's engine died.

But, most folks reading this aren't going to run out and buy a new car just to play radio. These are considerations you may want to have on your checklist if you do go shopping in the future. And I can tell you from experience that you can get a few extra dollars knocked off because "the bumpers just aren't wide enough for a Hustler Ball Mount." You can make almost any vehicle a suitable mobile platform. Some will just take a little more work than others.

♦ Some Power Basics

Okay, let's review that bit about checking around under the hood. If you want to run a mobile rig your first order of business is to get the best, steadiest, cleanest 13.6 volts (the REAL 12 volts) into your driver's compartment that you can. You want to do this with full consideration for safety and minimum interference from (and to) electrical components under the hood and under the dashboard.

Generally, the best way to go is to run a pair of fused wires from your car battery through the firewall to your transceiver. My practice is to use #12 gauge stranded copper with appropriate fusing in both the hot and ground wires. Always check your radio's manual to determine the current handling requirements you may need and adjust the wire size and fuse ratings accordingly.

So how do you actually connect to the battery?! This has become very easy in re-





The new Kenwood TS-2000 is significantly smaller in size than the TS-520 Old Uncle Skip used to go mobiling with.

cent years. Most automotive supply stores now stock battery cables and cable ends specifically designed with "extra" wire attachment points. These are designed for the "high output" audio crowd but we hams can make good use of them as well. Standard practice is red wire for hot and black for ground side. Don't try to skimp and use a single hot wire and then grab ground from some bare metal inside the car. This tends to lead to interference pickup and can make for some bad business if a short occurs. Stick to two fused wires! Protect your rig and your car.

Under the hood, you will want to run the wires so they do not come into contact with any moving parts or run across any hot or abrasive surface. I steer clear of the fuel system as well. Accidental sparks around gasoline could start a fire. An additional consideration is to keep the wires well away from any part of the ignition system or any of a modern car's "black boxes." Remember, these can also be under the dash, so pay a bit of attention there as well.

I usually have good luck tracing wires under the hood to find an existing rubber grommet through the firewall that will usually accommodate an extra couple of hefty wires. If you are not so lucky, before you drill any holes, head for the car/radio store again and buy an appropriate size rubber grommet. Drill a hole to allow for proper placement of the grommet and, by all means, before you drill make sure you will make a clean hole and NOT drill through any wires, parts, fuel lines, etc. (All those things that will make you look really foolish when the tow truck driver arrives, should you goof up too badly.)

Connectors

Okay, so now you have these two wires dangling under your dashboard. Now what?

Most folks prefer some sort of quick release wiring system to allow for easy removal of the radio for servicing or as an anti-theft countermeasure. Over the years 1 have taken up the idea of standardizing my connectors for mobile use. This allows me to plug various radios into my hot connection coming in from the battery. 1 use "Molex" brand connectors rated at 20 Amps. These cover all the gear 1 carry mobile and can be found at most parts suppliers. Radio Shack even stocks them under their own name. There are a number of other suitable connectors as well. Take some time to research the possibilities that are best for you and your application.

Rig Placement

This can be trickier than you think. Modern automobile dashes often have rounded surfaces that can be a bit hard to work with. Further, it is important to know what is going on behind those plastic surfaces. Car manufacturers hide all kinds of wires and parts

under the dash. You will also need to find "hard points" to mount the radio. A good place to look is around ashtrays and existing factory installed radios. These areas usually have enough extra metal to do the trick.

Now you also have to give some thought to the process of operating a radio in a car. For example, I like a standard transmission. If I were to mount the rig in the more traditional center console space, I could end up driving down the road wrapping the mike wire around the steering wheel and gear shift if I wasn't careful.

A couple of years ago I came up with a solution that killed two birds with one stone. I mount my primary 2 meter rig on the *left* side of my driving position. This allows me to operate the radio with my left hand and still grab gears with my right. Ever since I took up this system I have never done the embarrassing "steering wheel wrap" since. Further, shady characters don't tend to look for radios on the left side of the car. I toss a piece of an old black T-shirt over the radio and you can't even see it through the windows. Very cheap anti-theft protection.

Antennas

These new multi-multi-multi-multi band radios have created a land office business for mobile antenna systems. A quick trip through any ham radio accessory catalog will yield dozens of possible choices. I've always found performance and gain figures associated with short vertical mobile radiators to be very speculative. There are just too many practical factors to take into account that could adversely affect antenna performance on the road. So when I make my antenna choices, I give a quick passing glance to gain figures in favor of practical design. In other words, I'll sacrifice a decibel or two in favor of a sturdy, well constructed aerial that is going to mount safely on my car's roof, bumper or trunk lid as the case may be. Some people might also throw in general aesthetics as well. Personally, I always thought a distinctive (weird looking) antenna made my car easier to find in a parking lot.

The only other trick to figure out is getting the transmission line from the antenna to the transceiver. Much of what was discussed in the under the hood section still applies. You will want to keep the wire away from other electrical and fuel lines. You will also want to route it so that it doesn't abrade or kink with normal use. A good place to look on many cars is under the plastic pieces at the base of the car doors. This often avoids lifting the carpets which can be tricky on some newer cars.

There is no one right way to set up a mobile installation.. Cars and people differ widely. However, a safe installation used in a safe manner can make for many miles of amateur radio fun.

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Recapping and Testing the Triplett R.F. Generator

ast month, I emphasized the importance of adding a good r.f. generator to your test instrument "arsenal" and made some suggestions about types you might acquire. Then we concentrated on the one I had picked up to discuss on these pages, a Triplett 2432 manufactured just after World War II for the radio service trade. We popped the front panel, removed the power supply module, and took off the several copper shield covers that were surrounding the other modules making up the unit. I was surprised and pleased by the quality and ruggedness of the construction.

As I always do, I checked out the power transformer early in the game (with the rectifier tube removed to prevent plate and screen voltage from being applied to the circuitry). Transformers can be tough to replace and it's better not to put in a lot of work on a radio or other piece of equipment until you are sure you have a good one! The transformer passed muster, and an inspection of the other circuitry revealed that the unit was clean and free of owner modifications. During that preliminary look, I also discussed the location and function of the main circuit elements.

Circuit Review

At the time, I didn't have a schematic of the circuit to show you. But I've since been able to acquire an owner's manual for the 2432, so I'm reproducing the schematic now for your review. The dotted line represents shielding - either as braid that covers wires or as sheet copper enclosing entire circuit modules. At the upper left of the schematic, you'll see the 6SJ7 tube that does the r.f. generating.

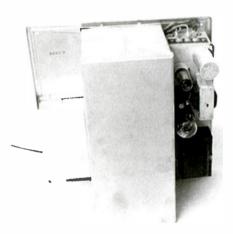
Notice the shielded cable running across the top of the schematic, carrying the r.f. output from the plate of the tube to a shielded enclosure containing a resistor network. The network allows adjustment of the strength of the r.f. signal appearing at output jack J1. The coils and capacitors just to the right of the tube are the tuned circuits that - along with main tuning capacitor C7 - control the generator frequency.

The fixed-frequency audio generator, using a 6J5 tube, is at the lower left. The audio can be impressed on the r.f. carrier, when that is helpful in radio alignment procedures. Or, it is available directly at output jack J2 for use in tracing audio circuits. Finally, the power supply is at lower right. Note the 6X5 rectifier and the OD3/VR150 voltage regulator tube. The latter provides a steady power supply output (at 150 volts) that contributes to a stable output signal.

Cleaning and Recapping

This month's work session began with a

spray of contact cleaner on the working parts of all selector switches and controls - including the sliding contacts that change the coil/capacitor combinations as the main bandswitch is rotated. Then, as is my practice, I methodically replaced the paper capacitors in the unit. Unfortunately, because of the tight wiring interconnecting the various subchassis in the unit, I wasn't able to get at two them - at least not without serious dismantling. But I was able to verify that these two caps showed no leakage whatever even on the highest ohm range (30 megs) on my VOM.



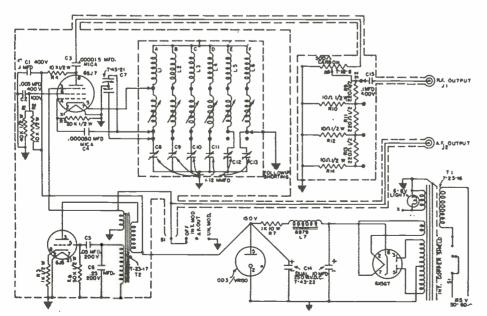
Once the 2432 is buttoned up again, there isn't much to see. The extensive shielding covers everything but the power supply.

I also replaced the two electrolytic caps in the power supply module. During all of this, I definitely made good use of the butt-connector replacement technique that I outlined in last month's column. Of course, the specialized caps in the tuned circuits (C8-C13) were not touched. They are not a type that is subject to deterioration and leakage, and disturbing them in any way would affect the calibration of the unit.

While I had the subchassis units separated, I took advantage of the opportunity to check the values of all the carbon resistors. These do have a habit of drifting (usually increasing) with age, particularly the higher resistance ones. However I didn't observe any of that here. All resistors were silver band (10%) tolerance units and the exhibited values were within this tolerance or not far enough outside to worry about.

Button-Up and Testing

Now it was time to reinstall the power sup-



Triplett 2432 Schematic shows the unit's thorough shielding and simple design.



The 2432 hooked up the Navy "LM" for testing. Headset allows signal from the 2432 to be adjusted to "zero beat" with signal of precise faster and easier to frequency generated internally in "LM."

ply unit and all the shield cans, button everything up, and turn the unit on. In case you hadn't noticed, this is the first time I've applied power since I first purchased the instrument at the flea market. I resist the temptation to turn a set on until I've had a chance to check it over thoroughly and replace all caps. One leaky or shorted capacitor (a distinct possibility in a long-disused instrument) can burn up a power transformer, i.f. transformer, speaker field, or other hard-to-find component.

As a precaution, I hooked up my VOM to measure power supply d.c. output. If it failed to come up to the specified 150 volts in a reasonable time after switching on, I was ready to cut the power. However, nothing of the sort happened. The voltage came up properly and held steady

I first connected the Triplett's output to the antenna terminal of an old Hallicrafters S-40 communications receiver that I keep on the bench. The S-40's frequency range would not hit the lowest band on the 2432 (75 to 22 kHz), but covered one or more suitable test frequencies on all the other bands. I listened to a signal from the high end and the low end of the dial on each band - except for the 225 to 750 kHz range. where I could only hit the high end. The signal everywhere was strong, steady and clear, both in unmodulated and modulated mode. And furthermore (though the dial calibration on the S-40 has never been checked) I picked it up at about the right place on the dial each time.

For a more rigorous calibration test, I brought out my old, but highly accurate, World War II surplus Navy "LM" Frequency meter. Some of you may know this instrument better as the very similar Army BC-221. This unit has provision for accepting an exterior signal (as from the generator under test) and comparing it with an accurately calibrated internally generated signal.

Using the "LM," I spot-checked frequencies at different points on all of the 2432's bands except the top one. Its 25 MHz to 50MHz range was outside the reach of the "LM," which cuts off at 20 MHz. In all cases I found the dial setting of the Triplett instrument to be accurate to a very reasonable tolerance, and felt there was no reason to go into the manufacturer's calibration procedure. I wasn't surprised at how well the tests went, considering the quality construction of this

The Triplett will definitely find a home on my workbench shelf. Up to now (and for years) I've used my "LM" as a service signal generator. But the 2432 is so much set up that from now on the "LM" will be employed only as a

standard for checking the calibration of other instruments.

Reader Input

Among the e-mails received recently from readers are a few that relate to our present projects. In the January column, I recommended Radio Shack as a source of those butt connectors that make small component replacement so easy and neat. However, I hoped that somebody might come up with a more economical source.

Mark (Steubenville, OH) e-mails that Hosfelt Electronics (2700 Sunset Blvd. Steubenville, OH 43952-1158) sells a package of 50 that take AWG 22-16 for \$2.50 or a package of 100 for \$4.50. The part number of this connector is 74-292; larger sizes are also available. Compare to Radio Shack's \$1.49 for 10 each of 22-18 and 14-16 sizes (Cat. No. 64-3036A). Though there will be a shipping charge from Hosfelt, it is nice to be able to purchase in larger quantities and without buying the less desirable larger size.

Mark didn't mention whether the company requires a minimum order. Call Hosfelt at 1-800-524-6464 or 1-888-264-6464 (or fax them at 1-600-524-5414) and ask for a catalogue. Thanks Mark!

This also seems to be a good time to mention an e-mail note I received from reader L.F. Atkinson. He feels that every serious radio restorer should equip himself with a 0-130 volt Variac (or similar) autotransformer feeding an isolation transformer. Of course I've already harped on the great importance from a safety point of view of having an isolation transformer on your bench. With the Variac you can also bring the line voltage up very slowly on a radio you are powering for the first time in your shop.

The gradual powering up of a long-disused (or otherwise questionable) piece of electronic equipment has two benefits: first, you can spot any trouble that might develop (wisps of smoke, etc.) while line voltage is still safely low. Second, the electrolytic caps in the power supply can sometimes be rejuvenated by the slow buildup of voltage. The chemical insulating film that separates the "plates" of an old capacitor may be thinned out, but can be reformed through a slow voltage increase as long as that cap isn't dried out inside. If full line voltage were to be applied immediately, an otherwise savable cap could be destroyed instantly.

When I first started writing restoration articles, I was very high on the slow startup method. And I still think it is a good idea to have a Variac in the shop. In fact, I'm putting together a very nice startup unit along the lines suggested by our reader. It's been on the back burner for a long time, but I'll share it with you when it is done. However, I've come to feel that any radio worth working on is worth recapping. And, since capacitors are still easily available (at least by mail) and inexpensive, I change out all paper and electrolytic caps before applying any power.

Reader Nick Terrence was way ahead of us. In an e-mail received some months ago, he inquired if his Powerstat would also serve as an isolation transformer. Regretfully, the answer is no: the primary and secondary of an autotransformer are not isolated from each other; its output terminals are effectively hard-wired to the a.c. line.

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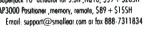
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Antennas Across the Radio Spectrum Part One: The VLF and LF Bands

or most antenna designs the length of the radio waves to be received or transmitted is generally the main factor used to determine the length of the antenna's elements, and of the spacing between those elements. And, as you probably know, the higher the frequency the shorter the wavelength. Thus we see antennas in the VHF, UHF, and microwave bands with elements and spacing quite small as compared to antennas designed for the HF or lower band frequencies. As an extreme example we can find on the LF and VLF bands antennas with element lengths which are measured in miles or kilometers!

This month we start a three-part series which will discuss various antenna designs used for wavelengths from the VLF (3 to 30 kHz) and LF (30 to 300 kHz) bands); next month we'll cover antennas into MF (300 to 3000 kHz) and HF (3 to 30 MHz) bands; and the month after that we'll move on into the VHF (30 to 300 MHz), UHF (300 to 3000 MHz) and microwave (1 GHz and up) regions.

It is of interest to note that some of the

frequencies of the VLF band overlap part of the range of human hearing (20-20,000 Hz, which is .02 to 20 kHz)). In other words, some VLF signals would be audible if they were sound waves rather than radio waves! In fact any alternating current, no matter how low its frequency, is capable of producing electromagnetic radiation (radio waves) in an antenna. Thus there are actually radio frequencies below the range of human hearing, and these lower frequencies can be, and are, utilized for radio communications.

Above the microwave frequencies, electromagnetic radiation occurs as heat, light, x-rays, gamma rays, and cosmic rays. Although there is some similarity in the ways these waves and radio waves behave, we don't utilize radio antenna designs for their radiation or reception.

Wave Propagation and Antenna Design

On the bands we deal with this month we find a variety of radio communication services including foreign broadcasts, aeronautical beacons, maritime radio-location systems, a license-free experimenters band, and maritime communications. With the advent of satellite communication some of these services have become less important.

These frequencies have such long wavelengths that, generally speaking, practical antennas for these bands cannot launch their waves at a distance far enough above the earth to prevent their horizontally-polarized components from being short-circuited into the ground relatively near the antenna. Thus we find that practical antenna designs for these frequencies are vertically polarized. In practical terms this means that the antenna elements responsible for radiating energy are oriented vertically rather than horizontally. Usually these antennas are single radiator, nondirectional designs.

The vertical polarization utilized on these bands can support communication to nearby stations or to any spot on the earth if enough power is utilized in transmitting the signals. In military applications this power is sometimes in the megawatt range. These signals

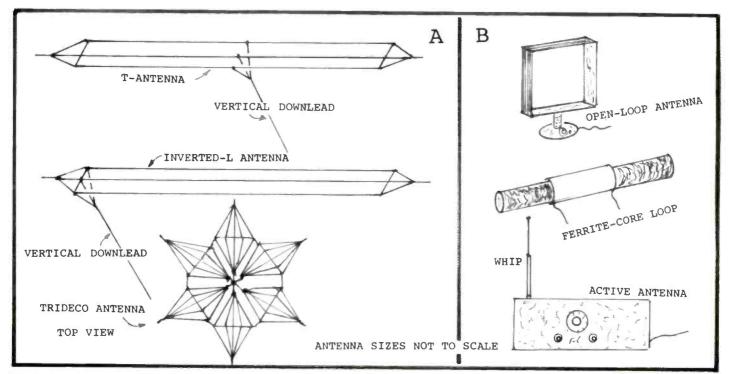


Fig. 1. Some common LF and VLF transmitting antennas (A), and some common LF and VLF receiving antennas (B).

This Month's Interesting Antenna-Related Web site:

http://www.softcom.net/users/kd6dks/antenna.html If you know things like your antenna's feedline loss, gain, and VSWR, this site will tell you things like the actual power into your antenna and the power lost in your feedline. The information on this site is a legacy from Joseph J. Carr, K4IPV, one of the most productive technical writers radio and electronics has known. He is missed by many.

Send in your suggestions for inclusion here as an interesting antenna-related web site to: clemsmall@hotmail.com.

tend to follow the earth's curvature and stay as ground waves rather than becoming sky waves as in the HF band. Thus they can provide worldwide communication at any time of day or night, in any season.

Transmitting Antennas for LF and VLF

Transmitting antennas for these bands routinely require a lot of space - often measured in miles. With such long wavelengths some form of electrical loading is needed to compensate for the fact that it is usually impractical to make the antenna large enough to be very efficient. Capacitive loading in the form of either a grid of straight wires or a somewhat umbrella-shaped configuration of wires at the antenna's top are common. This top loading is found in representative designs such as the trideco, the T, or inverted-L antennas (fig. 1A).

High-Q inductors are often utilized to allow these short antennas to resonate. These inductors are typically protected from the weather in small enclosures called "the doghouse." When the Q of the antenna system excessively restricts the antenna's bandwidth, automatic bandwidth adjustments may be possible by the use of automated saturable reactors.

Receiving Antennas for LF and

As described by the rule of reciprocity, an antenna which performs for transmitting can also be utilized for reception, and vice versa. Nevertheless, we frequently find separate receive-only antennas used for reception at these frequencies. Generally the receiving antenna is a very great deal smaller than the transmitting antenna.

Small antennas are practical because at these lower frequencies received noise is dominant over receiver-generated noise. As long as the antenna element is long enough to receive a usable level of the desired signal, the signal-to-noise ratio (rather than the

amount of signal received) determines quality of reception. Larger antennas which would capture more signal would also capture more noise, and the signal-to-noise ratio would remain essentially the same.

Commonly utilized receiving antenna designs at these lower frequencies are the airwound, or box loops, ferrite loops, and active antennas with either a short wire element, or a short whip element (fig. 1B). Randomlength, long-wire antennas are also utilized.

If the antenna is resonant, its tuning effect can assist the receiver's tuning in limiting the amount of received noise. Loops can generally be tuned to resonate with the desired signal, and they also have nulls in their reception pattern which can reduce noise and interference from specific directions.

The height above ground of the receiving antenna at these frequencies is not usually important, unlike at higher frequencies.

◆ And So

To sum up, transmitting antennas at LF and lower frequencies are usually very large to gigantic, nondirectional affairs, utilizing primarily vertical polarization. Receiving antennas are much smaller, and sometimes allow some directionality via nulls in their reception patterns.

◆ Antenna Contest Coming Up!

Watch this column in upcoming issues of Monitoring Times for announcements of a contest held to find the most unusual antennas in existence! Keep your eyes peeled and your brain alert for antennas that are quite different from the ordinary antennas we see every day in the cities and countryside. We'll have rules and information on entering this contest with your choice for the world's most unusual antenna. We'll report the winner and runner-ups in a future column, and there will be a prize for the winning entry!

RADIO RIDDLES

Last Month:

I said: "OK, so we've worried about radio horizon, radio ground, radiovision, radionics, and radiotrician. Now just what is "radio" anyhow? The answer may not be as simple as you think."

Well, radio as we use it in radio communications is usually thought of as a transmitter sending signals to a receiver where the signal contains some information such as voice, music, video, or digitized data. But less commonly thought-of radio signals include radar signals, ionospheric sounding signals used to determine the state of the ionosphere, and

natural radio signals such as the noisy interference from static or spheric signals transmitted when lightning occurs, whistlers and dawn-chorus signals listened to by the lowfers, and cosmic radiation coming from outer space to be received by the radio telescopes of radio astronomers. Radio has many faces.

This Month:

Enough of this play on the term "radio" OK? Now tell me who invented radio? Hint: This may be a trick question!

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,

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In 2001, Voice Command for Your Receivers

ou know ... each month when I finish a column I think I know the next month's topic. But, in hightech products thirty days is a long time. Yup. It happened again this month. Instead of looking at real-life aviation as planned, we are going apply software from the flight simulation and gaming world to our real-life monitoring.

Computers & Flying

My interest in flight simulators stems from my boyhood and my father's stories of flying the Boeing B-29 Superfortress. Twenty-seven years ago I earned my pilot's license, and it has been in my blood ever since. I dragged my family all over the country in 1979 looking for the first flight simulators for the Apple II. They were very basic and took a lot of imagination.



Figure 1 – Game Commander's Command Setup Screen

These days flying a Pentium computer is all the left seat time I get. But, programs such as Jane's F/A-18 Hornet, Combat Flight Simulator and Microsoft's Flight Simulator 2000 are pretty darn real. Weapon systems, avionics and detailed navigation make flying these things very complex. At times, the keypushing becomes intense.

In an effort to reduce the computer pilot's workload some companies have developed voice recognition command systems. Game Commander 2, by Mindmaker, is a totally software-based voice command system.

Healthy Skepticism

Now just wait a minute. I was as skepti-

cal as you are. I remember a bitter childhood memory when I waited hundreds of years (ok, it was just five weeks, but it felt like years when you're ten years old) for a Lionel Train Commander. The picture on the box showed an engineer speaking into a "microphone." The box promised voice control of your trains. Instead what I got on Christmas morning was a spring loaded diaphragm switch in the form of a microphone. When you spoke into it LOUDLY, your breath pushed open the switch. What a rip! But forty years makes a huge difference, and this Game Commander is for real!

While using Game Commander 2 and doing a roll on take-off in an F/A-18 fighter, I called out "landing gear up ... retract flaps...full throttle." Almost magically, I watched as the aircraft's instruments indicated that these commands had been understood and performed. Then I thought, "Why not Scan ... Edit Frequency and Lockout Frequency?" Could Game Commander be used for voice control of radios?!

What is Game Commander?

The Game Commander recognizes voice commands and translates them into key presses. Game Commander 2 comes on a CD-ROM and requires a Pentium computer with a duplex sound card, running Windows 95, 98 or 2000. A microphone is included with the retail version. That's it. Nothing fancy by today's standards. But Pentiums come in different "sizes." Although I run flight simulators on a 500 MHz Pentium Celeron, my receivers are controlled via a 233 MHz Pentium I.

Installation of the Game Commander could not be easier or quicker. Within two minutes I was ready to try it on the slower 233 MHz computer. A head microphone is provided with the retail version of the program. However, for our application I first used a very inexpensive computer desk microphone that I bought at a flea market for \$2.00. It worked quite well so I then connected the microphone which is internal to my monitor. This worked just as good, while reducing desk clutter.

One thing that really surprised me was that no voice training of the Game Com-

mander is required. Other voice recognition word processing programs I have used in the past (without much success) require a voice training session where the user reads fifteen minutes of Arthur C. Clark's 2010. Although there is a voice training feature on Game Commander, I have not needed to use it. Let's try to control an ICOM R7000 using Game Commander 2 and RadioMax version 5.17.



Figure 2 – Game Commander's Control Box.

The Real Deal or Lionel?

Figure I displays the screen used to define voice commands and associated key presses. Here you can see the "Edit Frequency" command. The "sound like" box is where we have typed in the words that we will speak to make the program press the right keys.

In the lower box, labeled "Actions to send list" I have pressed the RadioMax keystrokes to open the Edit Frequency command: Alt, E and Enter. The user can program up to 256 keystrokes per command. In a similar manner I have set up Scan, Lockout Frequency, Frequency Up, Frequency Down, and a few other commands. Now we are ready to try Game Commander with RadioMax.

First we need to start Game Commander and select the RadioMax command file. See Figure 2. Then we can start RadioMax. Everything looks and acts as it does without

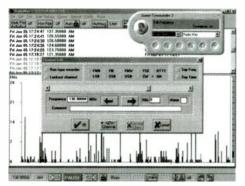


Figure 3 - Working with RadioMax - "Dave ... What Frequency Do You Wish?"

Game Commander. But as soon as we speak the words "Edit Frequency," RadioMax's screen goes to the Edit Channel screen seen in Figure 3. Pretty nifty. Bye-bye bad Lionel flashbacks.

Lazy Technology

I often have my scanner running in my office while I am doing a million other things. It never fails. When I am across the room, with my hands full, something very interesting breaks the searching scanner's squelch. But before I can drop what I am working on, charge across the room and hit the stop scan button, the scanner moves off the channel. Goodbye hot catch!

Well, not anymore. With Game Commander all I have to do is to say "Scan." I have set up the program to toggle the radio between Scan and Pause. Similarly, when the receiver is in the search mode and the scan stops on a source of constant interference, a call of "Lockout Frequency" does the job. Using RadioMax, the frequency with interference is marked for skipping and the search continues. All without me leaving my chair across the room!

Why Not "Channel"?

Some care must be taken in order to make the voice command method work. The distance between the microphone and the receiver's speaker should be maximized. The radio's volume should be kept to a minimum so it does not drown out the voice command.

I also found that the choice of command words make a big difference. When I first set up the command, I used "Channel" for the Edit Channel command. Well, after the edit screen appeared without warning a number of times, I realized the problem. When a station stops transmitting, the squelch tail sometimes makes a "Shuuunel" noise, which sounds too much like "Chuuannel." Using two word commands also reduces the chances of false commands.

Since Game Commander works on key-

strokes, it will not work with point-and-click commands. However, many programs have keystrokes or menu line commands as alternatives to point-and-clicks. Also to maximize command response, on slow computers keep programs running in the background to a minimum.

Is It Really Usable?

In a word ..YES! The scan toggle and lockout voice commands make scanning while working on other projects a very productive and enjoyable experience. Check out Game Commander at http:// www.gamecommander.com. A free trial downloadable version of Game Commander 2 is available at the site. The full version is downloadable for \$29.95. The retail version, including a head microphone, is available for \$39.95.

Over the next few weeks I'll try Game Commander on other receivers and control programs. If the results are as good as with RadioMax we'll share them with you. Game Commander works great with a trusty old 233 MHz Pentium running RadioMax and a R7000. It's like having HAL from 2001, A Space Odyssey, in your shack controlling your receivers.

"Thank you, Dave ... I mean John."



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Mr. Kloss's Perfect Radio: The Henry Kloss **Model One**

he last time you saw the name Henry Kloss in this magazine was my review of the Kloss Model 88 AM/FM radio (MT July '99). At the end of the review I made a few minor comments about the fact that this superb radio, with its digital tuning, remote control, excellent stereo separation and unparalleled audio, could have used a few more station presets and a clock. I happen to enjoy waking up to beautiful music and it was inconvenient not to be able to do so.

Mr. Kloss now introduces a new radio and what do you think he's done? First, he threw out the other speaker. Who cares about stereo anyway when the speakers are less than six inches apart? Next, he threw out the digital tuning, the digital display and the station presets. Then, he got rid of the bass control. Heck, he even dispensed with the remote control! So, here's what you get with the new Kloss Model One: a smaller, monaural, analog tuned, AM/FM radio with the kind of rich audio fidelity you'd hope to find in a stereo system costing four times the Model One's hundred dollar price tag.

Visionary's journey

Kloss got his start as an MIT student in the early '50s at the dawn of the modern broadcast FM radio era. Tinkering with speaker designs and hobnobbing with FM pioneer Edwin Armstrong, Kloss was on a life long journey to perfect FM radio reception. Along the winding road Kloss left a trail of glittering consumer electronics products and the companies that made them, all still revered by audiophiles everywhere. KLH, Acoustic Research, and Advent are among the companies he founded, their storied lines of products evoking fond memories for anyone who has ever sought audio perfection.

The Kloss Model 88, intended as an update on his classic Model 8 from the early '60s, was done with his previous company Cambridge Sound Works. The Model 88 stands as the definitive answer to the Bose Wave radio. Still, Kloss was on his acoustic quest and a few years ago joined Tom DeVesto, former CEO and Head of Research and Development at Cambridge Sound Works who by now had formed Tivoli Audio, for the purpose of promoting Kloss's latest work.

Kloss, clearly a radio listener at heart, sought to build a real listener's radio. Stripped of unnecessary accouterments of contemporary electronic fad, Kloss built a radio to make listening a pleasure. With

The legendary Henry Kloss, an electrical engineering visionary wandering through the last half of the 20th century trailing a glittering string of hi-fi/stereo companies and products unequaled in their performance.



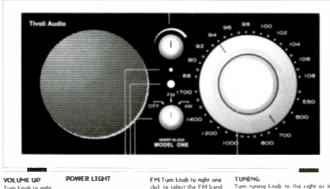


big audio, a small footprint, simple tuning and inexpensive price tag, he believes he got it right. And, he did.

Performance particulars

The first thing you'll notice when you pull this radio from its box is the unusual weight for a table radio this small. Measuring just 4-1/2" high, less than 8-1/2" wide and 5-1/4" deep, it weighs just over 4 pounds. Its heft can be attributed to the massive magnet on its diminutive 2-3/4" speaker, a considerable heat sink for its more than capable amplifier, and its beautifully finished wood veneer cabinet.

The front panel layout features a heart warming retro '60s look with the speaker on the left and the tuning knob on the right, both equally centered. In between are the only other controls: an On/Off/AM/FM switch at the



VOLUME UP Turn knob to right to increase volum

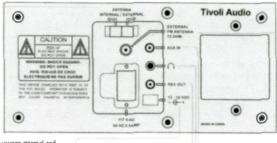
VOLUME DOWN

DOMER LIGHT TUNING INDICATOR

dicks to select the AM band OFF Turn knob to left to turn off the Model

TUNENG change the frequency range. The tuning change the frequency range. The tuning indicator will appear binghrest when best tuning has been achieved. Some weak, but listenable AMI stations will not light tuning indicator and should be tuned for loudest and clearest signal.

Front panel. Elegant simplicity of the symmetrical design on the Henry Kloss Model One is stunning. Features include old fashioned analog tuning, a genuine vernier dial and only two controls: an on/off/AM/FM switch and an actual volume control knob (You remember how to work those, don't you?). (Courtesy Tivoli Audio)



external antennas here

Jse this input to operate the fodel One from a DC power supply.

as a separate tuner by going from the record out to a amplifier. You may also recon in mono by using the output.

Connect a separate headset jack to this connector to listen to the Model One with a headset. Inserting headset will turn off main speaker,

Connect a stereo or mono audio source (like a CD player or a TV)

The Model One comes with built in AMJFM antennas. To improve FM reception, insert the end of the supplied wire antenna into the center of this "F" connector. Adjust the wire for best reception

Rear panel. So little space, so many features. You can do it all from the back: 12v input for RVers and boaters; Rec Out for taping or using the tuner with a bigger amplifier; mini headphone jack; Aux In for adding a personal CD player, external FM antenna jack; and internal/external antenna switch. (Courtesy Tivoli Audio)

bottom and a volume control on the top. Two small LEDs are placed between the two knobs: one a green power light and the other a golden tuning indicator which glows brighter as the station's signal strength is increased while tuning.

This latter is another welcome throwback to tuners of old. Even those too young to remember what it was like to tune an analog tuner will appreciate the quality of the Model One's big tuning knob. To complete the retrolook the FM band is tuned with the top of the dial and the AM at the bottom.

Our test

To test this radio I first spend several hours late one evening wandering around the AM band. While the Model One is not billed as a DX radio, I found the tuning a particular advantage for AM DXing. The tight control and deft feel of the 5:1 geared vernier tuning knob made it possible to tune strong signals just 10 kHz apart such as Canada's CKLW and New York's WGY. I quickly logged the venerable old three letter call signs WOR, WLW, WSM, WJR, WSB, WGY, and WBZ. No fewer than seven stations from New York City were heard. This was all done with only the Model One's built-in AM antenna.

But, what really made AM listening a pleasure was the audio treatment these old-timers got from the Model One. Anyone who's ever listened to the modern AM band with a vintage '30s or '40s AM radio always remarks about the depth and wide range response of those old electromagnetic speakers and tube driven amplifiers. The sound is truly duplicated on the AM band with this radio. Chalk another one up for Mr. Kloss.

The next day 1 put the unit to the FM test. With the built-in antenna the receiver performed as expected. This radio comes with a thin 50" wire with a 75 ohm plug attached which is plugged into the FM antenna jack on the back. Throwing the switch on the back from internal to external the unit performed well tuning in FM powerhouse stations within a 60-90 mile radius. Hooked up to the stacked FM yagi array on the roof the Model One performed as well as the digitally agile Bose Wave bringing in stations as far as 140 miles and just .2 MHz away from other big FM broadcasters.

Finally, 1 plugged a portable CD player into the jack on the back of the Model One and played a series of CDs ranging from classical to jazz and rock to mariachi. This little gem filled a 20' x 20' room at full volume without distortion in either the crystalline highs or the amazingly low bass. One of the secrets to its bass success is a tuned bass port which is open at the bottom of the radio. This hard working speaker was pulsing air out of that bass port which could be felt by hand six

inches away.

While it's intriguing to have a high performance sound coming out of a radio this small, it's the size of this radio which makes it extremely practical. You can squeeze it into virtually any space. It's perfect for dorm rooms, small apartments, kitchen shelves, study shelves, living room tables, as a speaker for your computer, in your RV or aboard your yacht.

One last thing

The Model One has one more feature which has nothing to do with performance but everything to do with design. It's available in three color combinations. A cherry wood cabinet is matched with a cobalt blue front panel; the maple cabinet features a hunter green front and the classic walnut cabinet is matched with a beige front panel. It's the kind of finishing touch a master gives his finished work and it's among the features which makes this radio a real collector's item.

I can't find anything bad to say about this radio. I like monaural audio. I love tuning knobs. It's wonderful to have all this amazing sound pouring out of this sweet little radio. I do wish it were made in America (it's made in China). But, that's why it costs so little.

After thoroughly enjoying playing with this radio, I'm forced to speculate on Henry Kloss's next move. My guess is he's working right now on a super hi-fi

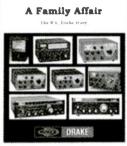
crystal set. 1 hope 1'm right!

♦ To Find Out More

The Kloss Model One retails for \$100 and is available from dozens of high-end hi-fi stores around the country. To find the one nearest you go to the Tivoli Audio web site (http:// www.tivoliaudio.com) and check their dealer list. Many states are unserved with many others having only one or two stores; however, you can buy direct from Tivoli Audio at their web site or by calling 877-297-9479, or by mail at Tivoli Audio, LLC, One Broadway, Cambridge, MA 02142. The Model One comes with a 30 day unconditional guarantee and a one year parts and labor warranty.

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Uniden BC780XLT Trunk Tracker III

e reviewed the Uniden BC9000XLT in March 1995. Its alpha labels, CTCSS decoding, tuning/channel select knob, and wide frequency coverage are major assets.

The number of trunked radio systems has increased steadily since 1995, fueling demand for trunk tracking scanners. Uniden responded with a succession of tracking models, but none of them provides the same flexible step size and mode choices, alpha tags, and wide frequency coverage as the original BC9000XLT.

The new BC780XLT combines the assets of the BC9000XLT with enhanced trunk tracking capability in a downsized cabinet. It is fitted with a DB9 serial port connector and can be controlled or downloaded by a personal computer without using a special level converter.

The BC780XLT includes an additional narrow bandwidth FM mode (NFM), as found in the ICOM IC-R8500. It reduces adjacent channel interference and compensates the audio for signals modulated with lower deviation.

Other improvements include Weather Alert with FIPS code programming, a mute capability, and a beep alert which emits 3 soft beeps at the start and end of transmissions on selected channels or talk group IDs.

Memory

The 500 memory channels are divided into 10 banks of 50. The BC780XLT warns if you try to program a duplicate frequency, though you can override the warning. Channels and banks can be labeled, and both labels are displayed when receiving a conventional signal. Other per-channel parameters include attenuation, tuning step, mode (AM, FM, WFM, NFM), CTCSS and DCS tone squelch, rescan delay, and record enable.

The small, multipurpose VFO/Select knob has a detent action and can be pressed like a key. It can step through the memory channels or vary the frequency, as in the BC9000XLT. The BC780XLT doesn't remember a distinct VFO frequency when changing the knob function between memory channel selector and VFO. A handy repeater offset feature permits you to monitor a repeater input by pressing the VFO/Select knob.

Programming Trunked Systems

Banks may be designated as Motorola Type I or 2, EDACS wide and narrow, or LTR trunked. The Motorola Type 2 category is further subdivided by band. Only one trunked system may be programmed per bank. Programming EDACS and LTR systems is tricky because the frequencies must be programmed in the proper channel

numbers. There's no easy way of knowing the proper order unless you find out from someone familiar with the system or devise the sequence through experimentation.

Each trunked bank supports up to 10 lists of 10 talk group IDs each. The BC780XLT doesn't warn of duplicate talk group IDs. You can assign a descriptive alphanumeric label to each talk group ID. Talk groups IDs can be saved during a search or directly entered via the keypad without actually listening to the system.



Unlike the PRO-2067 and PRO-92, the BC780XLT represents EDACS talk group 1Ds using the AFS (Agency-Fleet-Subfleet) convention. This affords the flexibility of monitoring related sets of talk groups in the same agency, fleet, or subfleet by specifying just the first few digits they have in common.

An I-Call is a station-to-station conversation not heard by other users. The BC780XLT permits monitoring of I-Calls in Motorola and EDACS systems. You can exclude I-Calls, include I-Calls, or hunt for them.

Scanning and Searching

Rescan parameters may be programmed dif-

ferently for each channel, search bank, and trunked system. The delay may be set at 0, 1, 2, or 4 seconds or an "infinite" setting which terminates the scan when the BC780XLT receives its first signal. Three "ruthless rescan" settings are provided which resume scanning after 2, 5, or 10 seconds, even if the current frequency or talk group is still active.

You can scan combinations of conventional frequency banks and trunked system talk group lists, though there's a brief delay when the BC780XLT starts scanning a trunked bank. Alternatively, you can scan conventional frequencies and search through

trunked systems. You cannot search one trunked system while scanning the talk group lists of another.

After 10 seconds of inactivity during a talk group scan, the BC780XLT hunts for (reacquires) the control channel. We didn't find this to be a minor distraction, nor a problem.

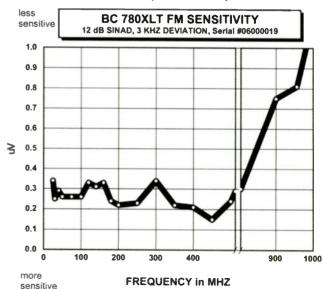
You can program and link up to 10 search ranges, use tone squelch while searching, and lock out up to 200 frequencies during limit searches. A silent Auto Store facility saves active, unique frequencies in one or more memory banks.

Service Search provides 10 banks of factory preprogrammed frequencies and up to 100 lock-outs: rail, air, CB, FRS, special emergency, public safety, news media, TV, ham, and marine.

CTCSS, DCS, and Carrier Squelch

Our BC780XLT's carrier squelch action has too much hysteresis, and about 90 degrees of "play" in the squelch control. Squelch threshold settings vary by band because our scanner's background noise level differs by as much as 7 dB between 40 and 460 MHz using the default modes. The squelch tail is 10 ms long on some signals and longer on others.

The BC780XLT provides both CTCSS and DCS (digital controlled) squelch decoding and display. The CTCSS squelch opens on the proper signal faster than our BC9000XLT, which clips the first part of a transmission. The penalty for using CTCSS is a slower scan speed when skipping over signals without a matching CTCSS tone. The practical scan speed slowed dramati-



cally from 69 channels/sec to 17 channels/sec when our BC780XLT heard, but skipped over a signal without the proper CTCSS.

The CTCSS display feature is sluggish compared to the almost instantaneous PRO-2067 display. Our BC780XLT takes 15 seconds to step through 38 CTCSS tones then listen for a DCS code, looking for a match. The tone finder scheme doesn't work well when transmissions are brief.

Usability and Performance

Our BC780XLT is sensitive - more sensitive in the 860 MHz range than our PRO-2067 (s/n 00315). We found only 15 birdies (fig. 2). It is well behaved on an outdoor antenna, though we hear a few intermod products in the VHF-high band produced by a strong 158.7 MHz pager mixing with a NOAA weather transmitter. Our BC9000XLT receives the same intermod but our ICOM IC-R8500 does not.

The BC780XLT has many more features than keys on its keypad, so you set parameters by navigating an extensive menu system up to four levels deep. Enabling the attenuator or choosing a rescan delay for a channel requires a multi-key

Table 1: Measurements

Uniden BC780XLT Trunk Tracker III s/n 06000019

Grove price \$349.95 Uniden America Corp. 4700 Amon Carter Blvd. Fort Worth, TX 76155 tel. (800)554-3988

Frequency coverage (MHz):

25 - 512, 806 - 956, and 1240 - 1300 (USA version, cell bands blocked)

Step sizes (kHz):

5, 7.5, 10, 12.5, 25, 50, 100, and auto

Modes: AM, NFM, FM, WFM FM modulation acceptance: 13 kHz

Intermediate Frequencies (MHz): 380.7/244, 45/10.7, and 0.45

Image rejection due to 1st IF:

45 dB @ 40 MHz

60 dB @ 15 MHz

67 dB @ 460 MHz

77 dB @ 806 MHz

Attenuator:

5 dB @ 40 MHz 12 dB @ 155 MHz

9 dB @ 460 MHz 20 dB @ 860 MHz

Audio autput power, measured at ext. speaker jack: 2.3 W @ 10% distortion

Tape output audio:

15 dB below ext. speaker audio

Squelch tail length (1uV @155 MHz): 10 ms.

Practical memory scan speed: 69 channels/sec.

Current consumption @ 13.8 VDC off: less than 6 uA scanning (lamps off): 163 mA full volume (lamps off): 242 mA lamps: 100 mA additional

Table 2: BC780XLT Birdies (MHz)

29.7. 50.16. 134.1. 163.8. 245.65. 245.7. 348.95. 349.0. 378.95. 379.0, 806.05, 820.8, 895.5, 925.2, 955.2

sequence instead of a single key press. We found the menu system intuitive and easy to learn. The instruction manual documents the menu in clear, concise diagrams.

Our BC780XLT's audio quality is acceptable, but tinny. We prefer to use an external speaker that can be pointed toward the listener. Two 1/8" jacks on the rear panel are provided for external speaker and reduced level audio output for recording.

The reduced level audio output can be enabled on a per channel and per talk group ID basis. Its level varies with the volume control set-

ting and we measured its voltage at 15 dB below the external speaker output.

The full, lighted keypad is easy to see, but the information packed LCD display uses tiny digits for active banks.

Bottom Line

Except for a fussy squelch, our BC780XLT is an excellent performer - the "top dog" in trunking scanners. It is packed with most of the features a scanner user would want and they are thoughtfully implemented.

The user manual is well written and teaches better than the PRO-2067 manual. Even so, the BC780XLT is an advanced model. An inexperienced consumer may find programming EDACS and LTR trunked systems too challenging.

ADI

AT-600:

Dualband

Handheld

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The cost of a "basic" handhe d radio is under \$200, less than many scanners. Most amateur radios include wideband receive capabilities on par with scanners in addition to the ability to transmit on ham radio frequencies.

HamTest.com is your complete resource for getting your ham radio license. You can study the entire question pools for the new amateur radio license exams, finc an upcoming test location, get help on our message board, or even take a simulated test on-line to check your progress. If you already

have a ham radio license, you can study for an upgrade, or check out cur Restructuring FAQ to see what the new license system means to you!



equipment, including the ADI brand of handheld and mobile radios, as well as a wide variety of microphones, battery packs, and other accessories. Radio transceivers made by PRYME are both affordable and easy to use. Some even come pre-

programmed with popular frequencies, enabling the radio to be used right "out of the box." For information on our quality products see the PRYME web site at:

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Icom's Neat IC-718

hen I was a kid growing up in Ohio, I got a germanium diode radio for Christmas one year. One step up from a "cat's whisker" crystal radio, it had an alligator clip that would attach to a radiator to provide a ground, a socket for a primitive folding rod antenna, an earpiece, and a sliding rod that tuned the stations.

There were no batteries; it was entirely self-powered by the radio waves it received. There wasn't any volume control either — whatever volume from the radio station made it through the earpiece was what you got. But it received AM broadcast stations, and I loved to listen to it under the covers at night when I was supposed to be asleep.

About the same time, my Dad had purchased a wire gizmo that was supposed to boost the quality of our TV reception. It didn't

do anything for the TV, but one night I tried it with my little germanium diode rig. Suddenly, I found myself listening to jazz from New Orleans – from faraway, exotic New Orleans. I was thunderstruck by the idea of long-range radio.

Even better (I was to discover as an adult when I got my ham license) is the idea of long-range two-way radio. The notion that I can talk into a microphone in upstate New

York and carry on a conversation with someone in Florida, or Colorado, or New Zealand is simply magic.

Easy Access to the Ham Bands

I was reminded of this dramatically when I began testing the Icom IC-718, an HF allband transceiver. This diminutive rig measures just 9.5 inches wide, 3.75 inches high, and 9.5 inches deep, barely bigger than the manual antenna tuner that I parked it on. The IC-718 tips the scales at 8 pounds six ounces.

Among the goodies offered by the IC-718 are 0.03-29.999999 MHz frequency coverage, USB, LSB, CW, RTTY (FSK), and AM modes, adjustable transmit power (5-100 watts, SSB, CW, RTTY; 2-40 watts AM), ad-

justable noise blanker, RF attenuator, preamplifier, 101 memory channels, voice-activated transmit, microphone compressor, built-in CW keyer, and a variety of scanning functions. That seems like a lot for a radio with a street price on the sunny side of \$800. About the only significant omission for the radio that includes a CW keyer is a CW filter. Only a sideband filter is provided.

If you want more goodies, you can order them a la carte, including additional filters (CW and sideband), a choice of automatic antenna tuners, digital signal processor, voice synthesizer, desk microphones, DC power supply, linear amplifier, and more.

At the upper left corner of the rig, there's a front-firing speaker – small, to be sure, but it beats the heck out of the larger top-firing speakers found on so many ham transceivers. Below the speaker are jacks for headphones

body of knob. You can spin this beauty until the cows come home and never raise a blister. Above the tuning knob are buttons for controlling mode, filter selection, and tuning step.

To the right of the tuning knob is a bank

of buttons, divided into three sections, for direct frequency entry, memory functions, noise blanker, compressor, preamp, antenna tuner (if you have this option), as well as VFO selection and a variety of other functions.

On the back of the IC-718, you'll find the jacks and sockets you would expect: antenna, DC power, automatic antenna tuner control, personal computer connection, external speaker, CW paddles, linear amplifier, and so on – some 10 connectors in all.

Putting it to the Test

The IC-718 passed the Elliott Idiot test – I could plug it in and operate most functions without ever looking at the manual.

The performance put a grin on my face. The receiver was quiet and smooth. I called CQ on ten meter sideband and worked a 90-year-old gentleman from England who was vacationing in Florida. My next call yielded a Colorado man my age who is both a physician and an engineer. Involved in a high-tech company, he was driving around stashing waterbottles for his

long-distance run that morning. We enjoyed a 30-minute chat that reminded me of the many pleasures on long-distance rag chewing, and I got compliments on the quality of the audio. Because I am not a CW operator, I did not test the IC-718 in CW mode.

The bottom line: over the years, I've spent enough money on ham radios to finance (by today's standards) an excellent used car, but I've also learned that more money spent, while it often buys more performance, does NOT always mean more operating pleasure. The Icom IC-718, however, delivers a very high FPB (fun per buck) quotient. It offers worthy performance, ease of operation, and buckets of fun at very reasonable cost. For a guy like me, an inveterate Conversation Hunter, it's an excellent radio, and I give it my hearty recommendation.



and the hand microphone that comes with the IC-718.

To the right of the speaker is a backlit amber liquid crystal display that serves as information central for the rig, showing frequency, mode, signal strength, VFO status, and a bunch of other information that would be of interest to the operator. While the display was scarcely gigantic — only a few square inches — it was plenty legible even for my bifocal-assisted, over-50 eyes. Below the display are the power button and two sets of concentric knobs. The leftward set controls volume and RF gain/squelch; the one on the right provides command of receiver incremental tuning. Next to that is a dial lock button.

Slightly to the centerline of the rig is a large dimpled tuning knob that even includes a dimple that rotates independently of the



MFJ-616 Speech Intelligibility Enhancer

by Bob Grove

Like many of us, Martin Jue, the man behind MFJ Enterprises, noticed his hearing becoming less acute with age. While a simple, agile, audio filter could help him distinguish desirable audio from the din of muffled noise on his radios, each ear had its own requirements. Realizing that he wasn't alone with this problem, he went to work designing a filter with separate left/right audio contouring.

Martin further discovered in his research which parts of the audio spectrum are more important to intelligibility than others; these became his rolloff edges for the adjustable filters.

The new MFJ-616 allows left/right amplitude balancing between dual 3-watt amplifiers and can drive external stereo speakers (including computer multimedia units) as well as headphones. A dual input allows selection from two audio sources. The unit is very easy to use, and operates from a 12 VDC source (not supplied). Input impedance is nominally 500 ohms (line



input), and for those with profound hearing loss, there is an internal solder pad allowing headphone audio boost above that normally provided.

Our Test

The all-analog circuit features an equalizer bank of four separate frequency-contouring controls, centered at 300, 600, 1200, and 2400 Hz. Manual experimentation of the controls allows attenuation or boost of up to 12 dB from center (flat) position. This provides de-emphasis of the

low frequencies that constitute a minimum of speech intelligibility, emphasis for those of us with high-frequency loss, and comfort-contouring of the mid frequencies.

While the 616 calls for medium impedance (500 ohm) line input, we found that direct connection to a low-impedance earphone/speaker jack on a receiver or scanner worked just fine. Purists may opt to add an external resistive pad to normalize the load.

A convenient pushbutton bypass switch allows instant comparison of equalization settings to non-compensated signals to determine the effectiveness of the controls.

We found the MFJ-616 Speech Intelligibility Enhancer not only easy to use, but doubly useful: Not only is it quite effective in compensating for hearing loss, but it also optimizes desired audio amidst the din of interference on the noisy radio spectrum.

WRTH 2001 review

by Gayle Van Horn

World Radio TV Handbook has recently released its 55th edition, and as last year it has been met with a mixture of pleasure and consternation by radio hobbyists. The 2001 edition has increased its page count to 656 pages, reportedly as a result of reader feedback and ongoing updates, and in order to address evolving changes within the hobby.

Readers have come to depend upon the WRTH's respected, objective chapter on Receiver Reviews that includes scanners, PC radios, and table-top receivers. Home-brew and antenna enthusiasts will most likely find Antennas and Analysers for the SWL helpful, while

WORLD RADIO TV HANDROCK WRTH IN ORIGINAL PRODUCTION OF STEEL PRODU

George Jacobs' HF Broadcast Reception chapter predicts 2001 will be another good year - with less interference!

Propagation, the number one prerequisite for DX, is featured in a most helpful, *Introduction To Propagation Theory*. If you are confused by the importance

of the ionosphere, troposphere, and radio propagation mechanisms, this is an excellent no-nonsense explanation.

In another chapter, take a tour of BBC's Monitoring Service in Caversham and find out just what has been going on in their listening room for decades.

Unfortunately, many on-going complaints by hobbyists still remain unaddressed, especially concerning the National Radio section. As one DXer commented, "errors reported for years still remain untouched." Aussie's report their medium wave section is a mess, while the Russian section has reportedly improved. U.S. mediumwave coverage also receives a thumbs down from many.

Personally, I continue to find their national and international broadcast sections a time-consuming and unnecessary division for the active DXer. Wouldn't it be more advantageous to arrange both national and international information under each county (sorted by continent), instead of constantly shifting to the back of the book?

Despite reports of errors, typos and the lack of corrected data from DXers, I find WRTH a comprehensive guide for national and international radio broadcasting. WRTH continues to offer the listening world a reference manual that should be on every DXer's bookshelf. You can find it at book stores and dealers such as Grove Enterprises (1-800-438-8155 or write PO Box 98, Brasstown, NC 28902) for \$24.95 (plus \$5.95 shipping from Grove).



What's NEW

Tell them you saw it in Monitoring Times

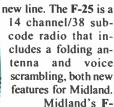
New Products from Midland

Midland announced several new radios at last winter's Consumer Electronics Show. The new SpeakEasy line of FRS radios to be available this summer will be Midland's smallest and lightest to date. They will incorporate the features most asked for according to Midland's customer surveys, including call/paging, accessory jacks and in-unit battery charging.

The new F-10 will be a basic 14 channel unit without codes in a fun egg-shaped case that cradles comfortably in the hand. The F-12 has the same size and shape, but adds 38 CTCSS sub-codes. The F-14 model adds 83 digital sub-codes for a total of

121 sub-codes.
NOAA weather radio reception is featured in the 14 channel, no-code model F-15, and the F-17 trades weather for an FM broadcast radio tuner.

Two more radios with slightly different styling round out the



Midland's F-28 is perhaps the most exciting addi-

tion to their line, since it includes a built-in 400 MHz scanner to pick up race car radio frequencies. Destined to become a must-have item for race fans, the 14 channel/38 sub-code F-28 will feature racing colors and a folding antenna, plus vibrating call alert for easy use at the track

Suggested retail price on the

new line is undetermined at this time. For more information, contact Midland Consumer Radio, Inc. 1670 N. Topping Ave, Kansas City, MO 64120-3865; phone (816) 241-8500; fax (816)-241-5713; or visit Midland's website at http://www.midlandradio.com

DUO-Aria Multi-Format Digital Audio Player

Monitoring Times readers – especially those with internet access – are becoming accustomed to the idea of clicking on a link and being able to listen to music, to a foreign broadcast, to examples of digital communications modes, or even download a

book in audio format. Digisette is a New Jersey company which has devised a simple but ingenious way to make such digital files playable almost anywhere surprising with ease. Their innovative Duo-MP3 and **Duo-Aria** products earned a Best of Show award at the most recent Consumer Electronics Show.

Similar in appearance to the cas-

sette adapters which allow you to play CD audio from a portable CD deck and hear it through your car's audio system using the tape player, the DUO-Aria is all that and more. Like the cassette adapter, it may be inserted into a standard audio cassette player for high fidelity playback of digital audio through your home or car sound system, but it can also act as a stand-alone digital audio player. Just plug in the earphones and slip the slim, aluminumcased "cassette" into a shirt pocket or wear it on your belt for personal listening.

port new audio modes as they become available.

The Duo-Aria has a suggested manufacturer's retail price of \$249; at press time the price through t р www.microwarehouse.com was \$219. If you purchase it through Audible.com you can get the player for \$99, plus a \$9.95 monthly subscription fee. A model with fewer features and less upgradable is the Duo-MP3 player, which is selling for \$169 through http:// www.amazon.com. For more dealer outlets and information, consult the web site at http:// www.digisette.com.

The Duo-Aria contains 32 megabytes of flash memory, which is expandable via an optional 96MB MultiMediaCard. The included Ni-MH battery will play 6 hours on a charge, and can be charged using the included 110 V charger or while playing in the car via the DC charger. The Duo-Aria requires a USB port to connect to your computer; the other model, the Duo-MP3, uses an 18-pin parallel port.

What do you listen to? You can download digital audio downloaded from the internet, you can digitize music from your own CDs and customize your own playlist using the provided RealJukebox software, or you can listen to more than 18,000 titles of Internet-delivered spoken word audio (audiobooks, audio digests of major newspapers, magazines and much more) available from Audible.comTM, for example. The Duo-Aria may be upgraded to sup-



FROM KLINGENFUSS PUBLICATIONS

Certainly the most prolific, and arguably the most reliable shortwave utility databases are these, massively updated each year by the quintessential shortwave expert, Joerg Klingenfuss. Let's take a look at some of his most popular offerings for 2001.

2001 Shortwave Frequency Guide

Combining more than 20,000 entries from both broadcasting and utilities, this massive, 556 page book is an exhaustive reference for the dedicated shortwave listener. Primary sort is by frequency.

For utilities listeners, the frequencies, call signs, modes, locations, and even associated duplex or two-frequency simplex frequencies are given as appropriate for every entry.

For the international broadcast devotee, listings include frequencies, station names, locations, languages, target areas, and schedule times. Listings are cross-referenced by frequency and broadcasting organization.

Excellent informative chapters are included to explain modes, abbreviations, and system details used around the world.

\$34.95 plus shipping from Grove Enterprises and other *MT* advertisers

Guide To Utility Radio Stations

This best seller is now up to 612 pages to hold nearly 11,000 frequencies between 3 and 30 MHz used by aeronautical, maritime, military, government, UN, law enforcement, Red Cross, diplomatic services, and more.

Organized by ascending frequency, listings include call sign, agency, location, mode, associated frequencies, and schedules if known. Cross-referenced by country of origin, then service.

As always, Klingenfuss includes a comprehensive collection of useful information and screen shots, such as NAVTEX schedules, International call signs, NATO routing indicators, commonlyencountered abbreviations, Q and Z codes heard on CW and digital modes, as well as standard lists of emissions designators, station classes, and even official aeronautical and maritime band plans with folding charts.

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Guide To Worldwide Weather Services

Not only radio sources on meteorological information like Navtex, radiofax, and radiotelex, but the Internet as well are in this compendium. This worldwide directory provides hundreds of on-air and on-line sources for up-to-date satellite photos, weather maps, crop calendars, jet stream velocities, long-term forecasts, ozone warnings, surf reports, hurricane and cyclone tracks, ultraviolet radiation, and more.

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Super Frequency List On CD-Rom

If you like to access your data from your computer, this combination international broadcast and shortwave utility database is the answer. It requires a PC with Windows - that's it.

Browse or search for frequencies, countries of origin, station by name or call sign, even time schedules. Essentially, this is the popular Shortwave Frequency Guide on a CD.

Hundreds of good screen shots are included to assist in identification of unknowns, as well as the Radioraft digital-data-decoding shareware program.

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Amateur Radio **Explained**

by Ian Poole

Ian Poole has written a number of articles for Monitoring Times as well as numerous books in the amateur and electronics fields. His most recent book is geared toward the person who is just discovering amateur radio. For anyone trying to explain what amateur radio is all about to a spouse, friend, or group, this book will help.

Following the success of Poole's book, Amateur Radio for Beginners, this new volume covers information about what can be heard, the practical aspects of how to set up a station, techniques to use to hear stations from far away, the codes and jargon that are used, frequencies and frequency bands, receivers, and much more. The book is written in a way which the newcomer can

Amateur Radio explained

understand, and it gives the vital information necessary to get started, especially if the reader lives in the UK.

Amateur Radio Explained ISBN 1-872309-70-4 is a paperback book, 146 pages, published by the Radio Society of Great Britain. It is available

for £9.99 from RSGB Headquarters, Lambda House, Cranborne Road, Potters Bar, Hertfordshire, EN6 3JE; +44 (0)1707 660888; sales@rsgb.org.uk. It can also be found at www.amazon.co.uk

Grundig Satellit

By Thomas Baier

Fans of the Grundig Satellit radio and flea market addicts will want to get a copy of Grundig Satellite - All Models in Word and Pictures. In 126 pages and 120 pictures all the details are documented in black and white for each model of this famous series from 1964 to 2000.

The 5-3/4 by 8-inch format book is available in the U.S. from Universal Radio Inc. 6830 Americana Pkway, Reynoldsburg, OH 43068; 800-431-3939: http://www.universalradio.com

New Australian RADIOMAG

Bob Padula sends news of a new monthly independent Australian commercial radio publication titled RADIOMAG, edited and published by Chris Edmondson, former editor of Radio and Communications magazine.

RADIOMAG will have a team of expert, experienced staff writers. Bob Padula will manage a department titled "Broadcast Monitor," covering shortwave, mediumwave, and FM, as well as other articles related to new equipment, antennas, book reviews, DX peditions, propagation, and information of interest to new listeners. Other columns will cover the gamut from satellite monitoring to the internet (Tom Sundstrom).

General information about RADIOMAG is available from Chris Edmondson, VK3CE, Publisher and Editor, Box 123, Eagle Heights, Queensland 4271; 07 5545 0666 phone, 07 5545 0622 facsimile; Web page: http:// www.radiomag.com. A 12-month subscription (A\$64.80 or about U\$36) is currently being offered at an introductory A\$44.80 (about US\$25), but this may be domestic only. International first class delivery is around US\$52.80.

Caveat Emptor

Monitoring Times has received reports of two persons who ordered but did not receive a product mentioned in the November 2000 What's New. The Cellular Phone Alert Pen was advertised in a flyer forwarded to MT by one of our readers. It was supposedly available from Preferred Customers Guild, which had a P.O. Box in Central Islip, NY. These customers were unable to contact the company or find any proof of its existence. We'll never know if the product was bogus, but Preferred Customers Guild and their money-back guarantee certainly seem to be!

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 mteditor@grove-ent.com.

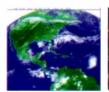




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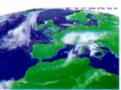


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"You and the MT staff that put this project together have done a FANTASTIC job. You would seem to be the leaders in the field presenting material in this manner so it can be archived so easily. This is the way to receive a magazine."

- Don Nauer

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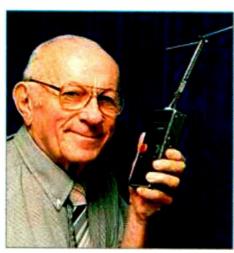




In Tribute

The world of radio communications has lost three prominent citizens in rapid succession; their contributions are immeasurable. The first loss is mourned particularly by his professional colleagues, and the other two by the hobbyists.

Al Gross, licensed as W8PAL since 1934 at the age of 16, never slowed down. In 1938, the year I was born in Cleveland, Ohio, Al was in a Cleveland high school where he combined a simple transmitter and receiver into one portable box; he called it the "walkie-talkie."



His simple invention caught the eye of the Office of Strategic Services (OSS), the forerunner of the CIA, and it was rapidly adapted to a legion of devices used in World War II, including the milk-carton-shaped BC611, featured in every war movie.

His invention of the metal detector for treasure hunters and industrial pipe location was focused by the military into the pieshaped-head SCR625 mine detector. Years later, when I was developing metal detectors to sell, Al volunteered to test them, often sending recommendations for improvements.

Following WWII, Al founded his own two-way-radio manufacturing company, eventually naming it "Citizens Radio Corporation"; yes, that's right – Al was the father of Citizens Band Radio!

Al's fascination with communications led him to patent dozens of innovative products, some of which became the cellular telephone and the pager. Unfortunately, his pat-

ents were so early that the industries evolved after the patents expired, so he never earned the royalties to which he could have been entitled.

But the potential of his genius was caught by one visionary cartoonist, Chester Gould. With Al's permission, Dick Tracy now had a wristwatch radio!

His list of recognitions and awards is astounding, including the Radio Club of America Fred B. Link Award, the Marconi Memorial Gold Medal of Achievement, the Veteran Wireless Operators Association Award, the IEEE Edwin Howard Armstrong Achievement Award, the Lemelson-MIT Lifetime Achievement Award, and Ronald Reagan's Presidential Commendation in Telecommunications.

Al's talents have been utilized by many major players in the communications industry, including GTE, Sperry, Westinghouse, and most recently, Orbital Sciences Corporation. This renaissance man passed away on December 21, 2000, in Sun City, Arizona, at the age of 82. He is sorely missed.

Joe Carr, K4IPV, represented the admirable combination of modesty and productivity. This unassuming man's books and articles have appeared in untold numbers over several decades, appealing primarily to hams and shortwave listeners. Most of us remember him for his popular publications on antennas and simple circuits.

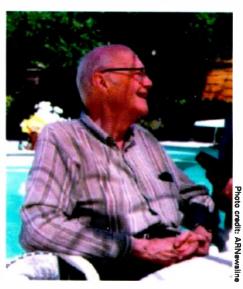
Joe's byline has appeared in numerous publications including MT, Popular Communications, 73, QST, Nuts and Volts, and Popular Electronics. Besides thousands of technical articles, he wrote more than 100 books, including Joe Carr's Loop Antenna Handbook, Practical Antenna Handbook, Receiving Antenna Handbook, Radioscience Observing, and Practical Radio Frequency Test & Measurement.

But he wasn't narrowly focused in his interests. He championed young people's interest in science as a judge in northern Virginia's numerous science fairs, and, according to fellow publisher Harry Helms, Joe's own interests were broad, extending into diverse fields of interest like genealogy, world politics, and biomedicine.

Joe passed away at home in his sleep in Annandale, Virginia, November 25, 2000. He was 57. He, too, will be sorely missed.

Bill Orr, W6SAI, of Menlo Park, California, also died in his sleep January 24th at the age of 81. Bill, too, was a prolific author, with a talent for presenting technical topics in an easy-to-understand manner, especially on antenna subjects.

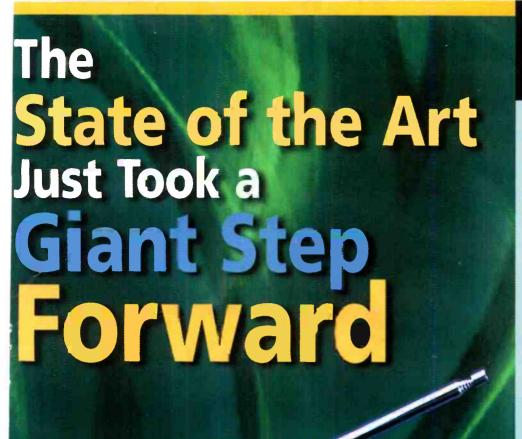
Many of Bill's titles will be well remembered, including his Radio Handbook, The Beam Antenna Handbook, The Quad Antenna Handbook, The VHF-UHF Manual, and The W6SAI HF Antenna Handbook.



Bill was first licensed in 1934, awarded the call sign W2HCE in New York. His W6 call was issued after he moved to California, where he graduated from the University of California during WWII.

Tube-type RF power amplifiers were also a favorite subject of Bill's, and his application notes for EIMAC tubes were well received by both the professional and amateur community.

The recipient of the 1996 Dayton Hamvention Technical Excellence Award, Bill was a frequent project contributor to virtually every amateur radio magazine. His friendly personality, understandable style of writing, authoritative knowledge of his subjects, and volume of works will long endure. But he, too, will be missed.





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