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MONITORING TIMES

A Publication Of Grove Enterprises

RADIO NORWAY

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Beginner's Guide:
Using Your DX-440/ATS 803A

Low-Power DX Targets
on Shortwave

Glenn Hauser, Larry Magne And More

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June 1991

MONITORING TIMES

Radio Norway International

by Jeff Chanowitz **8**

During World War II, Radio Norway's external service was a group of exiles broadcasting into Norway to encourage the resistance movement. But following the war a true external service was incorporated into NRK. Although its English language transmissions have dwindled in recent years, quality programming has not. So this weekend, why not take to the air and visit Norway?

An Inside Look at Looking Glass

by Bill Battles **12**

Underground at Offutt Air Force Base in Nebraska is the command center for the Strategic Air Command. Overhead there is its mirror image -- Looking Glass, until recently, always overhead, always manned, always prepared in case the underground center is rendered inoperative. Occasionally an air show will allow the public to tour an off-duty EC-135, so come along and let Bill Battles give you an inside look.

The All-Continent QRP Game

by Charles Sorrell **16**

QRP Game?! No it's not an earlier version of cowboys and indians called "Quick Running Pilgrims"; QRP refers to low power stations. The idea is to try for the lowest power station you can pick up -- one from each continent -- and then total them up to see how low you can get your score. It used to be relatively easy to achieve a score of 5 kW, says Charles Sorrell, but the clock is ticking; it's getting harder every year.

COVER PHOTO: Night time view of Radio Norway International's curtain antennas at Sveio, transmitting to North America.

And More . . .

What's the trick to using frequency counters to snag an unknown frequency? Well, says Bob Kay, you can't do it from your favorite chair any more than you can play pro baseball from bed. To find out how it is done, turn to page 34.

If you're traveling this summer, you may just want to relax your DXing skills and listen to a few of America's powerhouses. Uncle Skip has a few ideas on exercising the AM and FM dial and other enjoyable ways to pursue your radio hobby during the summer months (p.42). If you're looking for a good travel portable, Magne may just have one for you: Sangean's SG-621. See the review on page 88.

Buying a scanner and you don't know which to choose? It's one of the questions Bob Grove gets asked most frequently. On page 90 he outlines the differences between the two most popular hand-held models and three desk-top scanners. If you already have a Realistic PRO-34, you might want to check out the two modifications on page 94.

There's always more in each month's *MT* than we have room to feature. This month you'll find maritime frequencies, plane talk for the HF bands, a peek inside the NSA's headquarters at Fort Meade (don't expect to see much!), flight test frequencies for hyper-sonic aircraft, how to fight city hall when you want to erect that satellite dish, and much more.

DEPARTMENTS

MONITORING TIMES

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STAFF

Publisher
Bob Grove, WA4PYQ
Managing Editor
Larry Miller
Associate Editor
Rachel Baughn
Editorial Assistant
Beverly Berrong
Subscriber Services
Chanel Hilliard
Typist
Elsa Kerschner
Advertising
Beth Leinbach [704-389-4007]
Dealerships
Judy Grove

EDITORIAL STAFF

Frequency Manager Greg Jordan
Program Manager Kannon Shanmugam
Program Monitors John Carson, Jim Frimmel
Reading RTTY Jack Albert,WA9FVP
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LETTERS

Our CKLW reminiscence in the April issue of *MT* brought back pleasant memories for a couple of our readers who wrote in. John Garrison of El Paso, Texas -- a long way from Detroit, Michigan -- says the story has special meaning for him because of a Zenith floor model radio in his possession.

Three push buttons gave this advanced radio an "automatic" mode; one button was unassigned, one was set for WWJ, and the other brought up CKLW. John says the radio still works well and has three bands from 55 kHz to 18 MHz. What comes up if you punch the CKLW button, John?

Jeff Jacobsen of Austell, Georgia, relived the days of CKLW with great pleasure, since he grew up around Harrow, Ontario, where the transmitter was located.

He adds, "One thing the author failed to mention is that CKLW was the only radio station that a driver could pick up while traveling under the Detroit river. Upon entering the Detroit/Windsor tunnel, a large sign announced the fact that CKLW could be received in the tunnel (probably using a RF cable?). CKLW, in its heyday had all the bases covered -- that's for sure!"

So much for "modern" advances.

April's article on tuning into train communications also caught Jeff's fancy. From his Georgia home he says, "I live only a mile from the Norfolk-Southern double track mainline, heading west from Atlanta. The 'end-of-train' device has proven to be a great help in determining train activity with its regular 'beeps.' N-S uses 161.115 for their EDT's. Maybe someone knows what CSX, Conrail and the Santa Fe use?"

"There are those who have criticized Bob Grove for over-reacting on the subject of the FCC's inquiry into the feasibility of removing Public Safety coverage of scanners and amateur transceivers," says William Haskins of registered monitoring station KMA-1HW in Dennisport, Massachusetts. "Isn't it better to overreact than be forced to look back on the good old days when we were allowed to monitor public safety laws? Whatever happened to the days when law enforcement welcomed a well-informed public?"

Says James Roble, Jr, N3BRS, "We in Cranberry Township are not ashamed of what we are saying on our radios." James is Emergency Management Agency Coordinator in Zelienople, Pennsylvania. "I believe it is essential to emergency preparedness and hazard mitigation that our amateur radio community along with the citizens at large monitor our public safety frequencies in the best interest of public safety."

Especially during emergeny conditions, such as an evacuation, this enlightened public servant believes it is in the best interests of the public to be kept informed, even if it means monitoring communications from his command post to public service personnel. And what would restricting public service frequencies mean for all the volunteer firemen, ambulance, auxiliary police, etc? asks James. "We desperately need these people. Without volunteers, take a guess at the amount of taxes we would be paying to support these services."

Often we *do* pay those taxes, and in the opinion of William Haskins (to get back to our original writer), "it is not only our right to monitor these communications but it is our duty. Let's not forget who is paying for these services in the first place. The First Amendment guarantees our right to free speech, but that right is meaningless if we don't have the right to listen as well."

Freedom to listen can also increase appreciation for our public services; Says Russ Hanam of Oakham, Massachusetts, "I never knew how many times the State Cops helped people with auto breakdowns until I used my scanner."

James Roble also remarked that when the FCC could not control citizens band radio, they gave up. The recent FCC crackdowns on CB offenders, however, has created some anxiety for some CBers, such as one reader who wishes to be identified only as "Magnum."

Magnum says the sidebar story in the April issue from one CB outbander, could have been his story, and

[Please turn to p.100]

COMMUNICATIONS

WISC-TV: Death From Above

Spring brings both good and bad news to residents of Madison, Wisconsin's southwest side. The good news is, of course, the warmer weather, the flowers and the promise of more pleasant times.

The bad news is that as soon as the temperature climbs above 32 degrees, pieces of ice -- some the size of 2-liter soda bottles -- blow from the top of WISC-TV's 1,105 foot tower and crash into neighbor's yards. Smaller chunks have broken windshields, dented cars and forced frightened neighborhood children to stay indoors.

Larger chunks, one the size of a Volkswagen, crashed through the roof of the small building next to the tower. Other times, 6 foot spears of ice fall through the air, burying themselves two to three feet into the ground.

"It's very dangerous," says resident Janice Volden in a cosmic understatement. Christine Fischer, who also lives nearby, says that the falling ice "makes the whole house shake; the pictures rattle."

So far, the station, city officials, and residents have been unable to find a solution to the problem. But for now, spring is over. And once again, the people who live in the shadow of the WISC-TV tower can feel safe -- for now.

A Bullet to the Heart

Piracy of signals from cable TV companies is always a problem but one company, American Cablevision of New York, found a way to not only put the finger on people who were stealing services but also get them to turn themselves in -- all within 24 hours.

According to reports, the cable company fired an electronic impulse called a "bullet" through their system to more than 90,000 subscribers. If the cable box was legally connected, said the report, nothing happened. If there was any theft of service, the box blew out. Over 300 boxes blew out.

People who then called for cable repairs were identified as cable thieves via an "electronic footprint" left on the box. "That's right," said company president Barry Rosenblum, "they turned themselves in. Most called within 24 hours."

American Cablevision filed 317 lawsuits in federal court. Defendants were offered a deal: a $500 cash settlement with the cable company or possible prosecution and fine ranging from $1,000 to $110,000.

Radio Pioneer Dies

When Tobe Deutschmann decided to get into business shortly after World War I, he chose to import cornstalk brooms from Italy. Unfortunately, when he got to Boston with his merchandise, the U.S. Department of agriculture ruled that the brooms had to be fumigated to prevent the spread of European Corn Worms. The fumigation was a steam process that warped all the broom handles and put an untimely end to his broom business.

The Italian cornstalk broom business' loss was radio's gain. In the 1930s, Deutschmann invented the Tobe Filterette, a device that eliminated static from radios. World War II proved the value of the invention as the filterette was installed in tanks and jeeps; however, Deutschmann reduced the price of his system and released the patent so other firms could produce the filter and aid the war effort.

Later, the static filter and the manufacture of capacitors earned him a secure place in the electronics business.

All of this would have been of little interest to all but the most scholarly hobbyist except for Mr. Deutschmann's other contribution to radio -- the founding of a company called "Radio Shack."

Tobe Deutschmann died at the age of 94.

CNN Beware: GNN Is On Its Way

The chairman of Japan's state-run broadcasting company has predicted that the NHK will have his proposed round-the-clock international TV news service on the air by the end of the year.

NHK Chairman Keiji Shima says that the Global News Network would require a $1 billion investment from partners in Japan, the United States and Europe, although he declined to identify his prospects. It is known that negotiations are underway with a number of major American and European broadcasters and that contracts would be finalized by summer.

Shima did not say how the service would be delivered but he did indicate that it would be in English, be based in New York, and compete with Cable News Network. Global News Network, however, would strive to provide "a less U.S.-centered view of world events."

Heath Exits Amateur Market

The Heath Company, famous for high quality electronics for over 40 years, has said that it is leaving the amateur radio business to concentrate on the home and self-study marketplace.

A clearance of Heath ham products began last month. Their 2-meter HT, which retailed for $449.95, is now offered for sale at $199.95. Other rigs are going at similar reductions.

Heath, which was bought by Howard Anthony in 1935 for a mere $300.00, developed its famous line of "build--it-yourself" kits as a way of using some of the surplus electronic parts flooding the post World War II marketplace. In recent years technological advances combined with lower costs of assembled electronics products have reduced the kit-building market. Says the *W5YI Report,* "Heathkit Amateur Radio Equipment 1946-1991: R.I.P."

VOA on Ham Radio?

Michael R. Reynolds, W0KIE, has requested that the FCC amend ham radio regulations to permit the one-way retransmission of live science and space updates from NASA as well as retransmission of Voice of America news on amateur VHF/UHF frequencies.

Not surprisingly, the FCC said no.

The Real Inventor of Radio Is...

Troy Cory says that his grandfather, Nathan B. Stubblefield, a Kentucky farmer, was the real inventor of radio.

COMMUNICATIONS

And to make sure no one disputes the claim, he's hired lawyer Melvin Belli to sue any book publisher who gives credit to anyone else.

In a news conference held on his Pasadena estate, Cory said that "Melvin Belli will put publishing houses throughout the world on notice that, if they do not recognize Stubblefield as the sole inventor of radio, and recognize the first real demonstration of radio voice broadcasts, suit will be brought against them."

According to some reports, Stubblefield first demonstrated his invention in his lab in 1892. Ten years later, he demonstrated it to the public in Kentucky in January of 1902 -- two years ahead of Sir John A. Fleming's development of the vacuum tube and five years before Lee de Forest perfected the three-electrode vacuum tube, which earned him credit as "the father of radio."

Stubblefield reportedly traveled to Washington, D.C. where he demonstrated his invention from the steamer Bartholdi, stationed off the Virginia bank of the Potomac River. He was successful in raising $5 million for his wireless Company of America which he saw as a way to replace telephones - never envisioning broadcasting to more than one listener.

Stubblefield eventually had a falling out with his promoters, saying that he wanted nothing to do with the company unless it was "operated as a fair and legitimate business."

"There remains nothing for me to do but to go home," he reportedly lamented.

Stubblefield won a patent on the wireless telephone in 1908 but died in poverty, starving to death in 1928.

Over and Out for Police Radio Prankster

A ham radio operator from Athens, Ohio, has been arrested and charged with sending a bogus "officer in distress" call over local police channels. James A. Haas, 39, was arrested by FBI Special Agents while he was transmitting the message from his van in Prince William County, Virginia, reportedly pinpointed by the FCC.

Haas, a high school phys-ed teacher, is also suspected of making a similar "officer in distress" call in Prince William County in July of 1990 and of other similar incidents that occurred in Ashland, Frankfort, Morehead and Pikeville, Kentucky where police received false reports of car chases and wounded officers. He has been formally charged in only the most recent Prince William County prank call.

Newspaper reports say that Haas even used sound effect tapes to make the calls sound more realistic.

Haas, who is free on a $100,000 personal recognizance bond, could face up to five years in prison and be fined $250,000.

Out of the 800 MHz Closet

Howie Carr is a Boston-based newspaper commentator who writes often on the subject of monitoring cellular car phones. After getting his own scanner to tune in the action, Carr has been able to draw a number of conclusions from 800 MHz monitoring.

First, says Carr, is that "you learn quickly just how bad the economy is." If car phones had a Top 10 list of most-used phrases, says Carr, "'Chapter XI' would be right up there, just behind 'I'm working late.' and... 'He's full of bleep'".

Carr promises to write future columns on what he's heard on the cellular phone frequencies. "Future entries will be entitled, 'Your Cheatin' Heart'... Other topics will include 'Take this Job and Shove It!' and 'Class B controlled Substances: Massachusetts' Last Growth Industry.'"

A Credit to Our Readers

Thanks to all those who sent in news reports from the many publications you receive: too many to acknowledge this month! Your contributions are valued and many readers admit this is one of their favorite columns. So when you see something new or unusual in the world of radio, send it to *MT* and let us communicate the news.

GLOSSARY

Most abbreviations and "radio shorthand" terms will be explained in the article in which they are used, but following is a list of terms and abbreviations you will find frequently in our pages. We hope you will find it useful.

AFB	Air Force Base
AFRES	Air Force Reserve
AM	Amplitude modulation (transmission mode)
AMVER	Automated Merchant Vessel Rescue System
ANARC	Association of North American Radio Clubs
ANG	Air National Guard
ARRL	American Radio Relay League
ARRS	Aerospace Rescue and Recovery Service
ARTCC	Air Route Traffic Control Center
ATC	Air Traffic Control
AWACS	Airborne Warning and Control System
Baud (Bd)	Bits of data per second
BBC	British Broadcasting Corporation
BFO	Beat frequency oscillator (for reception of CW, RTTY, etc.)
CAP	Civil Air Patrol
Comm	Communication
COMSTA	Communications station
CQ	General call to anyone monitoring, inviting reply
CW	Continous wave (Morse code)
DE	(French) "from"... ID or call sign
DOD	Department of Defense
Duplex	Two-way communications using two different frequencies.
DX	CW abbreviation for distance
DXer	One who listens to distant stations
EAM	Emergency action messages
ECPA	Electronic Communications Privacy Act of 1986
FAX	Facsimile
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Administration
FM	Frequency modulation (transmission mode)
GCCS	Global Communications and Control System
GMDSS	Global Maritime Distress and Safety System
HF	High frequency; shortwave (3-30 MHz)
Hz	Hertz: unit of frequency (formerly cycles per second)
ID	Identification
IF	Intermediate frequency
IRC	International Reply Coupon (available from post office)
IRCA	International Radio Club of America
ISB	Independent sideband
ITU	Internatioinal Telecommunications Union
kHz	Kilohertz (1000 hertz)
kW	Kilowatt
LCD	Liquid crystal display
LED	Light emitting diode
LF	Low frequency (30-300 kHz)
LORAN	Long Range Aid to Navigation
LSB	Lower sideband
MARS	Military Affiliate Radio System
MF	Medium frequency; includes standard AM broadcast band (300 kHz-3MHz)
MHz	Megahertz (1,000 kHz)
MOA	Military Operations Area
MUF	Maximum usable frequency
NASA	National Aeronautics and Space Administration
NASWA	North American Shortwave Association
NG	National Guard
NNNN	End of RTTY message
NORAD	North American Aerospace Defense Command
NRC	National Radio Club
Op(s)	Operation(s)
PFC	Prepared form card
QRM	Noise or interference
QSL	Station's verification of a reception report from a listener
RAAF	Royal Australian Air Force
RAF	Royal Air Force
RCMA	Radio Communications Monitoring Association
RTTY	Radioteletype
SAC	Strategic Air Command
SAR	Search and rescue
SASE	Self-addressed stamped envelope
SATCOM	Satellite communications
Simplex	Two-way communication using one frequency
SINPO	A signal-quality rating system (1-5) on each of the following characteristics: strength, interference, noise, propagation, overall quality
SPEEDX	Society to Preserve the Engrossing Enjoyment of DXing
SSB	Single sideband
SW	Shortwave
SWBC	Shortwave broadcast
SWL	Shortwave listener
TAC	Tactical Air Command; tactical
TFC	Traffic (communications)
UHF	Ultra-high frequency (300-3,000 MHz)
USAF	United States Air Force
USB	Upper sideband
USIA	United States Information Agency
USCG	United States Coast Guard
USCGC	United States Coast Guard Cutter
USMC	United States Marine Corps
USN	United States Navy
UTC	Coordinated Universal Time--The time at 0° longitude
Ute	Slang for utilities (2-way comms)
VHF	Very high frequency (30-300 MHz)
VLF	Very low frequency (3-30 kHz)
VOA	Voice of America
VOLMET	(French) "flying weather"
WARC	World Administrative Radio Conference
wpm	Words per minute (usually used w/ Morse or RTTY)
WX	Weather
YL	"Young lady," female operator

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1991 MONITORING TIMES CONVENTION

Friday, October 4

Noon
REGISTRATION

3:00 to 6:30 PM
EXHIBITS OPEN.
TOURS: 911, Airport Tower

6:30 to 6:45PM
WELCOME AND SPEAKER INTRODUCTION

7:00 to 8:00 PM
EVENING SEMINARS

Military Monitoring
with Larry Van Horn and Jack Sullivan

Cellular Surveillance Techniques
with Tom Bernie

QSLing
with Gerry Dexter

8:15 to 9:15 PM

Computers in Radio
with Jim Frimmel

Satellite Monitoring
with Ken Reitz

Construction of a Shortwave Station
Slide Show from WWCR

Saturday, October 5

8:00 to 9:00 AM
REGISTRATION.
TOURS BEGIN: 911, Channel 6 TV Station.
SPECIAL ATTRACTION: Life Star Helicopter

9:00 AM
EXHIBITS OPEN, SEMINARS BEGIN

Utilities Monitoring
with Larry Van Horn

Used Equipment Buying
with Fred Osterman

Beginner's Antennas
with Bob Grove

10:15 to 11:15 AM

Scanning--Back to Basics
with Bob Kay

Shortwave Listening
Staff

Beginner's Utilities
with Larry Van Horn

11:30 to 12:30 PM

Unlicensed Broadcasters
with John Santosuosso

Scanners--Past and Present
with Bob Grove

Beginner's Receivers
with Larry Magne

2:00 to 3:00 PM

Aero Listening
with Jean Baker and Jack Sullivan

VHF/UHF Communication Systems
with Gene Hughes

Beginner's Q & A Forum
with Skip Arey

3:15 to 4:15 PM

Choosing a Shortwave Receiver
with Larry Magne

Electronic Surveillance
with Howard Perry

Beginner's Aircraft
with Jack Sullivan

4:30 to 5:30 PM

Experts Forum
Group Q & A

5:30 to 7:00 PM
SWAP MEET

6:00 PM
EXHIBITS CLOSE

7:00 to 9:00 PM
BANQUET
Guest Speaker,
Larry Magne
Publisher, "Passport to World Band Radio"

9:30 PM
HIDDEN TRANSMITTER HUNT

Sunday, October 6

9:30 to 10:30 AM

Who's on the Radio Spectrum
with Bob Grove

Choosing a Shortwave Receiver
with Larry Magne
(repeat of Sat. 3:15)

Beginning Ham Radio
with Skip Arey

10:45 to 11:45 AM

Utilities Monitoring
with Larry Van Horn
(repeat of Sat. 9:00)

Listening Laws
with Frank Terrenella

12:00 to 1:00 PM

Tips and Techniques
with Bob Grove

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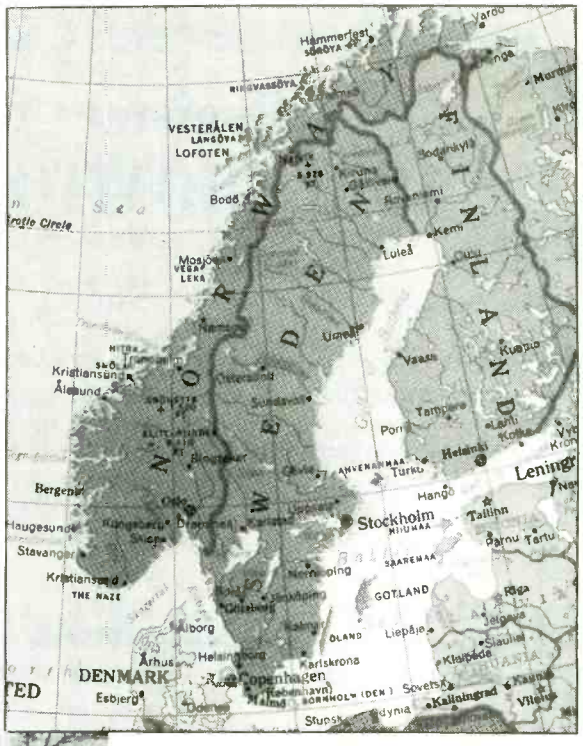
Radio Norway International:

An up and coming broadcaster already at the top of the world.

by Jeff Chanowitz



Arne Bakke Torbjoern Horn Elin Bjoernson Beverly Stephansen
Zena Stoep Kirsten Rund S. Unni Westlund Sverre Fredheim

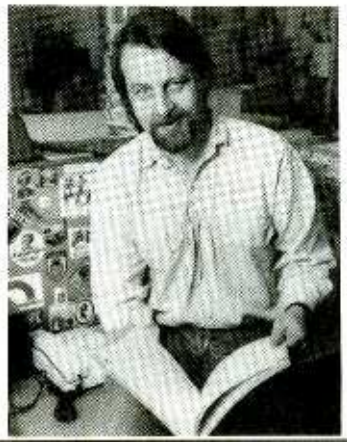
Han Petter Reppe
Else Merete Gustvedt Maria Kommendantvold Elin Waaler

Too often shortwave listeners focus their listening time on major broadcasters or on extremely hard finds. In the shuffle, smaller and more powerful services are overlooked. Such is the case of Radio Norway International, a small station providing quality programming and the latest Norwegian news on a weekly basis.

Located in the Majorstua, which is about five miles from the center of the Norwegian capital Oslo, Radio Norway International's studios and offices are located alongside its parent company -- the Norwegian Radio Corporation. Also known by the acronym NRK, the government owned service oversees the operation of seven regional FM networks, 22 FM stations, one television network, and a mediumwave service. In addition, all of the Radio Norway International's funding is provided by the NRK through license fees paid for by the public.

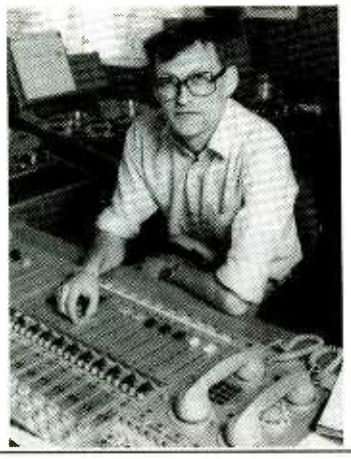
In response to the volatile political situation in Europe during the late 1930s, the Norwegian government formed the NRK. In those days, the domestic service also performed the duties of the international service. All broadcasts from NRK's 5-kW transmitter were on the shortwave band. Each broadcast included a five-minute news bulletin in English, German and French. With Gunnar Nygaard as its first head, the NRK would be responsible for leading Norway through its most difficult years.

On April 9, 1940, as the first act of a coup d'etat, two members of the Norwegian Nazi party stormed the broadcast studios and took control of the NRK. Following intense fighting, employees of the NRK fled north along with King Haakon VIII. On May 17, 1940, Haakon VIII broadcast his famous



Sverre Fredheim, Head of External Broadcasting

The central newsroom (Bakke, Fredheim, and Wilburn)



Chief Engineer Sigmund Wangen

speech to the Norwegian people urging resistance to the Nazi-backed Quisling government.

As the Nazi's took control over all of Norway, employees of the NRK were forced into exile in the United States and Great Britain. In the United States, the NRK broadcast on shortwave to occupied Norway on WRUL in Boston (WWCR-Family Radio today) until the end of the war. In London, the broadcasts were relayed on mediumwave via the BBC. The resistance broadcasts produced by the NRK were so popular that the occupation government was forced to confiscate all radios that were not owned by members of the Nazi party to prevent the Norwegian public from listening.

Following the Nazi defeat in 1947, the Norwegian government authorized the organization of an external service as a separate unit within the NRK. With Gunnar Nygaard as its head, Radio Norway International's 100-kW broadcasts enjoyed a brief period of prominence. The peak arrived in 1952, when Radio Norway International broadcast in English twenty-four hours a day during the Olympic Games in Oslo.

In the 1960s, Radio Norway International underwent a gradual change. Following Nygaard's retirement, Erling Thokle was appointed as the new head. In addition, with other European services signing on the air with more powerful transmissions and with Radio Norway International prohibited from upgrading its transmitters at Fredrikstad due to environmental restrictions, a weekly half-hour of English language programming continued; however, in the U.S., the audience for Radio Norway's broadcasts were limited to ardent DXers who could find the weak signal.

After years of lobbying, in the 1970's the Norwegian government approved the construction of new transmitter sites in Kvitsoy and Sveio. Currently, Radio Norway's transmission facilities consist of one 350-kW transmitter at Fredrikstad, two 500-kW transmitters at Kvitsoy, and one 500-kW transmitter at Sveio. All of RNI's transmissions are automated. Starting in Oslo, programs are produced and fed to Fredrikstad, where computers relay transmissions to Sveio and Kvitsoy according to the target region of each program.

In 1985, Sverre Fredheim joined Radio Norway International as a journalist. Following the retirement of Thokle in 1988, Fredheim became the service's head. With a staff of 16 members including 10 full-time journalists, an engineer, administrative staff, and a various number of free-lancers, Fredheim heads the third largest external service in Scandinavia.

Radio Norway International is very unique in the fact that it is one of the few services that requires all staff members to be fluent in their native language and English. Yet, during a phone conversation from Oslo, Fredheim commented, "We are basically a Norwegian service...90 percent of our programming is Norwegian."

However, Fredheim conveyed that he is trying to change this situation stating, "The main thing that has happened since I have been in charge is that we have tried to expand our English output." On September 8, 1990, by adding a half-hour of English language programming on Saturday, Radio Norway doubled its English language output. Not being satisfied with the current increase in English language output, Fredheim expressed his support for additional programming remarking, "The expansion has been a very major thing for us and I hope to continue more expansion in the future."

There is a significant potential audience for Radio Norway's English programs. Fredheim commented, "Today there are more people of Norwegian decent in the United States than in Norway itself." Fredheim went on to recognize that while first generation Norwegian-Americans can listen to the Norwegian language broadcasts, second and third generation Norwegian-Americans, whose Norwegian is rusty, may prefer to listen to the English broadcasts.

More listeners are gained through Radio Norway's FM outlet in Oslo on 93-FM. With a NATO base located near the capital, and the fact that many Norwegian's speak English, the FM broadcasts have a sizable audience. Last, but not least, there are the thousands of shortwave listeners throughout the world who are interested in Norway.

One Radio Norway listener is Dwight Rideout of Maine. In an article in last November's edition of *U.S. News and World Report* entitled, "It's Time for the News: Where's Radio Norway?," Rideout was interviewed about his avid listenership of Norwegian news. In the article, Rideout was quoted as stating that he liked to listen to Radio Norway because RNI did not "pander to" its audience.

For most people interested in the latest news about Norway, Radio Norway International is the only outlet for information. Almost all of the U.S. media ignores the country completely. Fredheim wasn't surprised about the small amount of coverage Norway receives in the U.S. stating, "We are a small country and it does not surprise me that Norway is not the first country falling into your lap once you open your newspaper." Fredheim explained that Radio Norway tries to give as much in-depth background to their stories as possible to make up for the lack of information reported about the country.

When asked about a profile of the average shortwave listener, from the experience of meeting listeners at an ANARC convention and from being a self-described shortwave enthusiast, Fredheim commented that he thought most shortwave hobbyists get excited about listening to foreign broadcasters and are interested in the world around them.

The listener interest that Fredheim described is reflected in the 10,000 letters sent to Radio Norway on a yearly basis. About 70 percent of the mail received are comments on English language programming. Many letters

May Holme at the microphone.

Engineer Kai Kvilstad at the Kvitsoy site

Recording engineers are used rarely; transmissions can be recorded or updated at any time in a computerized transmission system developed by NRK staffers.

request QSL's, but most ask questions about the country. Audience questions range from such diverse topics as the Norwegian King to the democratic structure of Norway. However, some letters are more humorous. Fredheim stated, "Some listeners seem to think that polar bears are running around the streets of Oslo." Other listeners are extremely misinformed about Norwegian society and ask to have pornographic magazines sent to them.

When asked about the goal of Radio Norway's programming, Fredheim commented, "With our news and programming we try to convey what it's like living here." Norwegian life is conveyed through Radio Norway's 30-minute broadcasts, which begin with a 10 to 15 minute news segment (on Sundays this is followed by a Press Review). Following the news is "Norway Today," a program that surveys the main news events from the previous week and includes interviews, short features, and music.

The features included within "Norway Today" provide listeners with information about many aspects of Norwegian society. One popular feature is "The Scandinavian Business Report," which presents the latest in business news and is hosted by an American ex-patriot Beverly Stephansen. Additional features include "Science Norway," which covers a wide array of science topics ranging from new cancer treatments to a man who is investigating the possibilities of sailing a viking ship to the United States to recreate Leif Ericcson's voyage to North America. "Nature Notes" is a very popular program that covers ecology in the far north, "Trends and traditions" covers Norwegian culture, and "On the Record" broadcasts traditional Norwegian music.

The most popular features are "Listener's Corner," which presents audience comments and questions and "Rock Box," which reviews the Norwegian rock scene and is sometimes hosted by Fredheim. Fredheim commented that groups like "A-Ha" have popularized Norwegian rock. Fredheim remarked, "A listener in Britain, Brian Bullak, knows the Norwegian rock scene better than I do and he even offered to help us with our programming!"

"We are a bit hidden in our northern corner," Fredheim acknowledged, but by being host to the winter Olympics in 1994, Norway hopes to become more visible. Certainly the Olympics will be one of the major news events that will be reported on Radio Norway. Fredheim also hinted that there will be extended English programming from Lillelhammer, which will be the main site for the Olympics.

Additional stories to look for in the future on Radio Norway include the awarding of the Nobel Prizes, a possible visit by Gorbachev, and since Norway is a part of the UNIFIL peace keeping forces in Lebanon and has a big merchant fleet in the Gulf, news of the Middle East is also an important story for Norwegians.

Despite being a government owned service, Fredheim denied that the news content of Radio Norway is influenced by the government stating, "If the government tried to censor the broadcasts, there would be a lot of hell raised." He went on to state that government regulation of programming is contrary to what a democracy is about. Fredheim pointed to the program "Dissent" which spotlights opposition to government policies.

For those interested in QSLing, Radio Norway has a very strict policy. A listener must include the right time, the right frequency, and twenty minutes of program information, which is needed to ensure the reporting of any interference with other stations. As a part of the expansion of English language broadcasts on Saturday, on September 8th of last year, Radio Norway awarded a special QSL to the first hundred listeners to FAX or mail a verifications report. The response was huge. At the present time, no other special QSL's will be awarded; however, if you want to receive a QSL or want to write a letter, the address is Radio Norway International, 0340 Oslo 3, Norway.

Radio Norway International
Every Saturday & Sunday

UTC		Freq kHz
1200	South Asia, India, Australia	21695
	Middle East, India	17820
1300	Europe	9590
	Eastern Europe	11860
1500	North America	15305
	North America	17790
1600	Africa, Middle East	21705
1700	Europe	9655
1800	North America	17755
1900	Europe, Africa	15175
	Far East, Australia, New Zeal	21705
2200	S.America,Australia, New Zeal	21705
0100	North & Central America	15360
	North & Central America	11925
0200	North America	15360
0400	North America	11865

In a country known for its peaceful and cooperative style, Radio Norway has extended radio services in neighboring Scandinavian countries. Radio Norway currently has an agreement to transmit Radio Denmark's broadcasts. In addition to cooperation with Radio Sweden, the big news Fredheim is excited about is the vote by the Nordic Council to start a 5-nation service called Radio Scandinavia. If the funds for the news service are provided, Radio Norway will break new ground in international broadcasting by participating in the first multi-national external service.

As for the future, Fredheim commented that the inclusion of news from other Nordic countries could be a possibility. Also, with expansion of the English language service likely in the next couple of years, more shortwave listeners will discover the pleasures of spending a half-hour of their weekends learning about Norway.

COMMUNICATIONS ELECTRONICS INC.

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20 Channel • 5 Watt • Handheld Transceiver
Frequency range: 148-174 MHz. continuous coverage. Will also work 134-148 MHz. with reduced performance.
The *RELM* RSP500B-A is our most popular programmable 5 watt, 20 channel handheld transceiver. You can scan 20 channels at up to 40 channels per second. It includes CTCSS tone and digital coded squelch. Snap on batteries give you plenty of power. Additional features such as time-out timer, busy-channel lockout, cloning, plug-in programming and IBM PC compatability are standard. It is F.C.C. type accepted for data transmission and D.O.C. approved. We recommend also ordering the **BC45** rapid charge 1½ hour desk battery charger for $99.95, a deluxe leather case **LC45** for $48.95 and an external speaker microphone with clip **SM45** for $59.95. Since this radio is programmed with an external programmer, be sure to also order one **PM45** at $74.95 for your radio system.

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CEI understands that all agencies want excellent communications capability, but most departments are strapped for funds. To help, CEI now offers a special package deal on the RELM UC102 one watt transceiver. You get a UC102 handheld transceiver on 154.5700 MHz., flexible antenna, battery charger and battery pack for only $79.95. If you want even more power, order the RELM **UC202** two watt transceiver for $114.95.

NEW! RELM® RH256NB-A

List price $449.95/**CE price $299.95/SPECIAL**
16 Channel • 25 Watt Transceiver • Priority Time-out timer • Off Hook Priority Channel
The *RELM* RH256NB is the updated version of the popular RELM RH256B sixteen-channel VHF land mobile transceiver. The radio technician maintaining your radio system can store up to 16 frequencies without an external programming tool. All radios come with CTCSS tone and scanning capabilities. This transceiver even has a priority function. Be sure to order one set of programming instructions, part # **PI256N** for $10.00 and a service manual, part # **SMRH256N** for $24.95 for the RH256NB. A 60 Watt VHF 150-162 MHz. version called the **RH606B** is available for $429.95. A UHF 15 watt, 16 channel similar version of this radio called the **LMU15B-A** is also available and covers 450-482 MHz. for only $339.95. An external programming unit **SPM2** for $49.95 is needed for programming the LMU15B UHF transceiver.

NEW! RELM® LMV2548B-A

List price $423.33/**CE price $289.95/SPECIAL**
48 Channel • 25 Watt Transceiver • Priority
RELM's new LMV2548B gives you up to 48 channels which can be organized into 4 separate scan areas for convenient grouping of channels and improved communications efficiency. With an external programmer, your radio technician can reprogram this radio in minutes with the **PM100A** programmer for $99.95 without even opening the transceiver. A similar 16 channel, 60 watt unit called the **RMV60B** is available for $489.95. A low band version called the **RML60A** for 30-43.000 MHz. or the **RML60B** for 37-50.000 MHz. is also available for $489.95.

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If you are the dealer or radio technician maintaining your own radio system, you **must** order a programming tool to activate various transceivers. The **PCKIT010** for $149.95 is designed to program almost all RELM radios by interconnecting between a MS/DOS PC and the radio. The **PM100A** for $99.95 is designed to externally program the RMV60B, RML60A, RML60B and LMV2548 radios. The **SPM2** for $49.95 is for the LMV25B and LMU15B transceivers. The **RMP1** for $49.95 is for the RMU45B transceiver. *Programmers must be used with caution and only by qualified personnel because incorrect programming can cause severe interference and disruption to operating communications systems.*

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The *Uniden* line of Citizens Band Radio transceivers is designed to give you emergency communications at a reasonable price. Uniden CB radios are so reliable they have a two year limited warranty.

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WASHINGTON-A *Uniden* 40 ch. SSB CB base ... $209.95
PC122-A3 *Uniden* 40 channel SSB CB mobile ... $113.95
PC66A-A *Uniden* 40 channel CB Mobile $78.95
PRO510XL-A3 *Uniden* 40 channel CB Mobile $34.95
PRO520XL-A3 *Uniden* 40 channel CB Mobile $49.95
PRO535E-A *Uniden* 40 channel CB Mobile $73.95
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Bearcat® 200XLT-A

List price $509.95/**CE price $239.95/SPECIAL**
12-Band, 200 Channel • 800 MHz. Handheld Search • Limit • Hold • Priority • Lockout
Frequency range: 29-54, 118-174, 406-512, 806-956 MHz. Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz.
The *Bearcat* 200XLT sets a new standard for handheld scanners in performance and dependability. This full featured unit has 200 programmable channels with 10 scanning banks and 12 band coverage. If you want a very similar model without the 800 MHz. band and 100 channels, order the **BC 100XLT-A3** for only $179.95. Includes antenna, carrying case with belt loop, ni-cad battery pack, AC adapter and earphone. Order your scanner now.

Bearcat® 800XLT-A

List price $549.95/**CE price $239.95/SPECIAL**
12-Band, 40 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC
Bands: 29-54, 118-174, 406-512, 806-912 MHz.
Now...nothing excluded in the 806-912 MHz band.
The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 9¼" x 4½" x 12½." If you do not need the 800 MHz. band, a similar model called the **BC 210XLT-A** is available for $178.95.

NEW! Uniden® MR8100-A

Call 313-996-8888 for special CEI pricing
12-Band, 100 Channel • Surveillance scanner
Bands: 29-54, 116-174, 406-512, 806-956 MHz.
The *Uniden* MR8100 surveillance scanner is different from all other scanners. Originally designed for intelligence agencies, fire departments and public safety use, this scanner offers a breakthrough of new and enhanced features. Scan speed is almost 100 channels per second. You get four digit readout past the decimal point. Complete coverage of 800 MHz. band when programmed with a personal computer. Alphanumeric designation of channels, separate speaker, backlit LCD display and more. To activate the many unique features of the Uniden MR8100 a computer interface program is available for $19.95. Due to manufacturers' territorial restrictions, the MR8100 is not available for *direct* shipment from CEI to CA, OR, WA, NV, ID or UT.

NEW! Ranger® RCI2950-A3

List price $549.95/**CE price $259.95/SPECIAL**
10 Meter Mobile Transceiver • Digital VFO Full Band Coverage • All-Mode Operation Backlit liquid crystal display • Repeater Splits RIT • 10 Programmable Memory Positions
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The *Ranger* RCI2950 Mobile 10 Meter Transceiver has everything you need for amateur radio communications. The RF power control feature in the RCI2950 allows you to adjust the RF output power continuously from 1 watt through a full 25 watts output on USB, LSB and CW modes. You get a noise blanker, roger beep, PA mode, mike gain, digital VFO, built-in S/RF/MOD/SWR meter. Frequency selections may be made from a switch on the microphone or the front panel. The RCI2950 gives you AM, FM, USB, LSB or CW operation. For technical info, call Ranger at 619-259-0287.

RELM LMV2548B Only $289.95

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FBW-A Frequency Directory for Western U.S.A..... $14.95
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An Inside Look at Looking Glass

Story and Photos by Bill Battles

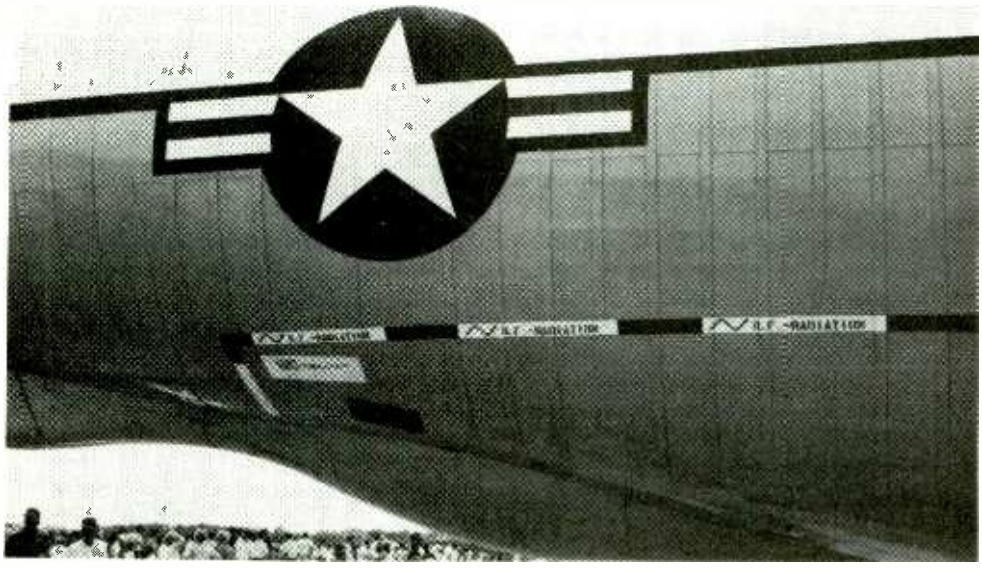
Since Feb. 3, 1961, a very special airplane has flown every day, 24 hours a day, continuously. The official name for this plane is "Strategic Air Command, Post Attack Command and Control Airborne Command Post."

Quite a mouthful to be sure. It is probably more well known by the title of "Looking Glass," so named because its equipment is a mirror image of the Strategic Air Command (SAC)'s underground command center. It was designed to provide a survivable means of command and control should the underground command center be rendered ineffective due to attack or other events.

Like many military aircraft buffs, I had heard of Looking Glass, but never saw much in print about it in military or radio magazines. Recently, I was lucky enough to get to see a Looking Glass at an air base open house. Best of all, it was open for the public to walk through. I figured others might like to have a "look" also, so let's take a tour.

At first glance this plane looks like just another KC-135 refueling tanker but as you walk closer you notice some important differences. This plane is called an EC-135. The "E" stands for electronic and it's painted in a slightly different scheme than a tanker. The bottom half is standard Air Force gray and the top is white. A black stripe separates the two colors.

Another noticeable difference is that this plane is covered with radio antennas. Several are dome shaped, one in the top center is diamond shaped and black in color, and there are two long wires running from the tail down to the top of the fuselage near the front of the plane. These are all in addition to the standard "blade type" antennas found on most planes for VHF radio communications. You also can't help but notice a red stripe on the underside of the tail area with white lettering which reads, "RF Radiation."



RF Radiation signs near the tail are one tip-off this is no ordinary KC-135 refueling tanker.

As you walk aboard on the port (left) side you notice lots of panels marked "Buss" for the electrical system. To the left is a small electric range for cooking. Turning right and walking toward the wing area, you enter a room with many swivel-type high backed seats face racks and racks of communications gear.

Behind this room another area is sectioned off and is decked out with still more gear -- including computer screens and keyboards, radar screens and other interesting electronics. Telephone-type handsets can be seen, also. Following this "room" is a smaller area that contains a rest area with bunks for crew members to use in the event of extended flight.

There is also a refueling boom operator's position in the tail section for refueling other aircraft and the EC-135 has a receptacle near the cockpit roof so it is capable of taking on fuel while in flight.

Control on Command

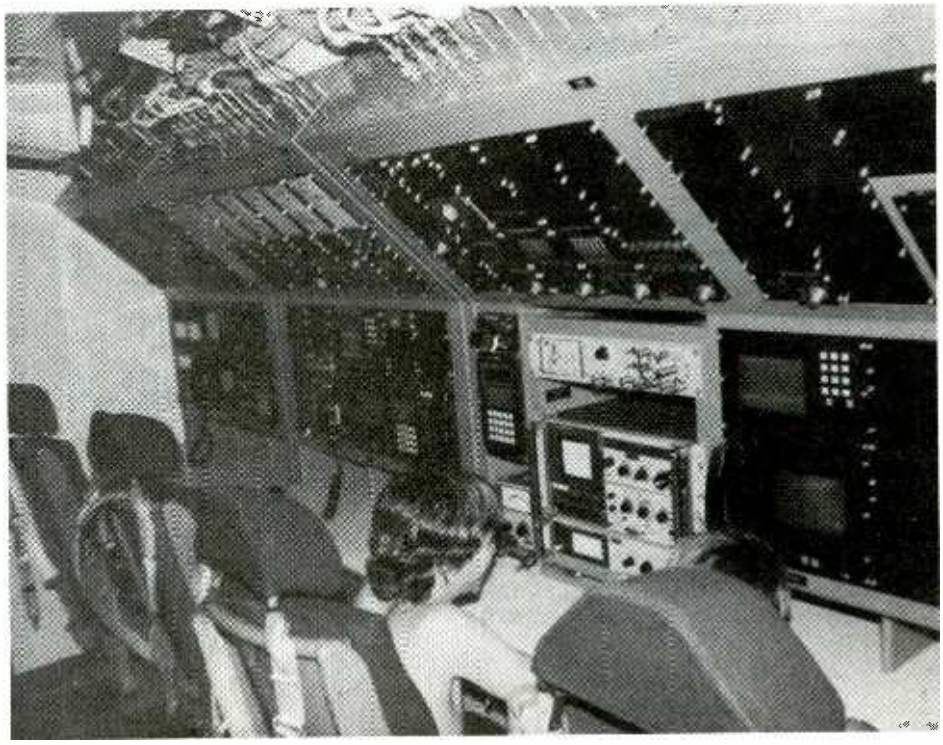
In the event of nuclear attack, these rooms become an airborne command center capable of handling communications ranging from VLF to UHF, including HF and voice, data, secure voice scrambling, satellite communications and the full range of modes that SAC can access.

There are also controls for launching the entire Minuteman/Peacekeeper missile force if needed. The launch system includes the two-key system where both operators must insert and turn their keys at the same time, as simulated in some popular Hollywood movies such as "War Games." In addition to the two-key safeguard, there is a third: the pilot also has to throw a switch up in the cockpit to enable the rear launch system.

A general must be onboard at all times when an EC-135 is acting as Looking Glass. The general has a key and another designated crew member has a key which are used to open a vault onboard. Inside this vault are the two launch keys and launch information they would need. Ground launch centers and missile silos have only the two-key system, so the Looking Glass has one more step in its safeguard system.

A normal crew consists of 20 to 25 people. When a Looking Glass gets airborne, it must establish communications with the SAC Command Center, the National Command Authority (NCA; president and joint chiefs of staff), SAC aircraft, ground bases, etc., before the plane they are relieving is allowed to land. This ensures a constant functioning unit in the air at all times. A typical flight is 8-1/2 hours duration, and three flights are used per 24 hour period. Recent news items suggest this has been cut back recently.

The general onboard is designated the Airborne Emergency Actions Officer. He is in charge of combat control, operations plans, intelligence, logistics, communications, maintenance and sometimes weather officers and engineering officers. Shortwave listeners who monitor SAC's "Giant Talk" net will be familiar with the term Emergency Actions Message, a coded message broadcast over several SAC, Air Force and Navy HF nets.



A couple of youngsters fantasize behind communications equipment in the first compartment.

EC-135 CREW SEATING PLAN

(keyed to drawing)

Flight Crew

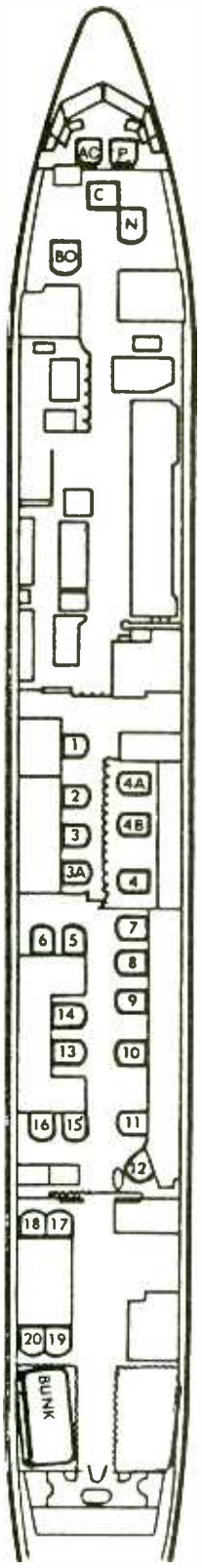
AC.....aircraft commander
P.....pilot
C.....crew instructor
N.....navigator
BO.....boom operator

Communications

1,3A.....inflight maintenance technicians
2,3.....radio operators
4,4A,4B.....data system operators

Battle Staff

5,6.....logistics officer/NCO
7.....force status NCO controller
8.....emergency actions NCO controller
9.....director, airborne battle staff
10.....airborne launch control system officer
11.....airborne emergency actions officer
12.....communications control officer
13,14.....operational planning officers
15,16.....intelligence officers
17.....weather officer
18.....engineering officer
19.....aircraft passenger specialist
20.....spare



COMPONENTS

SAC Airborne Command Post *(Looking Glass)* and East Auxiliary Command Post stationed at Offutt AFB, Neb.; West Auxiliary Command Post and Airborne Launch Control Centers 1, 2, and 3 stationed at Ellsworth AFB, S.D.; and Radio Relays 1 and 2 stationed at Grissom AFB, Ind.

AIRCRAFT SPECIFICATIONS

Airframe.....Boeing EC-135
Engines.....four TF33-P-9
Thrust.....18,000 lbs each
Maximum takeoff weight.....300,000 lbs
Maximum speed.....600 mph
Range.....> 5,000 miles
Typical mission duration.....8.5 hours
Dimensions:
Wing span.....130 ft
Length.....128 ft
Height.....42 ft

Air Force Fact Sheet

The second room houses the electronics gear used by the battle staff.

Public records indicate that 21 EC-135 aircraft are in the U.S. Air Force inventory. Each one costs around 90 million dollars, according to a crew member I spoke with. All EC-135s can do the Looking Glass mission but only one is so designated at any given time. The rest are used as special airborne communications platforms which can circle the globe to relay communications if needed. It is believed these are kept at various bases worldwide and are used from time to time when Air Force One goes to summits like Geneva, Switzerland, and other areas where normal means of communications back to the U.S. would be limited.

Many people confuse these planes with the E-4B National Emergency Airborne Command Post (called "Kneecap" due to the NEACP initials). NEACP is the presidential counterpart of the SAC airborne command post, to be used in the event of national disaster or war. Built on a Boeing 747 airframe, there are four in inventory, one of which is kept on standby alert at Andrews Air Force Base at all times.

Behind the Looking Glass

Three SAC units furnish flight crews, battle staff, and airplanes for missions with the EC-135. They are the 2nd Airborne Command Control Squadron at Offut AFB, Nebraska; the 4th ACCS at Ellsworth AFB, South Dakota; and the 70th Air Refueling Squadron at Grissom AFB, Indiana.

The communications staffs are provided by the 2148th Communications Squadron at

Ellsworth and the 1915th Communications Squadron at Grissom. With the need to monitor communications from the SAC underground command posts, National Military Command Centers, and SAC alert forces, these communications crews are a vital part of flight missions.

Long time SAC utility monitors have the theory that Looking Glass units use eight-letter call signs. If you happen to hear the call sign War-46 (Ft. Ritchie, MD, NCA underground command center) calling Marigold or another eight-letter call sign, you just might be listening to "the Glass." Or if when listening to SAC Giant Talk (SAC's HF failsafe communications system), you hear a mention of a tanker rendezvous being set up to "refuel the glass," it's the ever-vigilant Strategic Command airborne command center.

As I left the plane, I was very glad I attended this open house and was able to see this impressive aircraft. I also am an artist and like the nose art painted on the port side. It's a picture of Alf, the alien TV character, standing in front of an American flag with the words "No problem" lettered underneath it. Judging by the amount of thought that went into designing this special plane, I would have to agree. If you have never listened to Giant Talk HF comms, give it a try.

I would like to thank the crew of the plane I toured, who roasted inside it in the hot sun the day of the airshow. They were very kind and professional in assisting people touring the plane. Special thanks also to Sergeant Angel M. Newman of the public affairs division at Offut AFB, Nebraska, for assistance in making this article possible.

Where to Look for Looking Glass

Below are some HF frequencies which are used for Looking Glass voice comms. The frequencies are referred to by designators. All freqs in kilohertz.

Frequency	Designator	Frequency	Designator
3113	Sierra 302	11494	Sierra 311
3295	Sierra 303	12070	Whiskey 108
4495	Sierra 304	13211	Sierra 312
5700	Papa 381	13217	X-Ray 906
5800	Whiskey 101	13247	Whiskey 109
5826	Papa 382	15044	Papa 383
6730	X-Ray 903	17972	Whiskey 111
6757	Whiskey 103	17992	X-Ray 908
7475	Whiskey 104	18397	Whiskey 112
7831	Whiskey 105	20124	Whiskey 115
9017	X-Ray 904	20167	Whiskey 116
9057	Sierra 309	11220	Sierra 310
11226	X-Ray 905		

In addition to these frequencies, the SAC primary air to ground frequencies are also helpful. The night frequency of Sierra 391 and the day frequency of Sierra 393 are a good starting point.

Listen for eight letter units asking ground stations for "primary and secondary working frequencies for station ____" (This is a new Looking Glass coming out for duty requesting the current Looking Glass unit's primary and secondary frequencies so they can establish the HF part of their many comm links, and this unit will also have an eight letter callsign.) Air to ground primary frequencies are listed below:

Frequency	Designator	Frequency	Designator
4725	Sierra 390	11243	Sierra 393
6761	Sierra 391	13241	Sierra 394
9027	Sierra 392	17975	Sierra 395

Looking Glass can also be heard on the SAC primary UHF frequency of 311.0 (AM), as well as on the U.S. Air Force GCCS (Global Command Control Station) frequencies, as well as VLF and Satcom frequencies.

The All-Continent QRP Game

by Charles Sorrell

Most shortwave broadcast DXers have come to the rather scary realization that, over recent years, enough half million watt transmitters have come on the air to power all the electronic bug killers in Florida for the next millennium. Their little 250 kW brothers are as numerous as fleas on a dog.

More than one "old timer" has told me about the good old days when one could sit back and enjoy armchair copy from a 200 watter in Costa Rica or some romantic Pacific isle right in the middle of what today is the jungle on 9 megahertz. Today even a lot of the lower-powered 100 kilowatt stations -- peanut whistles by comparison with the really big boys -- are hard to hear.

If there were an equation, a formula for figuring how good a DX catch you've made, the transmitter power would surely be one of the factors. Because, as a general rule, the real DX stations are those running powers of 10 or 5 or 1 kilowatt -- or even less. They are the stations which are likely to present the toughest targets for the DXer who wants something really meaty to chew on.

One of the DX goals you can set for yourself revolves around a station's wattage. It's called "All Continent QRP." Your All Continent QRP (low power) rating is figured by totaling the powers of the lowest power station you've heard or verified on each continent, excluding Antarctica.

A couple of decades ago a determined, dedicated DXer wouldn't have had an inordinate amount of trouble working his or her way down to an All Continent QRP total of under 5 kW, even under 1. But that's a lot more difficult today. It may not yet be impossible, but it's close to it.

For example, in order to get really low power loggings from Europe you have to chase the European pirate stations or the difficult Italian private stations. Listeners in the eastern North American time zone have some chances to hear these but there's not much hope for DXers in Colorado and California.

Africa sports just a few stations of fairly low power and the Pacific is rapidly losing these too. The Papua New Guinea two kilowatters are even now in the process of being upgraded to 10 kW. Other low power

Radio Rebelde runs 10 kW on 5025.

Pacific stations are simply disappearing. The only real low power goldmines left are in Indonesia (for Asia) and Central (North) and South America.

Trouble is, it takes only one continent with slim pickings to louse up your whole game. But, given a good deal of effort, it's still possible to get an All Continent QRP of under five kilowatts. With extra time, determination, and luck, you might even break one kilowatt.

Summertime may not be the best time to start a search of low-powered stations. In fact, if you do, conditions will have the deck pretty well stacked against you. Still, the fun is in the trying. To get you going, here are some suggestions on reaching several levels of decreasing QRP totals.

UNDER 100 KILOWATTS

Europe - A good beginning is to look for Radio Macedonia, the Greek regional station which runs 35 kw. 9425 carries this service to Europe from 1900-2000, though there's some question as to the real power used on this frequency. 9935 to the Mideast and 11585 to Europe are in use between 1000 (0600 Saturdays and Sundays) to 2225, all in Greek.

Africa - ORTB from Contonou, Benin, on 4870 is a fairly easy one when the Africans are running. Look for it at sign on at 0455 (0555 on weekends). Power is 20 kW.

Asia - Radio Republik Indonesia at Ujung Pandang runs 50 kW on its usual 4719, but that's too much. Look for them when they make occasional use of the alternate 4753, which is rated at 20 kW. Again, summertime isn't the best time to get your QRPing under way. Why not wait until fall? Try around dawn.

Oceana - Go for the Australian Broadcasting Commission regional at Wanneroo, Perth, VLW6, on 6140 during your local morning hours, anytime after 0945 sign on. Power is 10 kW.

North America - We're up to 85 kW already but no need to panic as there are lots of low power choices in the Western Hemisphere. For North America, try Adventist World Radio's Radio Lira in Costa Rica, running 5 kW on 11870. It airs from 1100-1500, often providing quite good reception.

South America - Another 5 kilowatter is the Colombian, La Voz del Cinaruco from Aruca, running 24 hours a day on 4865.

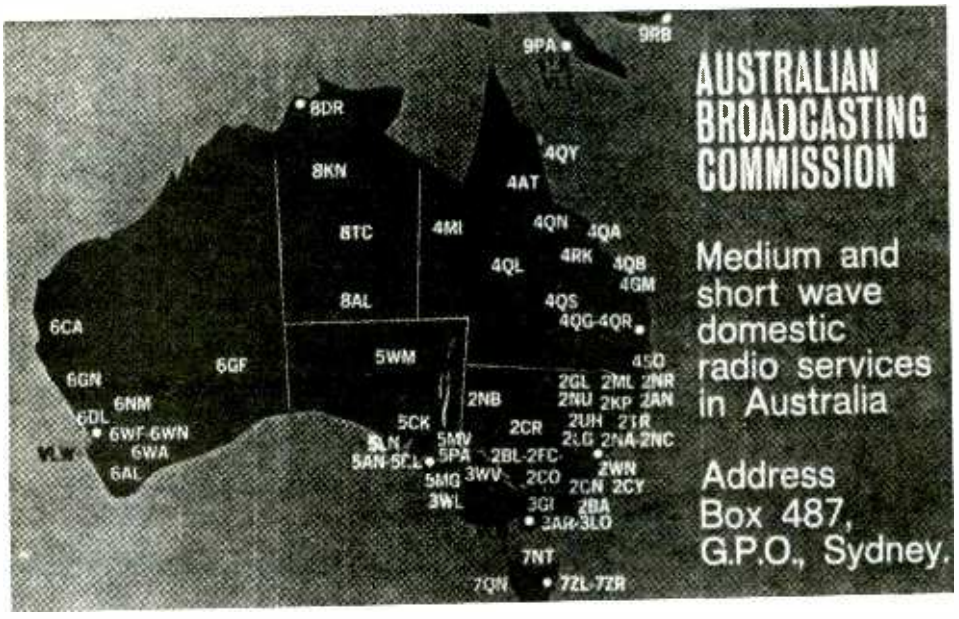
Total QRP - 95 kW.

UNDER 50 KILOWATTS

Europe - Try one of the German state public broadcasters which use shortwave, specifically Sudwestfunk, which has 20 kW on 7265, all in German. It's most likely to show during the late night hours.

Africa - A fairly easy African, again, when conditions are clicking, is the Equatorial Guinea station Radio Nacional, Malabo, which uses 10 kilowatts on 6250. Check for an 0500 sign on, in Spanish.

Asia - Turkish Meteorological Radio on 6900 runs five kilowatts and signs on just prior to 0500, in Turkish. This one seems to be heard in streaks, nothing for weeks or months, then there'll be a number of reports of it. You just have to keep checking.



Many of the Australian ABC stations use 10 kW.

Oceana - Try the National Broadcasting Commission, Papua New Guinea, on 4890 around local dawn. It's listed as two kilowatts, but it's possible it may have been increased by now.

North America - An easy mark is the 10 kW Cuban, Radio Rebelde, which holds forth nightly on 5025, all in Spanish.

South America - Chase down the Ecuadorian, Escueles Radiofonicas Popular, recently reactivated on 5011 and running one kilowatt. Sign off is nominally 0200.

Total QRP - 48 kW.

UNDER 10 KILOWATTS

Europe - Lots of checks will eventually provide Radio France International's four kilowatt transmitter serving Europe on 3965. Late night offers the best bet.

Africa - Radio Candip, from Zaire, uses a one kilowatt transmitter on 5066 which is often picked up by North American DXers. It signs on at 0330 and runs to 0600 in French and local dialects, from the town of Bunia.

Asia - The Defense Forces Station at Myanmar, Burma, on 6570 is reported to just one kilowatt. It, too, is fairly easily heard in the early morning hours. If you're planning to try and QSL your catches you'd better find a substitute for this one, though, as there are no known replies from this station.

Oceana - Check 3275 around local dawn for another Papua New Guinea station, Radio Southern Highlands. As noted before, there's a chance this one, too, has gone from two to 10 kW.

North America - One of the private Canadian stations, CHNX in Halifax, Nova Scotia, on 6130 will fill the bill with 500 watts. It runs 24 hours a day and deep night, after midnight, when the interference is less, is the best time to get a log.

South America - A pretty easy catch is the one kilowatt Venezuelan, Radio Valera, on 4840 with all Spanish programming to around 0400 close.

Total QRP - 9.5 kW.

UNDER 5 KILOWATTS

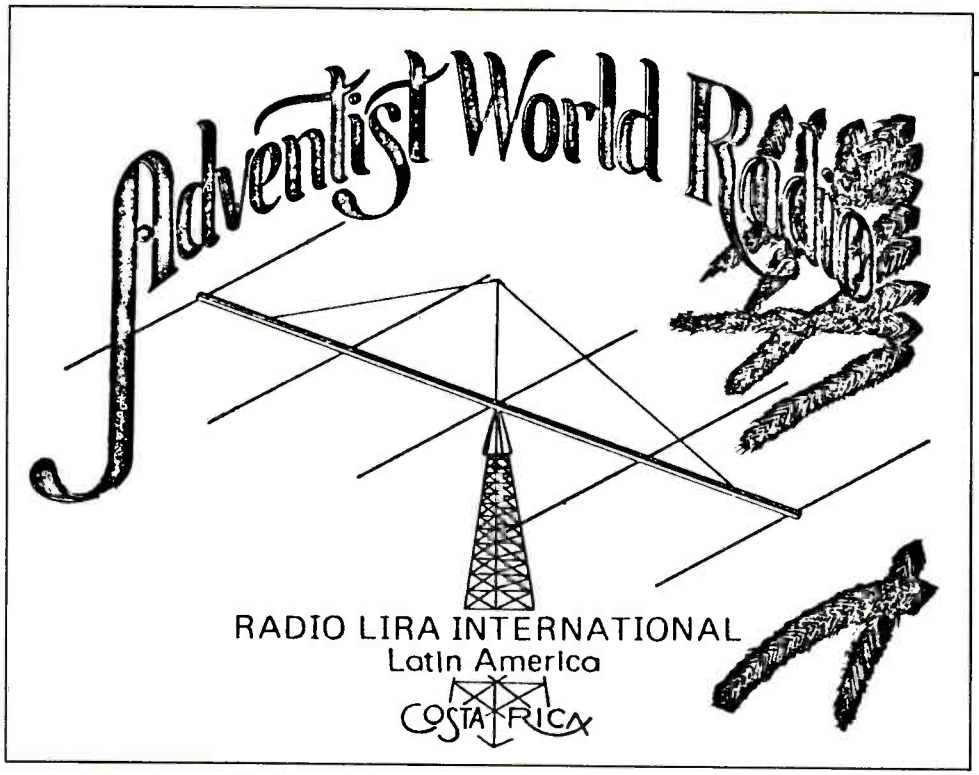
Europe - There are two private Italian stations, each running 500 watts: Radio Italia International from Spoleto on variable 7140 airing from 0700-1700 and Radio Europe at Piolello on 7294 from 0700-1200.

Africa - The Angolan regional, Emisora Provincial de Benguela, is occasionally heard on variable 5041, scheduled for 0350 sign on using one kilowatt. All Portuguese programming.

Asia - Look for the Indonesian regional Radio Republik Indonesia at Sibolga, which uses one kilowatt on 5260. Try around local dawn.

Oceana - Radio For the Print Handicapped from New Zealand has been heard by some North American DXers and persistence should pay off eventually. It uses one kilowatt on 3935. Try very late at night up until 1100 close.

North America - Try Guatemala's Radio Cultural, popularly known as TGNA on 5955 around 1000 sign on, or in the evening hours.



Adventist World Radio's Radio Lira in Costa Rica uses a 5 kW transmitter on 11870.

The transmitter on this frequency is listed for 250 watts. Those on other frequencies run higher power. Usage of 5955 may be somewhat irregular, however.

South America - Try Radio Continental, Barinas, Venezuela, with one kilowatt on 4940, often closer to 4939, in Spanish during local evenings.

Total QRP - 4,450 watts.

UNDER ONE KILOWATT

Europe - We must search out the Europirate Radio Orang Utan which runs 100 watts, sometimes 200, on 6025 variable. It's active on an irregular basis Sunday mornings from 0700.

Africa - There used to be Africans with powers around 350 watts which fit the bill perfectly. At the present time, though, the only choice is the impossible -- Tristan Radio running 40 watts on 3290. What we need is a 500 watt station to come on the air from a place like Maderia. Might as well get a new country while we're wishing.

Asia - Check 3377.5 for Radio Japan/NHK from Osaka which uses only 300 watts. Try early mornings, say 1100 or 1200.

Oceana - Radio Kiribati's single sideband transmitter on 14917 is listed for 250 watts. Check around 0600, especially during the summer months. Programs are in English and Kiribati.

North America - Another Canadian, CFVP, in Calgary on 6030, contributes 100 watts. Like the other Canadian private stations, it's on 'round the clock and late night/early morning provide the best chance for reception.

South America - There are innumerable stations which will work here, especially from Bolivia and Peru. Let's take 4461 variable for Radio Nor Andina in Celendin running 180 watts. Check mornings around 1000 or evenings around 0100/0200.

Total QRP - 920 watts.

OKAY. HOW LOW CAN YOU GO?

Ed McMahon will be knocking on your door with a million dollar check before you bag all of the following:

Europe - There's Radio Plato, a sometime active Europirate on 6239 which, at least some of the time, runs a dinky four watts.

Africa - Well, Tristan again at 40 watts.

Asia - Indonesia supplies Radio Programa Hiburan dan Informasis Daerah Tingkat Dua Indragiri Hilir, listed for just 30 watts.

Oceana - Call on Kiribati again for 250 watts.

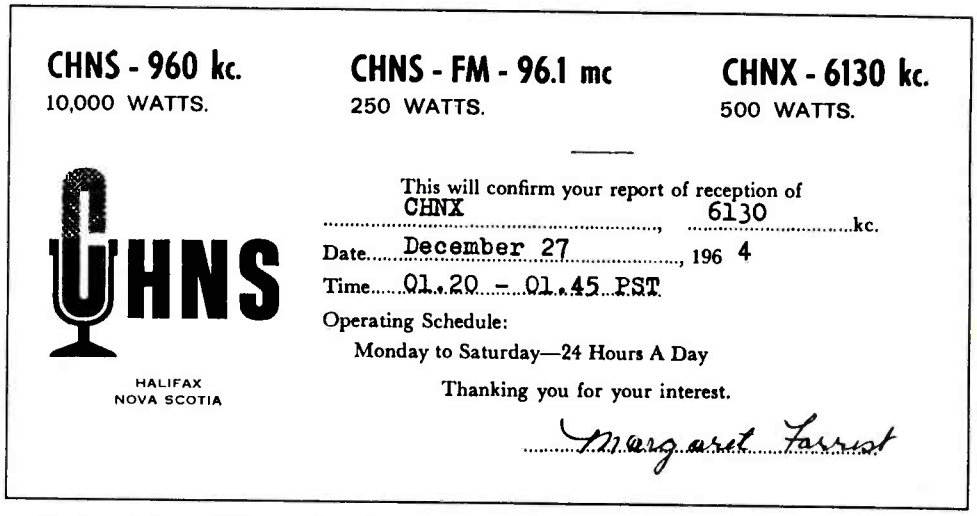
North America - The mighty CKFX in Vancouver on 6080 has 10 watts. Actually, any number of DXers have heard this one during its 24-hour per day schedule.

South America - Radio Illucan in Cutervo, Peru, has 100 watts on 5618. Actually there are South Americans of even lower power on the air at one time or another. A couple of years ago one Peruvian actually heard in North America was running just 12 watts. The powers of many of the Peruvians are simply unknown so it's not possible to tell just how well we could do with South America at any one time.

Total "How Low" QRP - 434 watts.

You won't manage that QRP dream team, but, with effort, you may do a lot better than you think. Put your DXing "powers" to work and good luck!

mi



One of the 500 watt private Canadian stations -- CHNX on 6130, relaying CHNS -- 90 kW medium wave.

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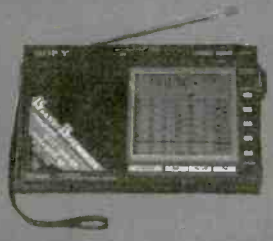

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  SW Guide Book
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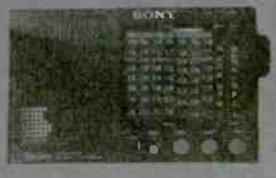

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Some Operating Tips for the DX-440/ATS-803A

by David Lewis

There we were on Christmas morning, two parents watching a delighted 8-year-old pulling ribbons and colored paper off presents. I vaguely remembered how excited I used to get when I was that age.

As I returned from the kitchen with my second cup of coffee, my daughter handed me a pretty box, saying, "Your turn, Daddy." "What is it, a radio?" I asked as I started unwrapping. "Radio" was an old joke around here. Then the red box became visible. "Wow," I shouted, "it *is* a radio."

It was a radio all right, the Realistic DX-440, one which I'd heard much about. With trembling hands I installed the batteries, extended the whip antenna, turned it on and punched in 9580 on the keypad. "This is Radio Australia," it said. "Oh boy oh boy oh boy."

Many hours of button pushing later, I'd like to share a few ideas with other new owners of the Realistic DX-440 (or the Sangean ATS-803A, which are in fact virtually identical).

Tuning

There are three methods of tuning the radio: 1. With the tuning knob on the right side of the case, 2. With the buttons marked "down" and "up" under the right side of the display on the front panel, 3. With the numeric keypad below the left side of the same display.

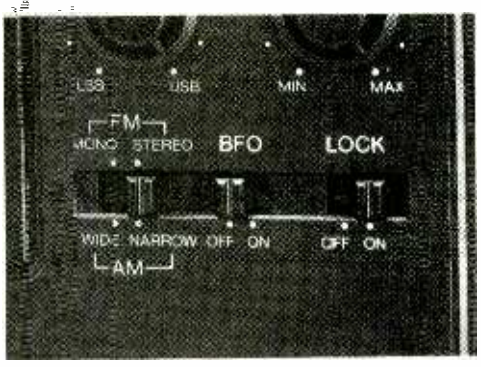
All three methods have their uses, but by far the most useful is the direct entry method using the numeric keypad. Just enter the desired frequency in kHz, including all zeros, and press "execute.

This radio works in two modes: AM and FM. The correct mode must be selected before entering a frequency. The FM mode is selected with the lower left button on the keypad. Any of the other buttons in that row across will select the AM mode. The radio stays in the selected mode until changed.

The AM mode is used for all shortwave reception. Look up a station you want to hear in the frequency section of this issue, and key in the frequency as described above. Any of the major world-band broadcasters can be tuned in this way.

BFO tuning

Single sideband (SSB) is a form of AM reception used by hams and utility stations such as commercial and military aircraft, ships at sea, various government services, and even a very few international broadcasters. Regular AM signals contain



a "carrier wave" which is the background signal you can hear even when the announcer isn't talking. SSB signals do not use this carrier, rendering these transmissions unintelligible without the use of the BFO (Beat Frequency Oscillator), which inserts the missing carrier.

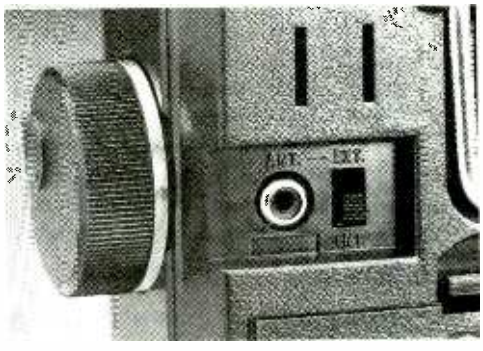
AM shortwave broadcast signals are "wide" in frequency and can be tuned in clearly within one or two kHz. The far right hand digit of the frequency display is one kHz. An SSB signal, however, needs to be tuned in "right on the money" to be understood, and the BFO Pitch control allows you to place the inserted carrier precisely over the SSB signal for clearest reception. SSB signals often are not exactly on the even kHz so plan to do some fine tuning with the pitch control when listening for these stations.

If you would like the frequency display to be most accurate when tuning with the BFO on, tune WWV on 5000, 10000, 15000 or 20000 kHz, and then adjust the pitch control for "zero-beat" or the lowest sounding note. Your receiver will then be aligned on the even kHz as displayed. This is useful for tuning commercial aircraft frequencies which usually are on the even kHz.

Antennas

While the built-in whip antenna is fine for moderately strong broadcast signals, I recommend an external antenna for reception of ham and utility stations, as well as weaker shortwave broadcast signals. This antenna can be as simple as 15 or 20 feet of plain copper wire stretched around inside a room and connected to the radio's whip with an alligator clip.

A better antenna would be 50 feet or longer, suspended between the house and a tree using end insulators and connected to



the radio's external antenna jack with an RCA plug. In this case, either disconnect the antenna from the radio when it's not in use or use some form of lightning protection. And, of course, when erecting an antenna, keep it away from power lines. Failure to do so could have fatal consequences.

On a recent trip from Maine to Florida, during which we frequently stayed in campgrounds, I stretched out 20 to 30 feet of wire each night and was rewarded with excellent reception of most of the signals I wanted to hear -- considerably better than with just the internal whip.

At home I connected my DX-440 to a 550 foot long-wire antenna and was amazed at the number of signals that showed up in all frequency ranges. On the AM broadcast band I was able to hear several strong stations from New York City, some 400 miles away. This would not seem unusual except for the fact that it was around noon, local time.

When you do use an external antenna, the receiver can be overloaded by strong signals on frequencies other than the one tuned in. Reducing the RF gain control will usually solve this problem. There may be times when some signals can be heard more clearly with the external antenna disconnected.

Memories

Nine memories doesn't seem like enough to keep stations permanently available for recall, but they are great for use during a given listening session. Oh, I'll admit I keep my two or three favorite local FM stations in slots one through three, but I am constantly changing four through nine as I tune around the bands and find a station I expect to get back to in a couple of minutes.

When I listen to BBC, for instance, I'll enter three or four of its frequencies in memories, then have the ability to rapidly switch between them to keep the clearest signal as propagation shifts.

A good use of the memories is to listen in to both sides of a "split-frequency" conversation. An example of this would be a marine ship-to-shore channel pair, where the ship transmits on one frequency and the shore station is on another. Listening to either frequency alone just yields one-half of the conversation, but by entering both frequencies in memory and then switching back and forth quickly, both sides can often be heard. A list of marine frequency pairs appeared in the January 1991 issue of *Monitoring Times*.

Hams sometimes operate split frequency, particularly when a US ham is talking to a foreign ham who is able to operate in a less crowded band segment than the US station.

We have only begun to discover the versatility of a radio like the DX-440/ATS803A. I suggest you read a review of this receiver in *Passport To World Band Radio* for further information.

Write On!

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CIRCLE 123 ON READER SERVICE CARD

My Shortwave Radio Phase

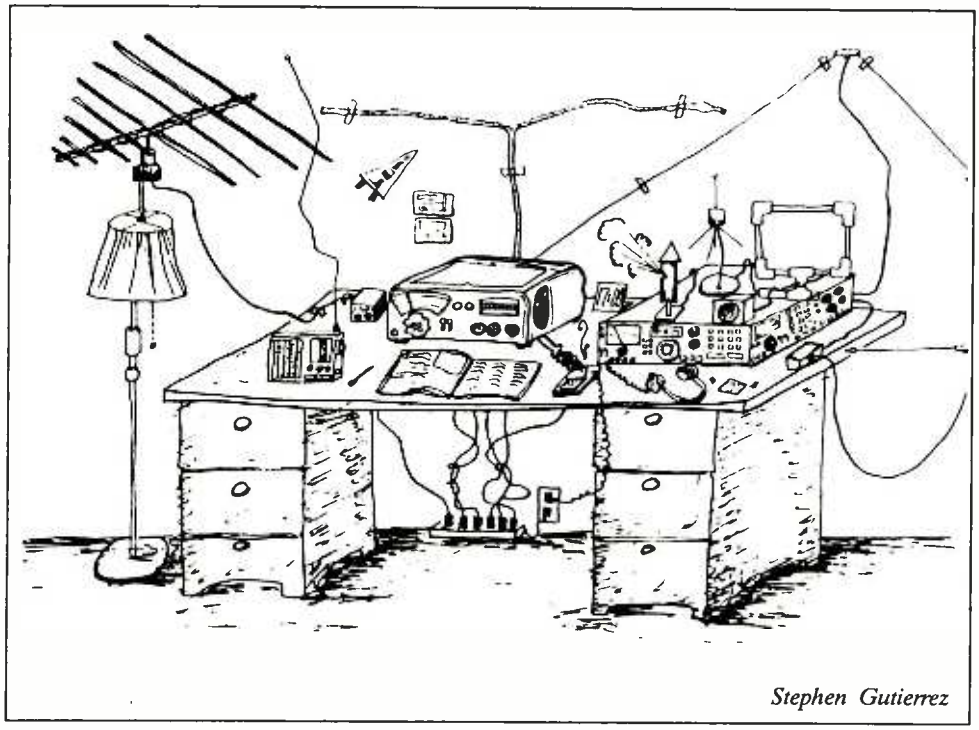
by Stephen Gutierrez

Each of the three shortwave radios I've owned marked an important phase in my life. I purchased my first receiver as a graduate, fresh out of college. I was going to use the tiny seven band analog receiver to tune in exotic local stations during my travels around the world. Though neither my radio or I ever left the United States, I did listen to foreign broadcasts. I remember tuning in my first foreign station, Radio France International.

After fussing with the disproportionately long antenna, I turned the tuning knob until a French voice interrupted the static just long enough to fade away. It took some careful twiddling and fidgeting but I managed to hold on to that distant voice and listened to an entire news broadcast. I imagined myself sitting at a white metal table sipping espresso underneath an umbrella that had CINZANO written on it and watching the Parisian passersby.

The second shortwave radio I bought marked a settling down period. I landed a comfortable job at a bookstore and bought an old tube radio. I traded my sleek seven-band portable for a bulky seven-tube Hallicrafter with a big, warmly-lit front panel, some wax-yellow dials and plenty of worn, chunky black knobs. I bought it at an old electronics store housed in a huge brick building with plywood-covered windows.

My first reaction upon pushing through the noisy door was the feeling that I had entered an archaeological site. Hundreds of stereo receivers, tuners, amplifiers, pre-amplifiers, turntables, television sets, speakers, and radios were stacked and piled and heaped in an enormous column of disarray which extended from where I stood, far back into impenetrable darkness.



Stephen Gutierrez

A small table with a gooseneck lamp drew my attention and I walked carefully toward it. On the table were pieces of food and electronic parts which looked like remnants of the same meal. Suddenly, the owner appeared from the gloom and put his hand on top of a waist-high stack of amplifiers, as if the touch of dust and metal comforted him. "Can I help you?" he asked.

We found the Hallicrafter in a torn cardboard box and placed it on top of a large speaker. The owner unwound the plug from the back of the radio and plunged his arm into a tangle of wires where an outlet was hidden. The Hallicrafter's old tubes began to glow and the front panel lights asserted themselves, watt by warming watt. I peered at the shapes taking form in the darkness around me and noticed much of the equipment was old and had been personalized with a variety of arcane markings.

Bits of brittle masking tape with curious symbols were pasted above round sockets with many comma-like holes. Gobs of solder with little pieces of wire embedded in them were stuck to knurled posts. Some of the knobs underneath the dials had shiny circular tracks around them.

As I looked at these signs, I realized that all these pieces of electronics equipment had been cared for and tinkered with during many hours of patient use. I liked the idea that my radio once belonged to someone who must have had a similar curiosity about listening to places that were far away. I imagined them

spending long hours hunting for those elusive, faint voices.

We didn't hear much in the store, but I took the grey metal box home nonetheless. I spent hours cleaning each tube, wiping the grime from the back of each dial and carefully putting a shine on the brass inserts embedded in the black knobs. When I finally attached an antenna wire to a bent post and watched the orange glow slowly brighten, familiar voices from across the ocean hissed and crackled into my room. I didn't remove any of the bits of tape or erase the numbers scrawled around the back panel. I figured that someday they would reveal their meanings to me.

Six months after I bought the Hallicrafter I entered my third radio phase -- the worst kind of radio phase there is. I call it the "Technology Worship" phase. I sold my Hallicrafter and began memorizing the contents of the mail-order catalogs that are a staple in the diet of those who succumb to the lure of what my wife disdainfully calls "radio stuff."

During this phase, I was no longer interested in hearing those loud, obvious international broadcasters. I wanted to listen to faint utility signals. To do that, what I needed in the way of a radio was something that had lots of state-of-the-art digital readouts, synchronous detection, USB, LSB, memory channels, programmable timers and enough soft-touch key pads and liquid crystal displays to make an astronaut happy.

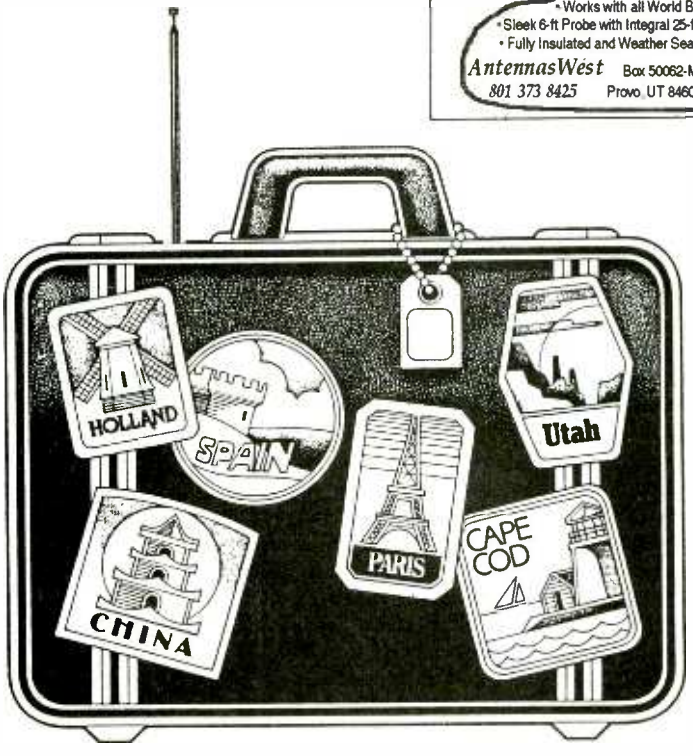
I ordered one and a couple of days later it arrived in a box. At first, I kind of missed the orange glow of the Hallicrafter, but after I learned to use the new radio, I began to hear frequencies I had previously only read about.

These days I've gone far beyond the uncertain hit and miss phase of my first radio, the nostalgia of my second radio, and the high-tech thrills of my third. I spend most of my time fooling around with antenna formulas. On weekends I suspend critical lengths of wire from trees and flick smoking drops of solder off the carpet. Every now and then I even manage to turn on my radio and relish some inaudible whisper from a trawling ship a thousand miles away.

Once in a while, I'll press a single button and listen to the crisp voice of a Radio France International broadcaster. As I take a sip from my espresso, and remember how I got started in this wonderful hobby, I begin to think about my next radio and my next radio phase -- and I wonder where in the world it will lead me.

mt

If you have a story of how radio has played a part in your life or the life of your community, send it to Monitoring Times. *All stories should be true, real life events. Manuscripts should be approximately 1,500 words and must include at least one clear photograph or other illustration.*



Shortwave Broadcasting

Glenn Hauser
Box 1684-MT
Enid, OK 73702

ALASKA (non) A program from KNLS is broadcast all over the USSR on All Union Radio network 1, AM, FM and SW, Tuesdays at 2105-2205 UTC (A.V. Nekrasov, Moscow, *Play DX*)

ALBANIA R Tirana at 0230 and 0330 on new 9580 and 11825 (John Norfolk, OK and Chuck Albertson, WA, *DX Listening Digest*)

ANGUILLA University Network on 1610 kHz, page 54, May *MT*, is not a pirate, but the Caribbean Beacon carrying Dr. Gene Scott, also on KVOH 9785 and WWCR 7520 overnight; now he has bought the Caribbean Beacon "lock, stock and barrel," and plans to add shortwave on Anguilla, and eventually elsewhere in the world for 24-hour coverage (Roger Pettengill, *SW Echo* via Kirk Baxter)

AUSTRALIA VNG, the timesignal station, planned to move from 15000 to 16000 kHz, but stay on 5000 and 10000 (Dr. Marian Leiba, VNG, Radio Netherlands *Media Network*) Voice IDs are at 14, 29, 44 and 59 minutes after the hour (Bill Dvorak, WI)

Radio Australia announced the Navy Message Service airs Thursdays at 1430 on 15530, 21730, 25750 (*DXLD*)

BANGLADESH Radio Bangladesh, English at 1230-1300 announced on 15200 and 17750 but heard on 15605 or 15647 as engineer sees fit. Listeners' letters are read every Friday on *From Us to You* -- should be vice versa? (John Babbis, MD, *DXLD*)

BELGIUM BRT at 2200-2355 moved its South American frequency from 13675 to 13655, but kept North American on 13720 despite WRNO. Since WRNO has not been using that frequency every day, it may take a while for BRT to catch on (*DXLD*)

BRAZIL Radio Difusora do Maranhao is back on 4754.5 after a long absence, 24 hours (Antonio Ribeiro da Motta, Brazil, *DXLD*) Radio Relogio Federal, 4905 nominal, has been varying around 4919.5, heard after 2215 (Carlos Felipe da Silva & Rogildo Fontenelle Aragao, Brazil, *Play-DX*) ID at 0200 on 4919 (Hans Johnson, MD, *DXLD*)

BULGARIA Radio Sofia announced that *Calling Amateurs and DXers* airs toward the last part of these broadcasts: Fri. 1730, 2030, 2300; Sat. 0630; Mon. 1430, 1730; Wed. 2130, 2300; Thu. 0300. SWBC DX news was out of date and inaccurate, but also has ham news from ARRL, and said nets for Bulgarians abroad are Thu. at 1530 on 21203; Sat. and Sun. 1530 on 14137 (?) (John Norfolk, OK, *DXLD*)

CANADA Shortly after RCI was gutted, Director Andrew Simon was fired, replaced by program director Allan Familiant. He's the best hope for reviving RCI, if CBC keeps him on permanently (Larry Shewchuk, Winnipeg, *World of Radio*) Wojtek Gwiazda and fellow union members have been mounting a strong campaign as the Coalition to Restore Full RCI Funding, with pressure on the government, press conferences; shortwave listeners, especially Canadians at home and abroad with voting power, need to keep writing or faxing the Prime Minister. A cabinet shuffle resulted in new ministers of communications and external affairs, who might be more receptive, though still in the Mulroney government.

Meanwhile, some CBC replacement programs on RCI as scheduled and/or monitored, after news of varying lengths at hourtops: *The Arts Tonight*, Mon.-Fri. 2130 on 17820, 15150, 11880; Friday 0528 on 6150, 9750. *Media File*, Sat. 1800 on 17820, 15260; 2330 on 9755, 5960; UTC Sun. 0130 on 13720, 11940, 11845, 9755, 9535; Thu. 0528; Sat. 1500 on 21545, 17820, 15305. *Quirks & Quarks*, Sat. 2100 on 17875, 15325; UTC Sun. 0000 on 9755, 5960; 1800; 2300 on 15235, 11940. *Royal Canadian Air Farce*, Sat. 1900 on 21675, 17875, 15325, 13650; Sun. 2130 on 17820, 15150, 11880; 2200 on 13670, 9755, 5960; 0130 UTC Mon. as above. *Sunday Morning* repeats in the afternoon: hour one, 1900; hour two, 2100. *Double Exposure*, Sat. 1930; Sun. 2100 on 13650; 2300 on 13670, 11730, 9755; 2330 on 9755, 5960; Tue. 0528 on 6150, 9750. (*World of Radio*)

Deutsche Welle in German at 1400-1600 on 17830 is an RCI relay (Bill Westenhaver, *DXLD*) RCI's Mideast service at 0400-0430 sometimes shows on unlisted 15445, a satellite hop ahead of Austria on 15275 via Vienna, so perhaps Sackville (*W.O.R.*)

CHINA Radio Beijing is negotiating with U.S. stations, both east and west coast, about possible relay arrangements (Zhang Zhenhua, Vice-Director, RB *Messenger* via Bill Dvorak who queries: but which stations could they be -- they're all either government or godly)

COLOMBIA The mystery station on 5536 is Radio Ecos Especiales, all-religion, Protestant, perhaps connected with Family Radio; nominal 5535 at 1000-0400, location unknown but has box in Bogota (Manual Rodriguez Lanza, Venezuela, via Dario Monferini, *DXLD*)

Listeners in Santander Dept. must endure 30 minutes of 'black' propaganda by two stations around the same frequency: Radio Patria Libre, leftwing, and El Pueblo Responde, rightwing. RPL is anti-government, regularly airs speeches by Fr. Manual Perez; EPR condemns terrorism (*El Nuevo Siglo*, Bogota, via BBCM) They vary around 6315 at 0025-0120 and 0030-1220 (BBCM)

CONGO RTVC, Brazzaville, has news in English, at least weekdays, at 2230 on 4765 (Ari Riikonen, Finland, WDXC *Contact*)

COSTA RICA Radio for Peace International's new 13-m frequency turned out to be 21460 USB, unfortunately almost always suffering splatter by the much stronger HCJB USB on 21455! The same transmitter switched to 7375 around 0030, but weekends on AM instead to accommodate more musical programming. On one occasion, narrow-band FM was tried for *Music from Everywhere*, UTC Mon. 0400-0500. RFPI program times in May *Shortwave Guide* were one hour too early; see our column last month for how they should be even later now. RFPI did not suffer damage in the April 22 earthquake, then told how listeners could help with relief: fax the National Emergency Commission at 506-202054; or the Red Cross at 506-552678; or make a direct deposit to the NEC account at the Banco de Costa Rica, 147878-8 (*W.O.R.*)

All listed SW stations were still heard after the quake, including Radio Casino in Puerto Limon, 5953. 5 (Lou Josephs, MA, RN*MN*) The day after, we heard a quake report in Spanish on Radio Mundial Adventista, around 1330-1400, probably the strongest signal out of C.R., on 9725 (*W.O.R.*)

AWR--Latin America has purchased the site of the defunct Radio Impacto, at Cahuita, and plans to move there from present location with old transmitters, added to four of Impacto's, two of which are SW. Possible frequencies will be 5030, 5970, 6150, 9725, 11870, 13750, 15460--some 20 kW, some 50 kW (AWR *Current* via BBCM)

CUBA RHC has been testing reduced-carrier USB on 5965, in English at 0400-0600, reports wanted for special QSL. Possible low-power tests on the 7.3 and 25 MHz bands may come later this year (Arnie Coro, RHC *DXers Unlimited*)

(non) UTC Tuesday at 0300-0310 on 7340, I heard La Voz del CID with news in Russian, read by, I believe, Cuban man and woman, probably parallel 9940. Uncertain if this was a special or regular program (Tim Hendel, Miami, FL, *W.O.R.*)

CYPRUS Radiofonikon Idryma Kyprou still has external service in Greek to UK, Friday, Saturday and Sunday at 2215-2245 via BBC Zyyi 250 kW on 7205 (John Babbis, MD, *DXLD*)

ECUADOR When you write to HCJB, just include the words "Happy 60th Birthday," to enter a Christmas Day drawing for a free trip to Quito (*SW Magazine* via British DX Club)

HCJB heard at 0530 on 15050, 15071, 15092, 15113, 15134, 15145, 15155, 15165, 15176, 15197, 15218, 15239--all strong and ruining most of the band. HCJB is one of the worst air-pollutors, transmitters are defective, but nobody seems to care (Ernie Behr, Ont., NASWA *Journal*)

ETHIOPIA With rebels approaching the capital, Voice of Ethiopia was still very reliable, English at 1500-1600 on 7165, 9560 (Victor Goonetilleke, Sri Lanka, RN*MN*)

Voice of Ethiopia on the Path to Democracy, formerly known as EPRP Radio, hostile to the government, in Amharic on 7010, also announcing 49 metres, untraced, daily at 1530-1615, 0330-0415 (except Sundays 0400-0445) (BBCM)

FALKLAND ISLANDS (non) The BBC service to here is now Tuesdays and Fridays at 2130-2200 on 13660 (*London Calling*) Site is Rampisham, England (Bob Padula, *Australian DX News*)

FRANCE Radio France Internationale, complete English schedule: 1230-1300 to North America; 9805, 11670, 15155, 15195 to Europe; 1400-1500 on 21765 to SE Asia, 11910 and 17650 to India; 1600-1700 11705, 17620, 17795, 17850, 12015, 15530, 6175 to Africa, Indian Ocean, Mideast and Europe. Some features: *Club 9516*, Sunday on all. *Film Reel*, Fri. 1400 & 1600, Sat. 1230. *French Lesson*, Sat. 1400 & 1600. *Report on Asia*, Sat. 1400, Sun. 1600. *RFI Countdown*, Wed. 1400 & 1600. *Arts in France*, Thu. on all (Simson Najovits, RFI, *Review of International Broadcasting*)

GERMANY DW's DX program in English airs the first Sunday of the month instead of *Mailbag* (Vidjit Vijaysanker, UDXL *DX Post*) See last month for times, Saturday night here.

It may be complex to keep track of DW sites now that ex-RBI ones are integrated, except for Leipzig which has only one 100 kW transmitter, scheduled 0100-0750 on 13610, 0800-1430 on 21465 (Bob Padula, *Australian DX News*)

DW is negotiating with the USSR for spare transmitter usage 15 hours per day, costing $3.6 million for relays to Asia; some are former jammers probably used against DW itself (RN*MN*)

GUATEMALA Radio Kekchi on 4845, has a converted 5 kW mediumwave transmitter, now running only 1200 watts due to some problems, Mon.-Sat. 1100-1700, 2100-0300; Sunday, 1200-1500, 2100-0200. Has pennant, QSL, reports should be in Spanish with $1 return postage to TGVC, 16015 Fray Bartolome de las Casas, Depto. de Alta Verapaz (Ken MacHarg, HCJB *DX Partyline*)

HONG KONG BBC plans to close down its relay here in 1997, since China wants editorial control; may replace with new site in northern Thailand (*Sunday Telegraph*, via RN*MN*)

INDIA AIR Tibetan service is 0215-0230 on 15185, 11870; 1215-1345 on 9575, 7412 (via Scott Edwards and Kevin Klein *DXLD*)

First broadcast retimed to 0130-0200 on 9630, 11910 (Alok Dasgupta, *ADXN*) Second broadcast at 1215-1315 on 11715, which also carries weather for Himalayan mountain expeditions after news, at 1135-1143 (Craig Tyson, *ADXN*)

Air Kohima has raised power from 2 to 50 kW: 1315-1630 on 3268; 0025-0215, 0229-0400, 1000-1300 on 4850; 0630-0941 on 6065 (Manosij Guha, UDXL *DX Post*)

IRAN (non) Radio Iran Toilers, communist clandestine from Afghanistan, closed down in March after seven years (BBCM) But plenty of clandestines remain, including Voice of Sarbedaran ("those who have laid their heads on the block") of the Union of Iranian Communists, around 1730-1830 on 4207. And Voice of the Guerrillas, varying 4345-4375 around 0300-0400 and 1730-1830 (BBCM)

IRAQ Iraqi Radio's Kurdish service is on 7350.5, at 0125-2200. Arabic service at same times on 3980, 4600, 6540, 8350.3, 15600; includes Voice of the Peninsula & Arabian Gulf at 1630-1700; Holy Media Radio 1900-1930; Voice of Egypt of Arabism at 1930-2000 (BBCM)

(non) Voice of Free Iraq operates from the outskirts of Jidda, Saudi Arabia, run by Iraqi exiles and guarded by Saudis (Michael Wines, *NY Times*, via Greg Schmitz and Scott Edwards) One of chief managers is Ibrahim al-Zubaidi, former director of Baghdad Radio, who has lived in the US for some years. Another manager, Salah Omar Ali al-Tikriti, was involved in the Baath Party seizure of power in 1968, and played important role in public hanging of Jews and other Iraqis as spies in 1969; served as Minister of Info & Culture, and chief delegate to UN. Broadcasts are aimed at military establishment (Elaine Sciolino, *NY Times*, via Chuck Albertson & Scott Edwards) Name changed to Voice of the Iraqi Resistance, sometimes on 15600 with Baghdad on 15605, or vice versa (Hans Johnson, MD, *W.O.R.*) Or Voice of the Iraqi Opposition (BBCM)

ISRAEL Winning the out-of-band sweepstakes is Israel Radio's Arabic service on 15905, plus 15480, 15100, 12077, 11670, 9815, 7480, 5915, 5900 at 0300-2115 (BBCM)

ITALY AWR-Europe has applied for a high-power SW facility near Argenta, 8 antennas and 4 transmitters, two each 250 and 100 kW, to replace Forli, and via Sines, Portugal (AWR *Current* via Alan Farmer, WDXC *Contact*)

JAPAN One Radio Japan broadcast on which Ian McFarland is sometimes heard is the 1100-1200 on 6120 via Canada (Sheldon Harvey via Wojtek Gwiazda, *World of Radio*)

KASHMIR AZAD Azad Kashmir Radio has increased activity on 4790 and sounds higher-powered, 0045-0405, 1100-1810, heavy Islamic slant (Manosij Guha, India, RN*MN*)

KURDISTAN (non) Voice of Iraqi Kurdistan varies 5.5 to 5.9 MHz, bad audio, and is very elusive in the 16-18 UTC period (Richard Measham, BBCM, RN*MN*) Such as 5684, 5941; used to broadcast also at 0400-0500 (BBCM)

LAOS (non) Radio Station of the Government for the Liberation of the Lao Nation, was heard again, at 0725 on 10203 kHz (BBCM)

LIBERIA VOA is now off; its future is in the balance; severely damaged and looted last September by Taylor (RN*MN*) ELWA's antennas are intact, but buildings looted. ELBC, 7275, uses mobile studio (Lars Astrom, *Sweden Calling DXers*) Heard as early as 0706 now (Frank Orcutt, NY, *DXLD*) Comes on at 0650 (Robert Shepherd & Craig Seager, *ADXN*)

LIBYA A new service to Eastern Europe is on 17725, 1800-1915 or so, in Russian, Romanian, Hungarian, Polish, Bulgarian, Czech, Slovak, German, mostly reading Qaddafi's *Green Book* (P. Bruns, BRT *Radio World*)

LITHUANIA Radio Vilnius announced these programs in the 2300-2330 broadcast on 11770, 11860, 15180, 17690, 17720: Sunday, *Week in Review*, *Way We Live*, *Music*, *Listeners' Club* (last Sunday of month). Monday, *Around Lithuania*, alternating with *Nature Book*; *Feature for DXers*. Tuesday, *Topical Event*, *Letterbox*, *Sports*. Wednesday, *Interview* or *Commentary*, *Lith. Culture*. Thursday, *Topical*

Shortwave Broadcasting

Issue, Press Review, Letterbox. Friday, *History of Lith., Sports.* Saturday, *Living in Vilnius, Concert of Lith. Music* (Brian Goslow, MA)

Lithuanian DX Club "Banga," which produces Radio Vilnius DX programs, needs to get a photocopier to expedite publication; would like to buy IRCs. They also sell tapes, publications, equipment; send one IRC for catalog to Sigitas Zilionis, LDXC Chairman, A.d. 1646, 232010 Vilnius, Lithuania (via Kevin Klein, WI, *DXLD*)

NAMIBIA I am very sorry to report that longtime *Media Network* and *WRTH* contributor Richard Ginbey lost his life in a tragic car accident. He was also a professional broadcaster at Radio Bophuthatswana and until his death at NBC as senior announcer. He was 47 (Andy Sennitt, *SW Echo* via Kirk Baxter)

NETHERLANDS RN made a last-minute change to its Pacific services, which also wiped out the 1030 UTC broadcast which was convenient for EDT morning listeners. Now 55-minute transmissions are at 0730 on 9630, 9715; 0830 on 9630; 0930 on 11895, all via Bonaire (*W.O.R.*)

NEW ZEALAND ZLXA, 3935, expanded to six days a week: Sun. 0600-0900, Mon.-Fri. 0630-1000. Reports have been received from North America (Arthur Cushen, RNZI *Mailbox*)

NORWAY Many transmissions are on compatible USB, including these Radio Denmark to North America in Danish: 1230 on 21705, 1430 on 17790, 1530 on 17790, 1630 on 17755, 1730 on 17760, 1830 on 17755, 2330 on 17755 (via Erik Koie, DSWCI *SW News*)

PALESTINE (non) Voice of the Palestinian Islamic Revolution, daily 1900-1930 in Arabic on 9610, which is also used by V of the Islamic Republic of Iran (BBCM, which heads this "country" as WEST BANK & GAZA)

PAPUA NEW GUINEA Radio North Solomons was reactivated on 3325, but now from an extra transmitter at Rabaul, New Britain (Gordon Darling, PNG, via *Oz DX* and John Bryant, OK) The 3325 transmitter blew up and won't be back for some weeks (Andy Sennitt via SW Possums via Michael Rolph, *ADXN*)

PARAGUAY Radio Guarani has a new owner which has upgraded MW 737, and plans eventually to reactivate SW 15210 (Ledi Iversen, Norway, RN *Radio-Enlace*)

PERU Radio Atalaya is a new station in Atalaya, Ucayali, on 5311 varying to 5313, sign/off varying 0210 to 0315 (Rafael Rojas and Pedro F. Arrunategui, Lima, via Dario Monferini) Also new is Radio Santa Monica, 6669v, in Santa Monica, Santiago de Chuco, La Libertad, 1100-2300, extended to 0220 UTC Monday (*ibid.*) Celendin has four out-of-band 4 MHz outlets: 4485, La Voz de Celendin; 4461, Radio Norandina; 4139v, Radio Gran Pajaten going past 0330 announcing 3810; and 4495, Radio Pajaten at 0150, not Radio San Mateo (Rafael Rojas via Monferini, *DXLD*)

SEYCHELLES FEBA has resumed a morning broadcast in English to Mideast, 0432-0502 on 17810. Also has Tibetan at 1215-1230 on 15445 (*DXLD*)

SPAIN Radio Exterior broadcasts 21535 hours per year in languages of Spain, 6570 in others; staff of over 300 works about 350,000 hours per year; Arganda transmitter site of five 100 kW transmitters covers about 553,000 square meters; Noblejas, 6 x 350 kW, and 29 antennas, covers 144,000 m^2; total power 2600 kW (REE via *DXLD*)

SWAZILAND TWR in English: 0430-0500 on 5055; 0430-0530 on 9655; 0430-0700 on 5965; 0430-0835 on 11750; 0600-0835 on 7200; 0835-0850 Mon.-Fri. on 11750 & 7200; 1600-1700 on 9600; 1700-1730 on 9520; 1700-2100 on 3200; 1800-1845 on 9600; 1900-2115 on 3240 (BBCM)

TADJIKISTAN SSR MinCom says only SW site is Yangi-Yul', 4635 for Republican Pgm I, 7245 for Pgm II (Valery N. Ostroverkh, Kazakhstan via Bruce MacGibbon, *DXLD*)

TANZANIA Dar Es Salaam very strong on 7280 until closing at 2102, clear until VOA opens at 2058 (Bob Padula and Craig Seager, *ADXN*)

UKOGBANI (non) Radio Fax is back on 6205 with nonstop pop music tests from Surrey Electronics, heard in Scotland and Holland, 230 watts; also will use 12255 with 250 watts for North America. Claims now to broadcast from a country where it is legal (RN*MN*)

UNITED ARAB EMIRATES After schedule variations for the war and Ramadan, Voice of the UAE, Abu Dhabi shows English to North America at 2200-2400 on 11965 (via Bill Wilkins, UT, *DXLD*)

USA *World of Radio* on WWCR, 15690: Friday 2115, Saturday 2330, Monday 1800. Contrary to May *MT*, page 98, WWCR's address is now: 4647 Old Hyde's Ferry Pike, Nashville, TN 37218.

Radio Newyork International left WRNO after one month due to the expense; continues via WWCR 7520, UTC Mondays 0100-0500 (*W.O.R.*) Besides Mexico on 6185, Belgium on 13720, WRNO also has Radio Moscow World Service to cope with on 15420.

Due to DST in China, VOA's Tibetan service shifted to 0130-0145; 15430 was jammed, and this shifted to 15290, along with 17705 and 21570 all via Philippines (Tetsuya Kondo, Radio Japan *DX Corner*) The service has a staff of five, but recruiting more in order to expand to one hour in morning, one hour in evening (Kim Andrew Elliott, VOA, RJ *DX Corner*) VOA has a Farsi service in the middle of the Iranian night, 2300-2330 UTC on 6180, 7110, 9670. VOA-Europe is now on SW only at 0800-1000 on 11740, 15160, 15195, 21570, 21615. Radio Marti has a silent period UTC Mondays at 0300-0930 (via E. Allen Brown, VOA via Kirk Baxter, ANARC BBS via *SW Echo* via Kirk Baxter via *DXLD*)

Though Bethany is still around, it no longer has a post office; the VOA relay might better be called West Chester, or even Kingsgate today, but no telling how many millions of dollars it would cost taxpayers to change the name (Mark Meece, N8ICW, *SW Echo* via Kirk Baxter)

Sunrise is a good time to check for MW harmonics; on 2800 after 1200 UTC, heard KBYG, K-Big Country, Big Spring, TX, 2 x 1400 kHz (gh, *W.O.R.*)

USSR Detailis of the timezone shifts: no additional DST this summer in most of the country, except: clocks put one hour forward in Georgia, Latvia, Lithuania, Moldova, Estonia; Komi ASSR; Kaliningrad Oblast; Nenetsk Autonomous Okrug. Clocks put one hour *back* in Kazakh SSR (except Ural'sk Oblast), Kyrgyzstan, Tajik SSR; and these Uzbek Oblasts: Andizhan, Dzhiza, Namangan, Syr-Darya, Tashkent, Fergana. When summer time period ends Sept. 29, clocks to be put one hour back in USSR, except Kazakhstan, Kirghizia, Uzbekistan, Turkmenia, Tajikistan (*Izvestia* via BBCM) Now, is that clear?

VATICAN Many English broadcasts retimed, including to North America--merged into one at 0250 on 7305 and 9615 (Vatican Radio via *W.O.R.*) Actually on 11620, not 7305 (Joe Hanlon, PA)

VENEZUELA Radio Nacional's international service runs Monday-Saturday in one-hour blocks on 9540 as in May *SWBC* column, but containing 25 minutes of Spanish, 20 of English, 10 of French, 5 of Creole (Manual Rodriguz Lanza, Caracas, WRTH *LA-News* via *Radio Nuevo Mundo*)

YUGOSLAVIA Radio Yugoslavia's 1200-1230 broadcast, at its DST timing, is again on 17740 for North America; 17725 and 21600 for elsewhere (*World of Radio*)

Broadcast Loggings

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

0000 UTC on 11920
MOROCCO: RTV-Marocaine. French. African and classic tunes to announcer ID. Arabic programming observed with fair signal quality at 1910 UTC on 15330 kHz, and 2100 UTC on 15105 UTC. (Cavenaugh, LA)

0032 UTC on 9835
HUNGARY: Radio Budapest. English ID into Hungarian music program. News and sports on 11910 kHz at 0137 UTC. (Carson, OK) DX program on 6110 kHz at 0230 UTC. (Melnick, MA)

0045 UTC on 11680
BULGARIA: Radio Sofia. "Across the Map Of Bulgaria," a tour of Bravnia. Parallel programming noted on 9700 kHz. (Fraser, MA) Audible on 9700/7115 kHz at 0430 UTC. "Answering Your Letters" and Bulgarian folk music on 7115 kHz at 0440 UTC. (Carson, OK)

0050 UTC on 9605
VATICAN STATE: Vatican Radio. Station ID and program "The Church In theWorld." Continued programming on "The Vatican Summit" and frequency schedule. ID and sign-off at 0108 UTC. (Bailey, AR)

0110 UTC on 9575
ITALY: RAI. News item on a movie studio near Rome to be auctioned off. Parallel frequency 11800 kHz noted. (Fraser, MA)

0143 UTC on 7400
USSR: Radio Peace and Progress. Commentary in progress at tune-in. Folkmusic, ID, and "Press Review." Ecology report on teaching children about environmental protections. (Melnick, MA)

0200 UTC on 4910.4
HONDURAS: La Voz Evangelica de la Mosquitia. Spanish. Tune-in at the hour, with fired up evangelist delivering a sermon. Fair signal quality. Recheck at 0330 revealed La Voz Evangelica on 4820 kHz, gospel vocals and continuing religious format. (Wright, MS)

0208 UTC on 4980
VENEZUELA: Ecos del Torbes. Spanish. Venezuelan style music to local commercials Radio Continental present at this hour on 4939.6 kHz, as well as La Vox del Tigre on 3254 with fair-poor signal quality.

0220 UTC on 4915
BRAZIL: Radio Anhanguera. Portuguese. Still working the Latins tonight. Brazilian stations aplenty. Lively pop vocals and two station promos. Others noted at this hour were, Educacao Rural on 4755, Brazil Tropical 5015, and Cacao Nova on 4825 kHz. (Wright, MS) *Looks like Sam is becoming the Latin expert for us.-ed.*

0227 UTC on 7520
USA: WWCR-New York International. '60s era pop rock tunes. Station ID and ongoing Persian Gulf discussion. Dateline news with Randy Slade. (Melick, MA) Pirate Radio Part 2 special. (Carson, OK)

0230 UTC on 9705
PORTUGAL: Radio Portugal. News and program on philately. Station ID with excellent signal. Sign-off at 0300 with ID and frequency schedule. Observed on parallel 9600 kHz with fair to poor quality. (Ferndale, MI)

0300 UTC on 6085
GERMANY: Deutsche Welle. Station identification and world news. News from Iraq and Jordan monitored to 0332 UTC. (Bailey, AR)

0335 UTC on 7255
BOTSWANA: Radio Botswana. Setswana. African highlife music in progress. Station ID and programming announcements. Weak signal audible on 4830 at 0620 UTC. (Marshall, OH)

0343 UTC on 9695
SWEDEN: Radio Sweden. Report on cross country skiing and ski jumping. Jazz music program followed. (Carson, OK) Monitored sign-on at 0200 UTC on 11705 kHz. National economy report and "Mailbag" show at 0230 UTC. (Allen, PA)

0352 UTC on 11910
SOUTH AFRICA: Radio RSA. Interval signal and sign-on at 0359 UTC. English service announcements, and national anthem. World news with fair signal quality. (Carson, OK)

0400 UTC on 4800
LESOTHO: Lesotho National Broadcasting Service. Sesotho/English. International news topics to multilingual IDs. Gospel music to presumed religious text. (Wright, MS)

0400 UTC on 9535
NETHERLANDS ANTILLES: Trans World Radio-Bonaire. Station ID to radiodrama "Character Spotlight." Drama dealt with Nehemiah who was a servant of the King of Persia. Program monitored to sign-off at 0430 UTC. (Bailey, AR) (Carson, OK)

0400 UTC on 17770
NEW ZEALAND: Radio New Zealand International. News on the Middle East in depth. Interesting news on Fiji's army commander not seeking political office. Easy-listening music monitored to 0425 UTC. (Bailey, AR) International news, sports, and discussion with aboriginal hunters. (Carson, OK)

0405 UTC on 7235
MALTA: Deutsche Welle relay. Arabic. Station ID and Arabic music. International news at 0415 UTC. (Carson, OK)

0535 UTC on 7255
NIGERIA: Voice of Nigeria. Newscast and press review at 0541 UTC. Sports report and ID, with fair signal quality. (Carson, OK)

0557 UTC on 14917
KIRIBATI: Radio Kiribati. Station ID at sign-on into BBC news relay. South Pacific news briefs and one local news item on tourism. Signal stable at 0745 UTC recheck with island music. Audible on two consecutive nights of monitoring. (Bagwell, MO)

1600 UTC on 6150
COLOMBIA: Caracol-Bogota. Spanish. Latin pop and traditional vocals. Caracol network promo, time check, items on Bogota, and ID. La Voz del Llano audible at this hour on 6115 kHz with similar programming and music feature. (Wright, MS)

0621 UTC on 3365
CUBA: Radio Rebelde. Spanish. Rumba music program into news at 0630 UTC. Editorial on Iraq. (Carson, OK)

0630 UTC on 9675
POLAND: Radio Polonia. National Polish news to 0640 UTc. ID and "Postbag"show. Poor signal and considerable interference. (Carson, OK) Additional monitoring with fair quality, at 2235 UTC on 7270 kHz. (Allan, PA)

0640 UTC on 5047
TOGO: RTV Togolaise. African tunes amid fair signal quality and occasional interference. Local news and station ID. (A.K., TX)

0800 UTC on 4890
PAPUA NEW GUINEA: National Broadcasting Corporation. Pidgin. NBC ID at the hour with local announcements. Island and lite pop tunes. Radio Ireland also audible on 3905, however, suffering interference from ham radio operators. (Roshelli, CA)

1442 UTC on 17575
MADAGASCAR: Radio Netherlands. Media Network on European TV developments. (Carson, OK) Additional monitoring on 15150 kHz at 1430 UTC. (Jefferson, KY)

1530 UTC on 9560
ETHIOPIA: Voice of Ethiopia. Time check and ID at the half-hour into world news. Fair signal quality throughout. (Garcia, PA)

1900 UTC on 11935
SAUDI ARABIA: B.S.K.S.A. Arabic. Station ID as "Arabiya al-Saudiyah," followed by news topics from the Middle East. Additional check on 9705 kHz at 2055 UTC noted Arabic music. Fair signal continued for English sign-off ID and national anthem at 2100 UTC. (Bagwell, MO)

2030 UTC on 9895
NETHERLANDS: Radio Netherlands. "Happy Station" program and ID. (Fraser, MA) Interval signal, sign-on and news on 6020/15560 kHz at 0027 UTC. Additional check at 0050 UTC on 6020 kHz. (Carson, OK)

2045 UTC on 11850
CYPRUS: BBC relay. "Counterpoint," a musical quiz program. (Fraser, MA) Sign-on at 2215 UTC on 9555 kHz with Greek programming. (Wright, MS)

2110 UTC on 21660
ASCENSION ISLANDS: BBC relay. Rugby League report and sport round up on skiing. Sign-off at 2114 UTC. (Carson, OK) Additional monitoring on 6005 kHz at 2100 UTC. (Wright, MS)

2123 UTC on 12085
SYRIA: Radio Damascus. News on continued strifes in Iraq, followed by news and views on the refugees' plight. Subsequent check on same frequency at 2218 UTC noted Arabic music, news and ID. (Carson, OK)

2130 UTC on 17820
CANADA: Radio Canada International. World and national news to sports report, and "Listener's Corner." Sign-on at 2300 UTC on 11730 with news and sports. Sign-off at 2330 UTC. "Double Exposure" on 5960 kHz at 0034 UTC. (Carson, OK) (Wright, MS) *No more.-ed.*

2155 UTC on 9900
EGYPT: Radio Cairo. "Mailbag" program and news headlines at 2215 UTC. Continued programming on Islamic literature. (Lesman, NJ)

2201 UTC on 11620
INDIA: All India Radio. News in progress at tune-in. National and world news on Israel, Somalia, South Africa, and Asia. Fair signal quality for Indian sitar music. ID, frequency schedule, and sign-off at 2230 UTC. (Melnick, MA)

2205 UTC on 5025
BENIN: ORTB-Parakou. French. African style tunes to DJ chat. Presumed radio type drama to music and announcements. Station ID and sign-off routine at 2255 UTC. (Westbrook, OH)

2214 UTC on 4770
NIGERIA: Radio Nigeria. Program "Perspective" and easy-listening music. Station ID and news summary at 2215 UTC. Station sign-off at 2300 UTC with frequency schedule. (Price, PA)

2220 UTC on 4750
CAMEROON: CRTV-Bertoua. French. Music mix of African highlife and French Afro pops. Announcer chats to ID, national anthem and sign-off at 2235. (A.K., TX)

2250 UTC on 3366
GHANA: Ghana Broadcasting Corporation. Vernaculars/English. National news to 2300 ID, followed by native vernacular comments. English programming at 0600 UTC on 4915 kHz with local news and weather. (Cavanaugh, LA)

2255 UTC on 15139.4
COLOMBIA: Radio Nacional de Chile. Spanish. Station promotional to local commercials for cola, beer, and camera film. Program chat and time check. (Kegley, OR)

2300 UTC on 7400
USSR: Lithuanian SSR-Radio Vilnius. National news to folk music. Commentary on Soviet human rights and violations. Closing music at 2327 UTC and sign-off. (Melnick, MA) (Carson, OK)

2320 UTC on 4810
SOUTH AFRICA: Radio Orion, English/Afrikkans. IDs and weather for the Johannesburg area. Phone-in request show at 2309 UTC. Excellent reception quality (Price, PA)

Utility World

Larry Van Horn
c/o MT, P.O. Box 98
Brasstown, NC 28902

Maritime Listening from Across the Pond

A lot of utility listeners enjoy monitoring the marine bands for coastal and ship activity. It is not often that we here in the U.S get a good look at what is going on overseas, but this month Bill Kiely, across the pond in Ireland, gives us a look at some marine band frequencies from the Land of Shamrocks.

The following is a list of maritime radio stations and frequencies used in Ireland. As always in this column, the frequencies are in kilohertz (kHz).

Valentia Radio
Callsign: EJK Position: 51.56N/010.21W

Coastal Transmit/ Ship Receive	Coastal Receive/ Ship Transmit
1827 2182	2049* 2182
2590 2614	

* Watches on 2049 and replies on 1827 when 2182 is engaged in a distress operation.
Traffic lists are transmitted on 1827 at 0333 and every odd hour (H+33) between the hours of 0733 and 2333. A traffic list is broadcast by a coastal station to announce which ships the coastal station is holding message or phone patch traffic for.

Malin Head Radio Callsign: EJM Position: 55.22N/007.21W

Coastal Transmit/ Ship Receive	Coastal Receive/ Ship Transmit
1841 2182	2049** 2182
2593	

** Watches on 2049 and replies on 1841 when 2182 is engaged in a distress operation. Traffic lists on 1841 are broadcast at 0103, 0503 and every odd hour (H+03) between the hours of 0903 and 2303.

Bill has also included a list of marine channel designators for maritime stations in the United Kingdom. Frequencies marked with a '?' are reserved and only used when other channels are busy. He has included the position of each station for those of you who may not know their location.

Bill mentions that the call signs he has included with each station list are never used over the air. Watch for the operators to use "Wick Radio," "Stonehaven Radio," and so forth.

Wick Radio
Callsign: GKR Position: 58/26N 003/06W

Coastal Transmit/ Ship Receive	Coastal Receive/ Ship Transmit	Channel
1824? 2751	2006	A
2840.6	2277	B
3538	3335	C
	3328	D
1792? 2705	2524	E
1827	2548	F
2604	2013	G
2625	2381	H

Stonehaven Radio
Callsign: GND Position: 56/57N 002/13W

Coastal Transmit/ Ship Receive	Coastal Receive/ Ship Transmit	Channel
2691? 1856	2555	I
1715	2552	J
1946	2566	K
2779	2146	L
3617	3249	M

Cullercoats Radio
Callsign: GCC Position: 55/04N 001/28W

Coastal Transmit/ Ship Receive	Coastal Receive/ Ship Transmit	Channel
2719? 1838	2527	N
2828	1953	O
3750	2559	P

Humber Radio
Callsign: GKZ Position: 53/20N 000/17E

Coastal Transmit/ Ship Receive	Coastal Receive/ Ship Transmit	Channel
1869? 1925	2569	Q
2684	2111	R
2810	2562	S

North Foreland Radio
Callsign: GNF Position: 51/22N 001/25E

Coastal Transmit/ Ship Receive	Coastal Receive/ Ship Transmit	Channel
1848? 2698	2016	T

Niton Radio
Callsign: GNI Position: 50.35N/001.18W

Coastal Transmit/ Ship Receive	Coastal Receive/ Ship Transmit	Channel
1834? 2628	2009	U
2810	2562	V

Land's End Radio
Callsign: GLD Position:

Coastal Transmit/ Ship Receive	Coastal Receive/ Ship Transmit	Channel
2670? 2782	2002	W
3610	2120	X

Portpatrick Radio
Callsign: GPK Position: 54.51N/005.07W

Coastal Transmit/ Ship Receive	Coastal Receive/ Ship Transmit	Channel
1883? 2607	2104	Y

Hebrides Radio
Callsign: GHD Position: 58.14N/007.02W

Coastal Transmit/ Ship Receive	Coastal Receive/ Ship Transmit	Channel
1866	2534	Z

The following callsigns are for different naval radio stations in Turkey, Greece, Netherlands and Norway. Bill sends hopes they will be of use to some of Utility World readers.

TURKEY	NORWAY
TBA/B = Ankara	LBA/JWT=Stavanger
TBC = Istanbul	LBC = Horten
TBD = Bartin	LBG = Bergen
TBK = Eregli	LBH = Trondheim
TBH = Golcuk	LBJ/JXU=Bodo
TBG = Canakkale	JWA = Kristinstad
TBO = Izmir	JWE = Tromso
TBN = Iskendderum	JWG = Harstad
	JWH = Lodingen

GREECE
SXA = Athens
SXB = Patras
SXC = Thessaloniki
SXD = Piraeus
SXH = Crete
SXK = Corfu

DUTCH
PBA3 = Amsterdam
PBB3 = Den Helgen
PBG3 = Walderen
PBU3 = Hook Van Holland

I would like to thank Bill Kiely for that interesting look at marine/naval radio stations in the United Kingdom.

MARS AMTOR Up and Running

Jack Gray says that the Navy MARS system is using AMTOR message mailboxes (AMTOR is an error correcting RTTY mode.) Basically the system works like this. Let's say the USS Neversail has a couple of personal messages from the crew to their families. The ship can forward, via AMTOR, a message to the mailbox via a radio here stateside. Once in the mailbox the messages can then be picked up by stateside stations for further transfer to the message destinations.

The same can hold true for a ship that has messages waiting on the mailbox. The mailbox will alert the MARS operator on the ship that mail is waiting for them. All he has to do is to request the mail and once he has captured it, print the message up for that member of the crew and deliver it.

The Navy MARS system now has the "ANTS" net (Afloat Net Traffic System). The mailboxes can be brought up at anytime. I would imagine that some of this system probably uses packet as well and, in fact, I have noticed an increased amount of packet activity on MARS frequencies lately. Navy MARS afloat director NNN0PPE in Virginia states that he has been installing quite a few mailbox systems country-wide (latest in Hawaii).

The frequencies given for the mailboxes are as follows:
14934.0 Mailboxes NNIK, NMBO
16173.0 Mailbox NZLS

All three of the above mailboxes are located on the East Coast of the United States.

Remember, if you want to check the phone patch afloat network, a good place to start is on the afloat calling channels. Once a ship gets a shore station hooked up, they usually announce the frequencies they are going to move off to for the phone patch (basically a telephone call via radio).

The two major calling frequencies to watch are 14441.5 (late morning to afternoons local time) and 20936.0 (early to late mornings local time).

Other frequencies to check for Navy MARS afloat activity:
13826.0 13974.0 (Antarctica activity) 14463.5 14467.0 14470.0 14477.0 14483.5 14818.5

A big Ute World thank you to Jack for the info and as always a tip of the old combo hat to all the men and women of the Navy MARS system for the fine work they do. I am a firm believer in the system as I have enjoyed it during my many years in Uncle Sam's finest service.

Speaking of Chiefs (my combo hat of course), Ed Flynn asked me which service has the greatest number of Warrant Officers. The ARMY, of course. He says that W-1 are called 'Mister' and W-2,3,4 are called 'Chiefs'. Boy oh boy, would I like to be a Chief there for the pay.

Ed also asks what has happened to the Raspberry net? Good question Ed. I check it for time to time and don't hear too much there.

For those of you who might not be familiar with this Navy net, 6723 is the universal air-to-ground channel in the Navy and you use to be able to hear a lot of Navy Airdale (Aviation) activity on that frequency. The Naval Air Station used to ID with Raspberry followed by the name of the naval air station (i.e. Raspberry Corpus Christi, etc).

I haven't heard much activity on 6723 recently, but Ed, it is still listed in the DOD Flip pubs for a lot of naval air stations around the country. Anybody else have anything?

Callsigns and More Callsigns

An anonymous contributor saw Bill Battle's Bolero Whiskey log in the April issue and wanted to pass along the following information. I would personally like to thank whoever sent it; you have cleared up a lot and have also helped Gayle's callsign book out a bunch.

Callsign	Location	ICAO ID
Bolero Whiskey/ Necessity Whiskey	Zaragoza AB, Spain	LEZA
Full House/ Hero Creek	Torrejon AB, Spain	LETO
Necessity Zulu	Ramstein AB, Germany	EDAR
Necessity Uniform	Upper Heyford, England	EGUA
Necessity Alpha	Rheinmain AB, Germany	EDAF

LEZA 14535 11270 11150
LETO 15757 10255 7713
EDAR 13215 8970 6723
(Interesting, see my Raspberry comment above)
EGUA 11258.5
EDAF 12117.5 8970 5460 4500
OEDR 13201 (Boater Alpha)

Aerostats Flying High on Low Frequencies

Contributor Dave Wilson received this interesting transmission from KS2XAL at the TCOM LTA (Lighter Than Air) facility in Elizabeth City, NC. The message was broadcast on 56 kHz between 1800-1900.

"Tethered Aerostat Antenna Program (TAAP) ... Since 1980, the DOD has promoted the development of a tethered aerostat system as a transportable VLF antenna. Several government-funded study programs have supported the STARS system as a means to quickly restore communications in emergency situations ... TCOM has assembled a VLF demonstration system using a STARS aerostat for operation at a 900-meter altitude. A special kevlar tether, designed and built for TAAP, functions as a strength member, a power conductor, a telemetry link and an antenna for VLF broadcasting.

"The complete TAAP system is transportable on four 12-meter trailers and can be put into broadcast service within approximately 6 hours after arriving at a site. The system consists of an aerostat, tether/antenna and mooring system, all contained on one trailer, a support vehicle that supplies system power and includes the operations office, the VLF transmitter vehicle and a helium supply trailer ... Extensive testing with very encouraging results was performed with the system at TCOMS Elizabeth City location. During this time TAAP participated in a world-wide communications test very successfully.

"Part of the system's ability to be made operational rapidly is its innovative ground plane approach. Due to the long antenna length (3,000 feet) a much less extensive groundplane can be used compared to more conventional shorter length antennas ... The system used to transmit this message is the same TAAP system used for the demonstration described above. End of Message."

Tune in next month to find out what we have in store for you utility listeners at the October *Monitoring Times* Convention in Knoxville. I hope you have made plans to attend. Gayle, our son Loyd, and I will be there. How 'bout you?

Utility World

Utility Loggings

Abbreviations used in this column

All times UTC, frequencies in kilohertz. All voice transmissions are English unless otherwise noted.

ACC	Air Control Center	MSK	Multi shift keying
Aero	Aeronautical	NATO	North Atlantic Treaty Organization
AFB	Air Force Base	NCS	Net Control Station
AM	Amplitude Modulation	QRM	Interference
B-52	SAC Bomber Aircraft	QSY	Change frequency
BT	Break signal in CW	SAC	Strategic Air Command (USAF)
CAP	Civil Air Patrol	SITOR-A	Error correcting RTTY mode
C-130	MAC Transport Aircraft	TACAMO	Take Charge and Move Out Aircraft (USN)
Comms	Communications	Unid	Unidentified
COMSTA	Communication Station	USAF	United States Air Force
CP	Command Post	USB	Upper Sideband
CQ	General call for any station	USN	United States Navy
CW	Morse Code	UTC	Universal Time Coordinated
EC-135	SAC Command Aircraft	VHF	Very High Frequency
F-16	USAF Fighter aircraft	VOLMET	Aviation voice taped weather station
FSK	Frequency Shift Keying		
HF	High Frequency		
ID	Identification		
KC-135	SAC Tanker Aircraft		
kHz	Kilohertz		
MAC	Military Airlift Command (USAF)		

22.3 NWC-Exmouth COMSTA, Australia (USN) with encrypted MSK traffic at 0130. (Waters-Australia)

44.0 VHB-Royal Australian Naval, Canberra with encrypted FSK traffic at 0124. (Waters-Australia)

474.0 DAN-Norrdeich Radio. Germany with CW traffic list at 2133. (Bill Kiely-Ireland)

2340.0 Tango 50/69 and other station with tactical communications and some scrambled communications in USB at 0432. (Fernandez-MA)

2625.0 GKR-Wick Radio, Scotland with USB telephone traffic. (Dunnett-UK)

2749.0 Canadian Coast Guard-Halifax, NS with an offshore weather broadcast ending at 0610 in USB. (Fernandez-MA)

3476.0 Santa Maria ACC, Azores working Speedbird 360 with position reports at 0508 in USB. (Fernandez-MA)

4227.0 SXA-Greek Naval Radio Pireaus with V CW marker for NATO broadcast K13A/G at 2100. (Dunnett-UK)

4506.0 Several Bluebird units opening Missouri CAP wing net at 0001 in USB. Also North Central 4 working Corn State 4 at 2355. (Symington-OH)

4627.0 Sooner 35 working other Oklahoma CAP units in USB at 0025. Eagle Nest 1329 working other Texas CAP at 0025. Magnolia 30 NCS working other Louisiana CAP wing units at 0100.(Symington-OH)

4728.0 Russian ACC with female operator working unid aircraft at 0530 with what appeared to be flight data exchanges with several aircraft in Russian. (Fernandez-MA)

5253.0 Possible spanish military comms in USB at 0645. (Fernandez-MA)

5793.0 Spanish female 5-digit number station in AM at 0641. (Fernandez-CA)

6240.0 Spanish female 5-digit number station in AM at 0500. (Harwood-CA)

6358.5 DHS-Ruegen Radio, Germany with V CW marker at 2356. (Dix-NY)

6646.0 Two station using alphanumeric call signs and using Navy terms (i.e.-Nuko, etc) at 0505 in USB. (Fernandez-MA)

6761.0 Lazer 53 (B-52 from Carswell AFB) working Silky 95 (KC-135) at 0340, told to switch to VHF using USB. (Harwood-CA) *SAC freq S-391-Larry*
Agar 31 working Rescamp with phone patch to Autovon 472-2671 (K.I. Sawyer). Call sign at K.I. Sawyer was "Crest Control" in USB at 0409. (Battles-NH)

6784.0 English female 3/2digit number station in AM at 0236. (Penson-MN)

6809.0 "Babbling Brook" tones off at 0100 like someone pulled the plug. *(This is the running water signal we discussed at last year's convention in Knoxville-Larry.)*Also noted a Foghorn here. Heard 3 second burst about 0316 with last burst at 0337 then short tone 15 seconds later. At 0338 Spanish male with brief 10 second announcement, "If I only knew spanish!!!" Operator was 1 kHz up but I am sure he was related as tuning the foghorn is difficult to tune in accurately. I have collected some data to play with and will let the readers know if I find out anything.(Penson-MN) *Thanks and I hope you keep us posted. Interesting break through on the foghorn-Larry.*

6813.0 More "Babbling Brook" tones then off at 0146. (Penson-MN)

6840.0 Spanish female 4-digit number station in AM at 0230. (Penson-MN)

6854.0 At 0248 noted a slightly irregular series of "dings" like sounds interwoven with a hiss or buzz. The ding components consists of two separate dings about 1 kHz. apart. (Penson-MN) *You win the unusual logging of the month award-Larry.*

7421.0 COMSTA Miami requesting unknown station to QSY to 3 alpha 8 due to QRM on frequency. In USB at 0330 and QRM was a Spanish female number station. (Harwood-CA)

7422.0 Foxtrot/Bravo Whiskey/Echo doing radio checks in USB at 0230. (Harwood-CA)

7433.0 Unid aircraft with phone patch through Stockholm, said over Rome enroute Bahrain. (Larry Williams-Greenville, SC) *Interesting Larry, I have nothing in my database-Larry.*

7493.0 NNNOCWG-USS Peleliu with phone patch traffic. (Symington-OH) *USN MARS-Larry*

7725.0 Spanish female 4-digit number station in AM at 1040 (Tuesday UTC). (HS-CA)

7780.0 Spanish female 5-digit number station in AM at 0033 (Wednesday UTC). (HS-CA)

7887.0 Spanish male 5-digit number in AM at 0813 (Friday UTC). (HS-CA)

8127.0 CIO2-Israeli Mossad number station heard at 1945. (Dix-NY)

8136.0 Spanish female number station in AM at 0943 (Monday UTC). (HS-CA)

8186.0 Spanish female 5-digit number station in AM at 1009 (Tuesday UTC). Spanish female 5-digit number station in AM at 0804 (Sunday UTC). (HS-CA)

8441.0 9YL-North Post Radio, Trinidad with a CQ CW marker at 2136. (Dix-NY)

8472.0 TEC-Puntarenas (Ocean) Radio, Costa Rica with CQ CW marker at 1136. (Dix-NY)

8548.0 DZF-Bacoor Radio, Manila, Philippines with CQ CW marker at 1143. (Dix-NY)

8606.0 RXW14-Unid Station repeating "RXW14 BT BT BT" at 0221 in CW. (Dix-NY)

8608.5 DHS-Ruegen Radio, Germany with V CW marker at 1154. (Dix-NY)

8631.6 9MR-Singapore calling RMMJ using 850/75 RTTY at 2012. (Waters-Australia)

8705.0 DHS-Ruegen Radio, Germany with CW call sign only marker and SITOR A idler at 1937. (Dix-NY)

8778.0 Foxtrot working Alpha 4 Romeo in USB at 1805. (HS-CA)

8861.0 SAL (Cape Verde Islands) ACC working Canarias in Spanish in USB at 2150. (Kiely-Ireland)

8930.0 Stockholm Radio working Emory 990 trying to establish comms. Aircraft over Spain, switched to 5541.0, other aircraft sent to 11345.0 in USB at 0240. (Fernandez-MA)

9027.0 Royal Air Force Dunedin, New Zealand working various aircraft at 0934 in USB. (Waters-Australia)

9040.0 German female 3/2-digit number station in AM at 0235. (Fernandez-MA)

9130.0 Female English 3/2-digit number station in AM at 2310. (Hosegood-UK) *Welcome to the column-Larry.*

9187.3 FYJ8-French Dipio Paris, France with French news using 425/50 RTTY at 0653. (Waters-Australia)

9189.5 RDZ75-Moscow Meteo, USSR with RTTY 1000/50 weather info at 0809. (Waters-Australia)

9222.0 Spanish female 4-digit number station in AM at 0310. (Harwood-CA)

9270.0 Numerous MAC flights calling "Bolero Whiskey" (Zaragosa, Spain) with flight operations in USB at various times. (Battles-NH)

9270.4 VMA-RAAF Melbourne, Australia with 85/75 RTTY foxes test tape at 2323. (Waters-Australia)

9450.0 Spanish female 5-digit number station in AM at 0515 (Tuesday UTC). (HS-CA)

9993.0 Happy Day informing Fish Hawk of arrival time in USB at 0445. (Harwood-CA)

10235.0 Spanish female 5-digit number station in AM at 0207. (Fernandez-MA)

10433.0 RFFX-French Military, Paris with ARQ-E idler at 2155. (Waters-Aus)

10526.0 English female 3/2-digit number station in AM at 1542 (Thursday UTC). (HS-CA)

10527.0 9XK-Kigali, Rwanda with RTTY 170/50 sending RY DE IMI at 1739. (Waters-Australia)

10570.0 Spanish female 4-digit number station in AM at 0312 (Friday UTC). (HS-CA)

10665.0 Spanish female 4-digit number station in AM at 2216. (Fernandez-MA) Spanish female 4-digit number station in AM at 0312 (Friday UTC), 2219 (Thursday UTC), 0206 (Friday UTC). (HS-CA)

10873.0 RFVI-Le Port, Reunion Island using ARQ-E3 sending 'Controle de Voie' at 2222. (Waters-Australia)

10965.0 Unid station sending ARQ-E3 idling at 2225. (Waters-Australia)

11110.5 RFHJ-French Naval Radio Papeete, Tahiti sending ARQ-M2 idling at 1000. (Waters-Australia)

11191.0 Possible training exercise between 4FT, 4TQ, 4KR, 4KN at 0145 in USB. Mentioned that "D-23 Alligator playground switched". Also heard mentions of TAC7 and Mustache Alpha. (Jack Gray-Birmingham,AL)

11192.6 NGD-McMurdo Sound, Antarctica sending RTTY 850/75 foxes test tape at 2355. (Waters-Australia)

11214.0 Rook 77 (EC-135) working Trenton Military inbound at 1813 in USB. (Battles-NH)

11217.4 "Blue" called "Red", said antenna was pointed at Fort Ord, tried to pass message three times, in USB at 2350. (Harwood-CA)

11220.0 Same 2 units as on 11243. Heard SHOCKER HOTEL doing phone patches till 2357 when checking out for the night. Advised he was to be back on next day early. The patches referenced crane operators, Security Police, remains, cots, power and light carts, heaters, arctic sleeping bags, food. etc. Later heard requesting 6 or 8 trucks and reported that several rolls of film were enroute to McConnell AFB for processing. Later I learned that this operation was in support of a mid-air collision between 2 F-16's over Beaumont, Kansas. Newspaper reported 1 dead and 1 who ejected safety. Cellular phone reportedly didn't work due to remoteness of area, so HF was the only means of communicating from the scene. (Battles-NH)

11233.0 Rook 77 working Trenton with phone patch to Raymond 2? No idea where Raymond 2 is, in USB at 2208. (Battles-NH) *Same here Bill, I also want to know where Raymond 3 is, readers? - Larry*

11241.0 Egyptian Embassy in Washington, DC with SITOR-A traffic at 0030. (Inman-TN)

11243.0 Huron 22 working Reckless at 2157 in USB. Advised that Huron 21 flight test had problem with hydraulic system. Requested Battle Staff be notified immediately. Also Black Fly heard at 2059 advising SHOCKER HOTEL to QSY to Sierra 310. Challenges & Authentications preceded this and SHOCKER HOTEL heard checking into the net and requesting special frequency assignment. In USB, also see 11220. (Battles-NH) Lady Bird standing by for traffic in USB at 2203. (Nichols-IN)

11246.0 Snow Drop and Aircraft 053 working MacDill with a message relay for a "Ground station in the desert". (Anonymous)

11255.0 PM48 calling UQUP using 425/50 RTTY at 1213. (Waters-Australia)

11297.0 Kiev, USSR VOLMET Russian weather, followed by Rostov at 0756 then Riga, Leningrad and finally Moscow. (Fernandez-MA)

11306.0 Rockwell Flight Test with radio transmitter test in USB at 0230. (Fernandez-MA)

11318.0 Kuibyshev, USSR VOLMET aviation weather in Russian at 0748. (Fernandez-MA)

11342.0 Unid station (aircraft) advising that he will have to make a water landing in Queen Charlotte Sound. Coast Guard in Vancouver and Queen Charlotte Island were in the area. (Signal very weak and broken, it was probably working an ARINC station). (Kiely-Ireland) *Probably New York, Bill-Larry*

11631.7 RFLI-Fort de France, Martinique with ARQ-E3 'Controle de Voie' at 0936. (Waters-Australia)

12165.0 RKB78-Moscow Meteo, USSR with FAX weather charts at 0912. (Waters-Australia)

12230.0 RCU79-Novosibirsk Meteo, USSR with FAX weather charts at 0845. (Waters-Australia)

12315.0 RVW57-TASS News Agency Moscow, USSR with English RTTY 425/50 news bulletins at 0918. (Waters-Australia)

12560.0 Aero comms heard at 1513 in USB with fuel, cargo and ground information. Anybody know who this freq is used by? (Battles-NH) *Nothing on my list Bill, Image or spur maybe-Larry.*

12709.1 XFD-Salina City Radio, Mexico with CW CQ marker at 2304. (Dix-NY)

13050.0 UDK2-Murmansk Radio, USSR with 170/50 RTTY messages at 1009. (Waters-Australia)

13065.55 OW-Lagos Radio, Nigeria sending a V CW marker at 2004. (Dix-NY)

13122.55 BA44-Nicosia Radio, Cyprus in USB with marine radiotelephone traffic at 0821. (Waters-Australia)

13165.9 LPL-General Pacheco Radio, Buenos Aires, Argentina with USB marine radiotelephone traffic at 0912. (Waters-Australia)

13201.0 Linka 30 (C-130) working Thule AFB, Greenland at 2021 in USB enroute Plattsburgh. (Battles-NH)

13430.0 RRC61-TASS Moscow, USSR with German news bulletins at 0640 using RTTY 425/100. (Waters-Australia)

14362.0 'T' CW beacon every two seconds - very weak and tucked away on the low side of another signal - a rhythmic series of four or five dits then dah - sounds like "dit diddle-dit dit dit dah". (Penson-MN)

14383.5 NNN0NZK-USS Vreeland working NNN0ZTI in USB at 2130. NNN0CSE-USS Elmer Montgomery working NNN0MCL-Camp Lejuene at 2043. NNN0CVK-USS Nashville working Camp Pendleton at 2207. (Symington-OH)

14397.0 Foghorn signal heard every 40 seconds or so. Still going when I went to bed at 0440. (Penson-MN)

14458.0 Canadian Forces Amateur Radio stations, CIW2104-HMCS Provider and CIW2101-HMCS Huron working CIW216 at 2104 and 0030 respectively in USB. (Symington-OH)

14606.0 Several MAC aircraft working this frequency at 2114 including MAC MAC 3080, 20151, 531 & MAC 37. Rotating through AGA4KE at Kelly AFB, Texas. One aircraft on the ground at Hill AFB, Utah, others airborne. USAF MARS operation in USB. (Gray-AL)

14937.0 Shadow 12 (USN TACAMO aircraft) working Cape Radio with phone patch to Moody AFB CP, GA at 1549 in USB requesting to land and establishing a ground alert. (Battles-NH)

15822.0 Dept of Foreign Affairs, Rome, Italy with 5 letter cipher traffic from Esteri Roma to embassies in Gulf & Middle East using SITOR-A at 1820. (Dunnett-UK)

15966.59 VG58-Singapore Radio with CW QSX marker at 1214. (Dunnett-UK)

16685.5 LAIJ2-Norwegian ship Dyvi Baltic with SITOR-A telex message to British coast-station at 1633. (Dunnett-UK)

16835.0 CMU967-Unid Cuban station calling RMTP in CW at 1255. (Dunnett-UK)

16907.3 DHS-Ruegen Radio, Germany with CQ CW call sign marker at 1950. (Dix-NY)

16918.8 VIX6-Royal Australian Naval Radio Canberra with V CW marker at 1220. (Dunnett-UK)

17082.0 DGR28 & DGW36, Unid German stations with CW DE marker then "SFS Funkpressedienst VOM Zehnten...1700 MEZ Copyright by DPA-Deutsche Presse Agency GMBH" then datelines and press reports. Parallel to 22361.0 (Dunnett-UK) *This is a straight press agency J.M.-Larry.*

17975.0 Fever 102 (Here we go again, Bill-Larry) working Firm Pot with phone patch to SAC Command Center, Offutt AFB. Lengthy message followed requesting they initiate an immediate phone patch to "Range Man Control" at Autovon 866-7044 (Altus AFB-Larry). First time hearing Offutt come on and ID as "SAC Command Center" at 1911. (Battles-NH) *Looks like Range Man Control is the 340th Aerial Refueling Wing at Altus, Bill-Larry.*

20526.0 Unid stations with FAX weather picture at 1530. OMB 24HR PROG WPAC FAX picture. (Dunnett-UK)

20951.0 PTT Brussels, Belgium with "This is Brussels, the Belgian telegraph and telephone administration" voice marker, also in French using LSB at 1110. (Kiely-Ireland)

29790.0 Female number station, with U.S. accent, very strong signal (Sunday UTC) at 1530. (Kiely-Ireland)

The Scanning Report

Bob Kay
c/o MT, P.O. Box 98
Brasstown, NC 28902

Imagine for a moment that you're playing a high-tech game of baseball. Hurtling toward you at the speed of light, are thousands of invisible balls. In your hand, is a high-tech glove, capable of catching and identifying these balls. The object of the game is to single out and catch one specific ball.

Does it sound like a futuristic video game? It really isn't. Knowledgeable scanner buffs have been playing this game for years. The high-tech glove is something called a frequency counter. The invisible balls are frequencies. And although the game is not new to scanner buffs, very few people seem to understand how the game should be played.

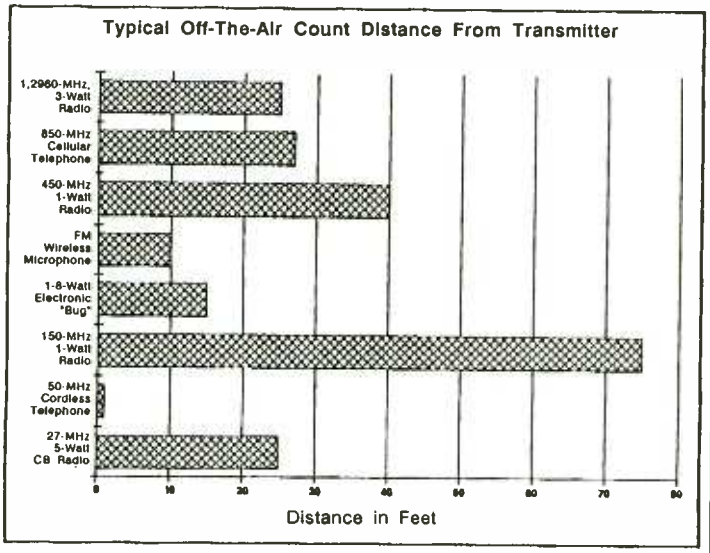
When operated properly, a frequency counter can tell you the frequency that a transmitter is operating on. Not surprisingly, such a tool is in hot demand by scanner listeners.

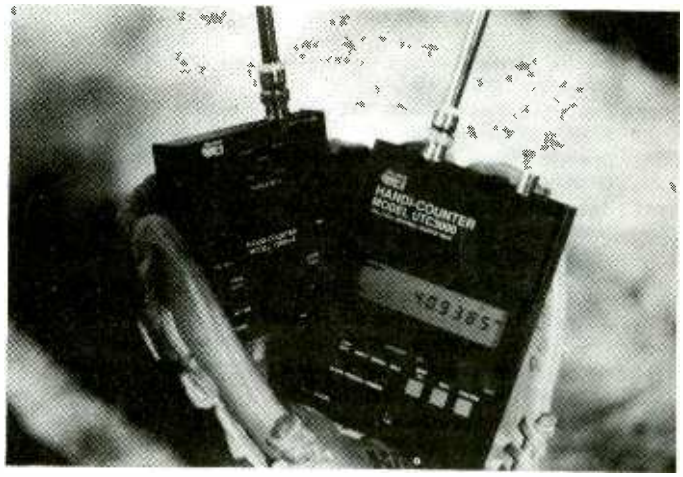
I've received numerous letters from individuals who complained that their frequency counters didn't work. In most cases, the counters were performing admirably -- it was the players who were at fault. Frequency counters are high-tech -- not magic.

A large number of scanner buffs mistakenly believe that frequency counters are capable of randomly pulling frequencies from the air. Frequency counters can, and do, catch frequencies. But no frequency counter in the world can catch frequencies from your favorite chair any more than you can play pro ball from bed.

To catch a frequency, you must get involved. In most cases, you must identify the transmitting antenna and then physically move toward it. Again, imagine that you're a baseball player. But since you can't see the ball, you'll need to move around the field. With a little luck, you'll find the best reception point, and catch the frequency. It doesn't matter if the transmitting antenna is in a fixed position or on a hand held two-way radio. To be successful, you must try to reduce the "free air" space between you and the transmitter.

Frequencies are electrical energy that travel through the air at the speed of light. When a frequency departs from the transmitting antenna it is fully charged and capable of being detected by a frequency counter. As the frequency travels away





Catching frequencies is akin to playing a high tech game of baseball.

from the transmitting antenna, it rapidly expends energy and it becomes too weak for detection. That's why it's so important to get near the transmitting antenna. As you reduce the distance between your frequency counter and the antenna, the transmitted signal (frequency), becomes stronger and easier to catch.

The exact point where the frequency becomes too weak for detection is another area that has been hotly debated. Manufacturers will usually provide a chart or graph that is similar to the one that I've included with this text. As the chart indicates, it is possible (under ideal conditions), to catch a 150 megahertz, 1 watt signal at 75 yards. But we quickly forget that the 75 yard mark represents the extreme outfield. To increase your chances of catching a frequency, remember the golden rule: "Get as near to the transmitting antenna as possible."

Another way to achieve success is to narrow your frequency catching to a specific band. Suppose that you're trying to locate a shopping mall security frequency. If the guards were using hand held radios, with small, 3 inch antennas, it would be reasonable to assume that they are operating on 800 megahertz.

To help your counter find the hidden 800 megahertz frequency, you could adjust the height of the instrument's antenna to 3 inches, or you could use an antenna that has been specifically made to receive the 800 megahertz band.

Sometimes, despite your best efforts, it may not be possible to catch a specific frequency. Frequencies can be adversely affected by electrical interference from neon lights, car ignitions, electric motors, generators and thousands of other gadgets. When a frequency is exposed to electrical interference, its physical characteristics may become altered and impossible to capture.

To reduce the effects of electrical interference, again, remember the golden rule --get as near to the antenna as possible. As you reduce the space between your frequency counter and the transmitting antenna, you also reduce the possibility of interference.

Probably the most popular frequency counter among scanner buffs is the Optoelectronics "UTC 3000." It's rugged, easy to use -- and, if you follow the tips I've just outlined, can make

your search for new frequencies one of the most rewarding parts of your hobby.

If you decide to join the fun, though, just don't forget that you'll need to take an active role in the entire process. You must identify the transmitting antenna and physically move your frequency counter to the best reception point. To be successful, it will take patience and skill. Good luck!

Treasure Hunt

You're only one month away from winning Bob Grove's popular "Scanner Beam." For our May/June Treasure Hunt, Grove Enterprises has donated not only the antenna but up to 100 feet of matching coax (with connectors!) as well.

As you all know, the Scanner Beam provides unexcelled coverage between 30 and 960 megahertz. It's also a lightweight antenna that can easily be rotated with an inexpensive TV rotor.

If you don't want to bother with installing a rotor, there's no need to worry. The Scanner Beam can be mounted in a fixed position. Although signals arriving from the sides and back will be slightly attenuated, you won't miss any of the action! Here are the clues: (All answers can be found in the February '91 issue)

1. Take a peek at the Grove product line and provide the name of the "FTR5."
2. What page contains an advertisement titled, "Bob's Bargain Bin?"
3. What organization found seven dolphins in 60 miles of driftnet?
4. It's now possible to become a Ham without taking a code test. True or False?
5. You're flying in an F-15 and approaching "Holloman AFB." What is the approach frequency?

Are you feeling lucky? If so, send in your entry today. This is the last month that you can win the Scanner Beam. Here's the address: Treasure Hunt, P.O. Box 98, Brasstown, NC 28902.

Frequency Exchange

Have you seen the television show called "The Flash?" It's about this guy who gets struck by lightning and becomes the fastest man alive. Well, hold onto your hats because we're about to "flash" across the entire country. Each time that we stop, there's no way to determine the length of our stay. We may stick around to try out 30 or 40 frequencies, or we might zip off without warning. Ready? Let's go:

Our first stop is Chicago, Illinois. If you have a listing of frequencies for this area, Sherman Larsen, would like to exchange frequencies with you. Sherman is a scanner buff, and if you write to the Frequency Exchange, P.O. Box 98, Brasstown, NC 280902, I'll see to it that you and Sherman get together.

Southwestern Michigan is up next. Here are the frequencies for Kalamazoo: (The contributor wishes to remain anonymous)

155.685	Police
155.190	Police
155.865	Police
154.980	Public Works
155.775	Building Inspectors

Welcome to Phoenix, Arizona. (Hey, I told you to hang onto your hat!) This list was sent in by Raymond Conroy.

414.550	FBI Bank Robberies
415.050	Postal Inspectors

Say so-long to Phoenix; we just entered Milwaukee, Wisconsin. Here are the frequencies for the Milwaukee Post Office in West St. Paul: 407.175, 408.025, 409.275, 410.325, and 411.625. There's no time to send a post card to your friends. We must depart for....

....Wichita, Kansas. Bob Yuna lives near Wichita, and here are a few of his favorite frequencies:

138.075	McConnell AFB OSI
138.175	"
148.075	Commanders Net
153.1700	Security for "LEARJET"
154.725	Wichita Detectives
163.5125	McConnell AFB Security
173.5850	McConnell Crash Trucks
413.4500	Crew Alerting--SAC

Need a few moments to catch your breath? No problem .... there, you should be rested, and ready to visit Houston, Texas. David P. Hanus was in Baytown, Texas, and he found the following frequencies to be active at the National Hot Rod Association:

461.825	NHRA Safety
463.3375	Nashville Network-Diamond P Sports
464.500	NHRA primary pit control

In case you're wondering, we just entered the city limits of Los Angeles, California. If you're not too tired from running, check out the following:

453.200	San Diego Wild Animal Park
453.325	San Diego Convention Center

453.950	Anaheim Convention Center
460.550	Los Angeles Convention Center

Since we're already in California, let's dash over to Sunnyvale. Ken Bellum lives nearby, and he sent in the following:

450.187	KNTV Channel 11
450.287	KGO Channel 7
450.312	KICU Channel 36
450.337	KTVU Channel 2
450.412	KRON Channel 4

Ready for a well deserved rest? Would you like to sit back, and take a leisurely look at Bob Yuna's complete listing for Wichita, Kansas? If so, I'll send you over 240 frequencies for an SASE. That's right, the list is free, but your request must be postmarked before July 1, 1991. Requests made after that date should include $1.00 dollar for copying and handling fees.

Taking the Test

Here are a few names of those individuals who passed the Novice and or Specialist Exams with two wrong or less:

Victor Balough	Samuel McConnell Jr.
David Beach	David Page
Stewart Cooke Jr.	Gregory Reid
Richard Gaskill	Paul Stachowiak
Marc Luther	

Are you interested in putting your skills to the test? Here's how to apply: There are three skill levels, (1) Novice, (2) Specialist and (3) Scanning Communications Expert. Each skill level has a separate, 30 question test. The cost of each test is $10.00 dollars. But, you're not required to take all three tests. You can skip the Novice and Specialist Exams and take the Expert Exam. However, your total cost to become a SCE will always be $30.00 dollars. Does it sound confusing? It really isn't.

Basically, the choice is yours. You can pay $30.00 dollars in one lump sum and take the Expert Exam or you can pay $10.00 dollars each time that you upgrade to the next level. If you choose to take all three tests, you'll get three separate certificates. If you skip a test level, that's one less certificate that you'll have to hang on the wall.

I suggest that you take all three tests, one at a time. Each test will help to build your confidence, and you will become familiar with the types of questions that are being asked. To put your skills to the test, send a check or money order to, "Scanning Test," P.O. Box 695, Honeybrook, PA 19344.

Computer Corner

Thanks for responding with your comments and ideas. I'm currently looking at several software programs that were sent in by readers and manufacturers. I've also received several disks that contain frequencies for various areas throughout the nation.

Are you using a computer to store your frequencies? If so, why not share your program and or frequencies in the "Computer Corner." Simply place your 5-1/4" or 3-1/2" disk in a mailer and send it to the "Computer Corner", P.O. Box 173, Prospect Park, PA 19076.

In the meantime, I'll be searching through the mail, and looking for software programs and frequency disks that I can share with everyone.

Good-bye Harrisburg

Do you live in Harrisburg, Pennsylvania? If so, you probably know that the Harrisburg police operate on the following frequencies: 460.275, 460.300, and 460.325.

You probably don't know that the Harrisburg police will soon be equipped with a new communications system that is called "Computer Aided Dispatch" (CAD). The new CAD system uses computers technology to send encoded messages between police cars and the dispatcher. The sad news is that the new CAD system cannot be monitored on a scanner radio.

Cellular Phone Fraud

Drug dealers have been using a "black market" computer chip that allows them to make telephone calls that cannot be verified for billing. The computer chip provided traffickers with a certain degree of anonymity. They could make calls without worrying about producing a traceable record.

As the computer chip became popular, the Secret Service stepped in and developed a special code that would render the chip useless. The first day the code was used at "PacTel Cellular" in Los Angeles, about 5,000 illegal phone calls were blocked. (News clipping from Mark Cobbledick, Fort Payne, Alabama.)

Monitoring the Music

Doug Candler recently took his Pro 2004 to a theater in Atlanta, Georgia. From the parking lot, Doug monitored the orchestra, and the individual singers that were performing on stage. How? He simply monitored the following cordless microphone frequencies: 171.600, 190.525, 204.13, 205.805, and 206.155.

Scanning at Home

Are you scanning your neighborhood? If so, why not share your adventures with other readers of *MT*. Send your comments, suggestions and frequency lists to the Scanning Report, P.O. Box 98, Brasstown, NC 28902. See you next month.

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Regency R3020	96.99	(7.00)
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SHORT WAVE RECEIVER

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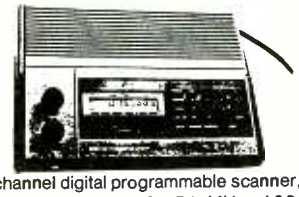

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Same features as BC–600XLT but also receives 800-954 MHz. *(Excludes cellular)*

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what's new?

Larry Miller

Military Radio Systems:

California (First Edition)

When people speak of Bob Kelty's California *Military Radio Systems* book, they usually use three words, all spoken in hushed, reverential tones: "excellent" and "long-awaited."

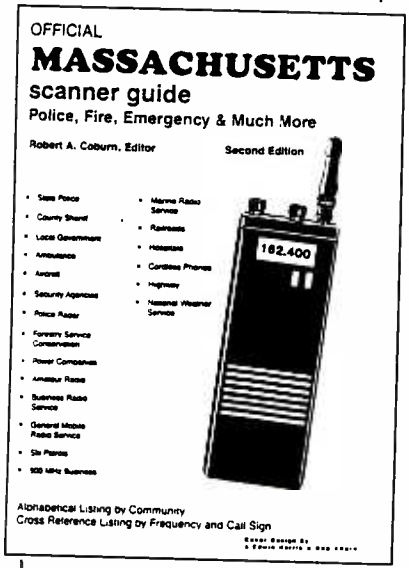
Says Kelty, "It's finally a reality after eight years of work bringing all the information together." He's ebullient and well he should be. The book is a masterful work, notable for both its coverage of Army, Air Force, Navy and Marine communications and its accuracy.

Says Herman Frisch of the California-based Bay Area Scanner Enthusiasts Club, "The 216 page directory appears to be very accurate, very up-to-date, very precise, very well organized and very, very expensive at $37.50 a copy."

Kelty says that he got his data from "unclassified listings purchased from the United States National Telecommunications and Information Administration" but that the material was "carefully edited to meet the terms of Executive Order 12356 April 2 1982 to not provide information leading to the disclosure of military, scientific, technological, or national security related matters or operations."

Military Radio Systems: California (First Edition) is primarily a UHF (225-400 MHz) book and is designed for west coast listeners but has a good deal of information that other hard-core military monitors would certainly find both interesting and helpful.

You can get a postpaid copy of the book by sending $40.00 to Mobile Radio Resources, 1224 Madrona Ave, San Jose, California 95125-3547. ASCII 5-1/4" disk or 3-1/2 inch microfloppy versions are available for $50.00 from the same address.



Massachusetts Scanner Frequencies

Equally is Bob Coburn's *Official Massachusetts Scanner Guide.* Now in its fourth edition, the book contains frequencies for police, fire, emergency and, according to the cover, "much more."

That's no idle boast. Along with the "big three" is the latest information on where to tune to hear local government, aircraft, security agencies, forestry service, power companies, business radio, ski patrols, marine radio, railroads, hospitals, and, well, you get the idea.

Data is arranged by community and by frequency for easy identification.

This latest edition of *Official Massachusetts Scanner Guide* takes 496 pages to accomplish this Herculean task and boasts 19,249 licenses, an increase of over 5,521 listings over the third edition.

Of note are the most recent 800 MHz regional listings, cellular phone site licenses, broadcast auxiliary and maritime coast, including high frequency coast stations.

Whether beginner or seasoned pro, *The Official Massachusetts Scanner Guide* belongs next to any MA resident's radio.

The book is available from the publisher for $24.95 plus $3.05 shipping. The address is P.O. Box 712, Londonderry, New Hampshire 03053.

Toronto: Scanning is Alive

Less imposing than most scanner directories is Phillip Boucher's *Toronto Scanner Directory 1991.* A no-frills 40 page, 5-1/2 x 8-1/2 inch handbook, *TSD* offers 8 pages of public service frequencies for the Toronto, York, and Durham, areas, arranged by location. An additional eight pages is cross-referenced by frequency.

Perhaps what makes this little book unique is its lack of pretense and its willingness to take the time and space (a good portion of the book) to *explain* things to the listener. As a result, new monitors will find the book quite helpful; other, more experienced listeners will enjoy some of the tasty little tid-bits of background info.

To get your copy of the *Toronto Scanner Directory 1991,* send $10.00 plus $2.00 postage (Ontario residents add .80 PST) and send it to Joe Skyfoot Word and Music Creations, 245 Lakeshore Drive, Suite 303, Etobicoke, Ontario M8V 2A8.

Cloak and Dagger

Glenn Roberts has published a 15 page listing of "companies that supply equipment, and services related to the field of electronic surveillance." Some 112 companies are listed, each with name, address, and phone number followed by a brief description of the equipment or service they provide.

The publisher calls the list (the pages come paper-clipped together) "A must for anyone in the law enforcement or security field." We call it, well, kind of sparse.

The Spring 1991 edition the *Directory of Electronic Surveillance Equipment Suppliers* costs $6.00 postpaid from Glen L. Roberts, Box 903, Libertyville, Illinois 60048.

More Cloak and Dagger

Back when the United States entered World War II, President Roosevelt realized the need his country had for an intelligence service. He turned to an old friend from New York, William J. Donovan, to create this organization. The result was the Office of Strategic Services (OSS).

The OSS was an exercise in improvisation, specializing in highly unorthodox warfare. Incredibly, Donovan's OSS, in

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P.O. Box 98, 140 Dog Branch Road
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1944, published a "Sears and Roebuck" style catalogue of weaponry available to agents for use in carrying out their clandestine assignments.

At first glance, some of the devices seem comical, reminiscent of the old "Get Smart" TV show of the 1960s. There is a .22 calibre cigarette, explosive coal ("looks like an ordinary, large piece of coal...that can be packed with explosives. Explosive charge must be ordered separately.") and a small tube filled with "a liquid chemical of violent, repulsive, and lasting odor...of accidental feces" amusingly called, "Who, Me?" An OSS agent could even order a one man submarine called the "Sleeping Beauty."

Of particular interest is a section on spy radios, cipher machines and one-time pads that once again show the actual purpose of the accurately labeled "spy numbers" broadcasts.

As the books' liner notes say, despite the sometimes far-fetched and sometimes even humorous nature of some of the devices, "these weapons really existed [and were] some of the most innovative and deadly devices ever created."

OSS Special Weapons & Equipment is an authentic reproduction of one of only three copies of Donovan's book known to be in existence today.

An attractive hardcover, the book is $14.95 and can be purchased at your local bookstore. (ISBN: 0-8069-8238-1).

Amateur Information

The book is called the "Amateur Hambook" and with that tongue-in-cheek title, ARTSCI, Inc. has launched the first edition of what should become a valuable reference book in the ham community, especially with the new wave of code-free licensees.

ARTSCI defines the book as "a book containing graphs, tables and drawings of materials of specific interest to all amateur radio operators" and that it is. Included among the 130+ page book is the U.S. Amateur Bands/License Allocation chart, the international Morse code table, Q signals, HF SWR graphs and antenna tuner tables, international call signs, latitude and longitude guide, a shortwave listening frequency guide, RTTY listings -- just about everything you'd need to know -- even instruction on preparing for disaster.

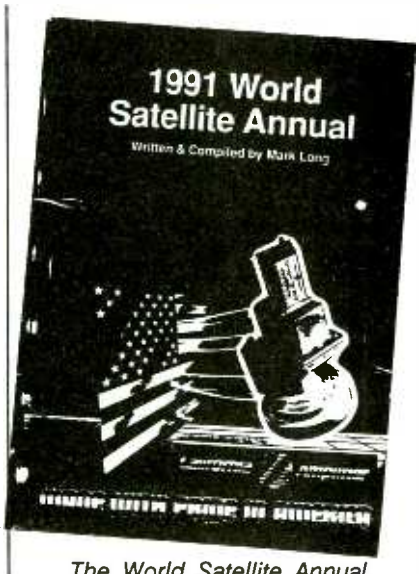
The Amateur Hambook is available for $14.95 plus $2.00 shipping from P.O. Box 1848, Burbank, California 91507. For more information, call 818-843-4080.

1991 World Satellite Annual

"The Next Generation of World Satellites Explained..."

"An Up-to-Date, Comprehensive Global Satellite Transponder Loading Report"

These are two of the features of Mark Long's 1991 *World Satellite Annual*. If they look attractive to you, then you may want to pick up a copy of what the publisher calls "The Official Supplement of the *World Satellite Almanac*."



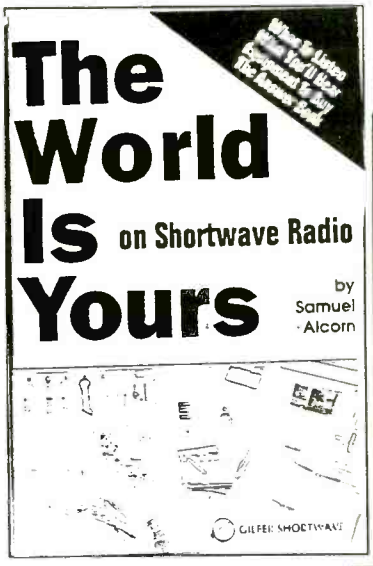
The World Satellite Annual is, in fact, a working tool for thousands of satellite professionals -- key corporate decision makers and engineers who already own the first or second edition of the *World Satellite Almanac*. It is not something that the average "Joe" is going to settle in with on the beach.

There are chapters on the status of DBS in America, satellite launch vehicles, the satellite news gathering revolution, C-band antennas in a 2 degree spacing environment, and the European scrambling system.

Also included are detailed descriptions of next-generation satellite systems like Eutelsat II, Intelsat VI and Telecom II.

There is also a comprehensive Global Satellite Transponder Loading Report and more than 100 new charts, graphs and previously unavailable satellite footprints.

The World Satellite Annual is available from MLE, Inc., P.O. Box 159, Winter Beach, Florida 32971. The price is $49.95 plus $7.00 shipping and handling.



An HF Book You Can Live With

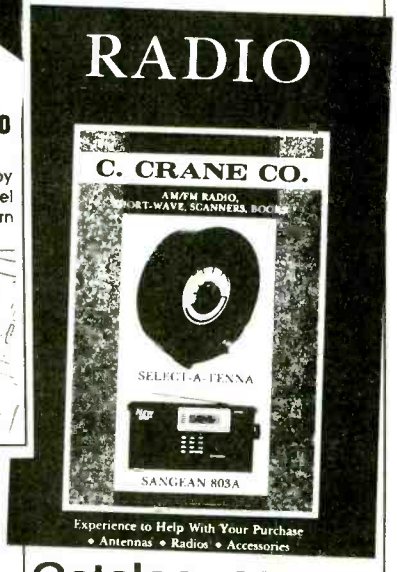
June has not been a good month for shortwave publications, scanner frequency directories and satellite manuals having dominated the early summer scene. The month is not, however, without its gem, a small beginner's book called "The World is Yours."

Actually, *The World is Yours* is not new. It is, however, a new edition, and the publisher says that "every chapter has been revised and updated."

The book is 80 pages, quite nice, with an index, glossary and bibliography. But perhaps the best part of the book is its avoidance of jargon and pleasant, easy tone -- unlike similar books which seek to impress you with the amount of technical jargon the author knows.

As a result, *The World is Yours* should find its mark among people who simply want to listen -- and who don't want or need to know how to disassemble their $39.00 DAK portable's IF frequency demodulator.

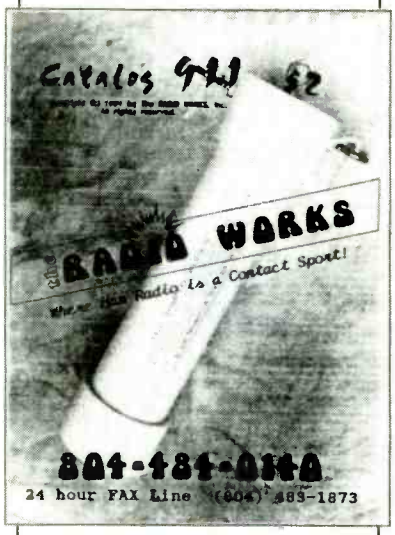
You can get your copy from your favorite bookseller or direct from the publisher, Gilfer Associates, Inc., for $9.95 plus 3.00 UPS. The address is P.O. Box 239, Park Ridge, New Jersey 07656.



Catalogues

There are two new catalogues of note. The first is a small but attractive publication from the C. Crane Co. entitled "Communication Excitement." Crane offers "experience to help with your purchase" and puts its limited but carefully chosen selection of radios and accessories into one of two categories -- "best made" or "best for the money."

A copy of the C. Crane Co. catalogue will cost you $1.00 and can be purchased from the firm at 147 Watson Lane, Fortuna, California 95540. Their phone number is (orders only) 1-800-522-TUNE or (other inquiries) 707-725-5940.



This month's second catalogue is produced by a firm called "Radio Works." Radio Works is a ham radio-oriented firm (its slogan is "where ham radio is a contact sport,"), specializing in baluns, to which it devotes 20 pages, including the front cover.

The remainder of the 80 page magazine-sized document offers a seemingly endless variety of antennas, coax and connectors, much of which would be of interest to both shortwave and scanner listeners.

"The cover price of the Radio Works' catalogue '991' catalogue is $2.00," says owner Jim Thompson, "but to *Monitoring Times* readers, it's free." You can contact Radio Works by mail at P. O. Box 6159 Portsmouth, Virginia 23703, by phone, 804-484-0140 or by FAX at 804-483-1873.

Treasure Hunters Guide

"I've always been fascinated by treasure hunting," says publisher Bob Grove. His years in Florida were often spent on the beaches "coin shooting" with metal detectors of all varieties, including some designs of his own.

"Still, each year when my copy of the *Treasure Hunters Buyer's Guide* arrives," confesses Bob, "I eagerly pore over its pages to see what miraculous new developments will invite me to discover untold riches buried only inches below the surface of the ground in some forgotten ghost town."

This new 1991 edition is loaded with fascinating reading and hundreds of photos, a glossary of terms associated with metal detectors, quick look-up charts comparing metal detectors from different manufacturers, special features on choosing the best metal detector for your needs, and lists of accessories to make detecting even easier.

The annual treasure locators section is just as fascinating because of its wealth of misinformation. Here, in one concise collection, is a catalog of quack machines for the gullible. Imagine being able to detect a single coin hundreds of feet away, buried several feet in the ground!

Want to buy an air-to-ground surveillance system utilizing a directional frequency phaser with a kinetic magnum shield? Want to buy a bridge? Dowsing rods, pendulums -- they're here too.

The publisher wisely makes no claim regarding the validity of the manufacturer-supplied descriptions and fanciful specifications. The wary buyer must distinguish the hocum from the science. Fortunately, the publisher has already segregated the sections and they're fun to read.

The Treasure Hunters Buyer's Guide by Rosemary Anderson is $12.95 plus $2 shipping from People's Publishing Company, PO Box 1095, Arcata, CA 95521.

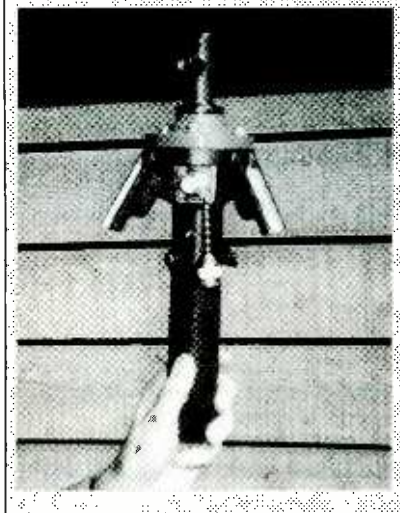
Review

SURPLUS STUFF

A fascinating collection of surplus items may be found at Air Navigation Industries (39A Phoenix St., Canandaigua, NY 14424-0191; ph. 716-394-9099/8329). Norm Lietsche, the owner, occasionally sends us a sample for review. Two came in recently.

Ground Plane Antenna Base

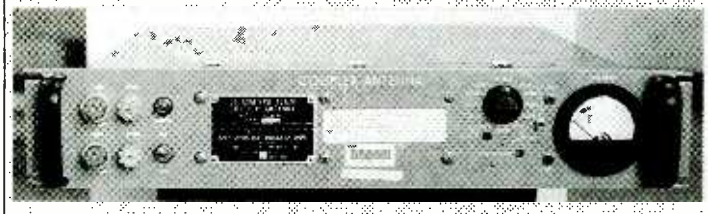
For antenna experimenters who like to "roll their own", or even VHF/UHF monitors (or CBers) who would like to build a ground plane antenna that would take a tornado to knock down, this military AB-381/U ground plane base is an excellent start, and at $10 the price is right!



Constructed of 1/8 inch aluminum with a molded insulator, standard 1/4 inch, 20 TPI bolts may be used to secure the four elements in place; the holes are all tapped with steel inserts.

To determine the number of feet each element should be when you go to the hardware to buy your 1/2" galvanized, copper or aluminum tubing, simply divide 234 by the frequency in megahertz.

The only drawback is the non-standard (to the hobby market) C connector; it may be adapted to a more conventional UHF or BNC or, better yet, replaced by a flange-mount SO-239 (UHF).



Shortwave Receiver Multicoupler

If there's one thing that can't be found on the consumer radio market, it's a no-loss device for connecting more than one shortwave receiver to one common antenna. Norm has a solution for that problem as well.

Up to 32 general coverage receivers (100 kHz-30 MHz) may be used simultaneously when connected to the CU1280/FRD-10A(V) antenna coupler manufactured by Sylvania for the U.S. Navy.

The 19" rack-mount unit is only 3-1/2" high and utilizes all BNC connectors. It is powered from conventional 120 VAC/60 Hz. The unit appears passive to signals; 0 dB gain from all ports is distributed by wide-dynamic-range RF power transistors.

A front panel meter monitors levels and adjustments are accessible if alignment is ever necessary. The antenna coupler is priced at $125.

Spin the Dial for Summer Fun

June is busting out all over. In addition to being the punch line to several very poor jokes, June is busting out with things that tend to modify or even block our ability to enjoy the radio monitoring hobby.

I am not simply talking about long overdue chores like painting the house or taking the kids to the zoo. The very atmosphere around us conspires with static crashes and extended daylight to block many listening activities common to winter.

Does this mean we have to let our hobby gather dust until the wind turns cold again? No way, Jose. The coming of summer just means we have to try some other aspects of the radio hobby beyond simple shortwave listening and scanning.

Since summer gets most of us up from the basement and out into the real world, let's take a look at some radio fun we can have that won't get in the way of all that other summer work and play.

With that, I give you . . .

UNCLE SKIP'S GUIDE TO SUMMER DIAL SPINNING

I am going to make the relatively safe assumption that most folks will be spending some portion of their summertime traveling, or at least out of doors. These travels can lead even the most dedicated DXer into new pastures.

Summer AM and FM Broadcast Listening

If you have been following Karl Zuk's "American Bandscan" column for any length of time, you have probably noticed that a lot of exciting things have been going on around the country on the good old-fashioned standard AM and FM radio frequencies.

Since you may be likely to find yourself exploring some of this great country while traveling in your car, why not take advantage of that radio stuck in the dashboard to check out something other than the latest New Kids On the Block song or the local Larry King outlet? Spin the dial and see what else is out there in radioland.

AM Broadcast, the Traveler's Companion

In AM land, you can augment your travel and even get information prior to heading out for a particular part of the country by giving a listen to the "clear channel" stations. These are stations throughout the country that are authorized to use 50 kilowatts of power into an omnidirectional antenna 24 hours a day, seven days a week.

Even the poor conditions of summer do not stand in the way of most of these powerhouses. Any of the more comprehensive radio frequency guides such as *The World Radio TV Handbook* or the *National Radio Club AM Radio Logbook*, both available through DX Radio Supply, have extensive mediumwave guides that will point you in the direction of the stations you might be seeking. Armed with a good frequency list, you can "listen ahead" to the part of the country you are going to almost any evening.

However, once you actually get there, you will get a better notion of the local environment by giving a listen to the "graveyard frequencies." These are low power, usually one kilowatt or so, stations found on 1230, 1240, 1340, 1400, 1450, and 1490 kHz. These stations are super sources of local news, weather and traffic as well as local advertising. If you want to get the full flavor of that vacation spot, you have to check out the local stations.

Okay, so you are in Vacationland and you are feeling a little homesick. What do you do? Hit that 50 kilowatt list again and find the "clear channel" station nearest your home port. On most evenings, provided the immediate area weather is not too foreboding, you will probably be able to hear what you are looking for.

Summertime means more to the DXer than simply painting the house.

While you are trying to hear back home, you might want to log a few stations you have never heard before. Many AM stations will even QSL if you send a complete report and return postage. Give it a try. You might just discover that AM broadcast listening is as much fun as SW.

I Love FM in the Summer

In most places around the good old US of A, early summer is signaled by cool nights and warm days coupled with the occasional violent weather pattern. All these factors figure in making FM DXing a great summer sport.

Normally, FM signals are limited to line-of-sight broadcasting and for this reason they are considered ideal for local broadcasting of very high quality signals free of most atmospheric interference. In the summer, however, neat things happen to the standard FM band.

Early in the morning, as the cool night air is warmed by the summer sun, you are likely to encounter a condition known as tropospheric ducting. This is when layers of cool air become trapped between layers of warm air. This atmospheric anomaly allows some FM signals to travel for extreme distances. The duct of cool air carries the signal well beyond the normal line-of-sight barrier.

So while you are wolfing down your cornflakes in the morning, you might want to spin the dial on Mom's kitchen radio and see what neat things are out there. Drastic changes in air temperature brought about by a summer storm can also create this effect. Take care when toying with radios during summer thunderstorms. Lightning can kill.

Throughout the radio day and into the early evening you will also encounter something known as Sporadic E Layer Skip -- no relation to Uncle Skip. Don't worry about the complexities of propagation at this stage of your radio experience. Accept "E Skip" as a simple gift of summer that allows FM radio signals to occasionally bounce off the atmosphere, not unlike shortwave signals.

Multiple hops can bring a distant signal to your receiver. This effect tends to peak in late June so now is the time to get cracking on logging

all of those neat FM outlets throughout the country.

If you peruse the catalogs produced by the advertisers here in *MT*, you will find several sources of FM frequency information. A book like Bruce Elving's *FM Atlas* is literally a map for such stations; the "by frequency" and "by call letter" listings and map section can be invaluable since stations today rely more on slogans than call letters -- "Star 104.5," "Kiss 100" and so forth.

Vacationers can listen around to local outlets just like the AM crowd to get a notion of the neighborhood. You should find local listings in an area newspaper. Failing that, the map section in *FM Atlas* will help you find stations to hear as you pass through different locales.

However, you can't really depend on FM to get you back home because the long distance stuff is a little less dependable. But since this is a summer activity, why not just relax and enjoy what comes out of the speaker?

Again, FM stations will usually QSL a good report.

Summer Scanner Stuff

If you are a scanner listener, and you skipped over the section on FM signals, you may want to give it a good read. Many of those crazy summer atmospheric antics that make FM broadcast listening so exciting will also apply to the VHF signals trapped by your scanner.

Suppose you are scanning your local police or fire frequencies and you notice that one or more of the signals which normally come in crystal clear seem to be experiencing some interference. This is your call to action.

Disengage from the local stuff and start hunting around the same band on frequencies that are not in local use. You might just discover distant stations booming in. There is a well-worn scanner story about a guy who heard a fire call late one evening, giving his home address. Rising to the call he forced his family out of their slumber and into the street.

When no fire trucks pulled up to his house this concerned citizen woke up a neighbor and called the fire department to find out what was keeping them. The fire folks had no knowledge of a call to his address. About this time he took a few moments to notice he did not, in fact, smell any smoke or see any flames.

He was the victim of a "skipped" signal from some distance away which coincidentally was made in response to a fire at a similar address in another town. I'll bet the guy is still trying to make it up to his wife.

Summer SWLing

I haven't forgotten you diehard DXers. You can, in fact, enjoy a great deal of exciting summer listening on the shortwave bands.

While you will be competing with a great deal of atmospheric noise, you will still find plenty of signals on the 31 (9500-9775 kHz), 25 (11650-12050 kHz) and 19 (15100-15600 kHz) meter bands.

You can also give a try at utility listening. Keep an eye on Larry Van Horn's "Utility World" column for the neat signals you can hear even through the summer static.

As the summer progresses, you will start to hear about tropical storms and hurricanes on the weather reports. When a major tropical storm is in the news, tune to 3407, 5562, 6673, 8876, 10015, 11898, 13267 or 21937 kHz, all upper sideband, and give a listen to the National Weather Service Hurricane Hunters. These are WP-3 Orion aircraft that fly right into the storm to gather data. If that doesn't excite you, you might want to check your pulse.

Summer Fun Across All the Bands

Remembering that summer is a time for relaxation, your listening habits can take a bit of a vacation too. You don't have to go digging for DX under all that atmospheric noise. Why not just listen to and log the easy stuff?

Think for a minute. Have you ever really logged and QSLed the really common stuff you sometimes hear? Old Uncle Skip's advice is to grab it now because it can go away at any time. Use the summer to back up and verify your local stations as well as the really common SW outlets. In a changing world you may discover it is a good investment of some light summer listening time.

As a teenager, I listened to WIBG 990 kHz, Philadelphia, Pennsylvania, everyday. It was sold and the call was changed. I would give anything to have that QSL in my collection as a fond memory of my misspent youth. Don't make the same mistake. Summer time is local logging time.

Don't forget that this is supposed to be a fun hobby, folks. It is no sin to just sit back and listen to the programming for its content and not merely as a vehicle for acquiring a verification card. Enjoy the music, digest the news broadcasts, let the discussion programs sink into your gray matter.

Many beginners get so busy chasing stations in order to get their totals up that they forget the simple pleasure of listening to the programming. Taking the time to listen will actually help you in the long run because program knowledge will give you the depth necessary to became a really excellent DXer down the road. Besides, what summer would be complete without falling asleep on a lawn chair with a baseball game playing in the background?

Relax and enjoy the summer, folks. Don't forget that this is a good time to start making plans for the *Monitoring Times* Convention in October. We are planning an expanded Beginner's Seminar scheduled just for you. Come on down!

Rod Pearson

Secret City

A secret city exists in Maryland. The city has a permanent population of about 4,000. Another 50,000 commuters from nearby Washington D.C. invade the city every working day. The city has what you would find in most communities, a police force, fire department, hospital, bank, travel agency, a library, barber shop, university (with 20,000 students), television station, and a post office.

But it is not a typical town. The whole area is encircled by two 10-foot fences topped with skin-ripping razor wire. Between these two fences is a high voltage electric fence that promises to fry anyone stupid enough to touch it. Guards, armed to the teeth, and snarling attack dogs keep unwanted visitors away. They are backed up by sensitive motion detectors and infrared night vision cameras surveying the scene night and day.

Other signs betray the fact that this isn't a typical small town. Blank looking buildings with mirrored windows have sprouting from their roofs huge antenna arrays, satellite dishes, long wire antennas, and gleeming white radomes. The contents of the buildings would make any radio buff's head spin with delight.

It's a utility monitor's heaven, for the building is packed with latest state of the art communications interception equipment, and computerized cryptographic gear, all scanning, recording, decoding and analyzing the communications emanating from the world's political powers.

What is the name of this city, and when can you move there, you ask? This super secret eavesdropping town is none other than the National Security Agency. Located in the middle of Ft. Meade, Maryland, the NSA is the top of the pyramid when it comes to communications interceptions. Still interested in moving there? The NSA is always looking for new personnel to join its ranks of cryptographers, monitors, electronic experts and spies.

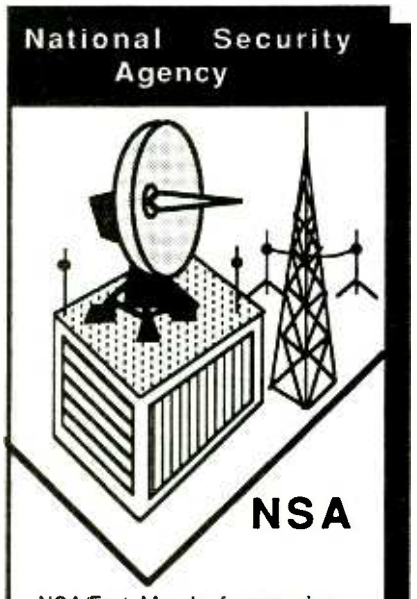
If you love monitoring, are fluent in certain languages (such as Arabic or Russian) or have an electronics background, the NSA may have a job for you. If you qualify and can pass the intense background security checks, you could be accepted to work in monitor heaven. Imagine having at your fingertips access to the most sophisticated receiving and decoding equipment in the world.

The only drawbacks are that you can't reveal what you intercept to anyone except the intelligence community:

The super secret intercept society of the NSA draws into its electronic vacuum all the top secret radio communications emanating from the world's political, economic and military machines. Not much escapes the ears of the NSA.

In contrast to the mountainous volume of intercepted communications gathered by the agency, not much information gets out about the top secret world behind the NSA gates. It's a one-way street. Information vital to national security is collected here but any information about the inner workings of the NSA is almost impossible to come by.

What is known has been pieced together from intentional and unintentional leaks, ex-employee tattlings and the investigative press. The little that does get out hints at a truly mammoth communications interception system.



NSA/Fort Meade frequencies
Airfield opertations:
App/Dep: 119.700, 231.600
Tower: 127.000, 248.200
Ground control: 121.750, 227.100
Fire dept: 407.325
Military Police: 163.475, 163.5625, 165.5625, 163.575
Others reported:
139.250, 140.000, 141.025, 141.325, 142.350, 150.425, 150.450, 150.525, 150.575 167.825,173.4625, 407.475, 407.575,412.975, 413.525

The NSA is the major intelligence gathering agency in the world. The whole radio spectrum is the hunting ground for the radio interceptors at the NSA. From the ultra low frequencies to the upper reaches of the microwave bands, everything is covered. All communications intercepted are taped and then processed through super intelligent computers like the Cray 1.

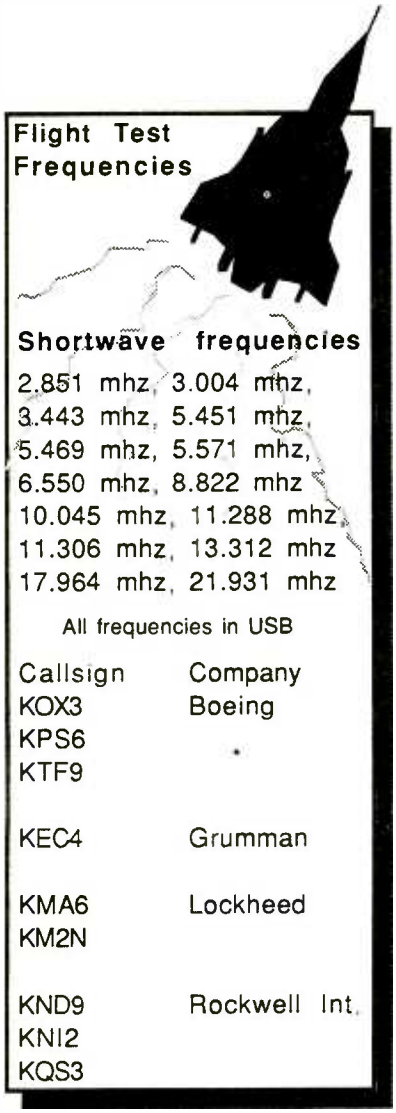
The Cray is capable of dissecting and analyzing any signal and is used for busting the so-called unbreakable codes used by other nations. The Cray (code name Loadstone) is capable of dissecting over 200 million operations a second (100 times faster than the fastest IBM computer).

Information is fed to the Cray from secret NSA listening posts based in this country and around the world. Major listening posts are based in Japan, Turkey and Germany and in other friendly nations that are in radio earshot of a targeted country. There are also domestic listening posts with quaint names like Vint Hill Farms, Virginia and Two Rock Ranch, California (just north of San Francisco). Other minor listening posts exists in Florida, Alaska and Puerto Rico.

There are also various ELINT (Electronic Intelligence) gathering platforms such as the Cobra Ball RC-135 aircraft used to monitor Soviet communications, ELINT spy ships (such as the ill-fated U.S.S. Pueblo) and orbiting super-spy satellites of the Key Hole series. We will take a closer look at these ELINT platforms in the next Federal File. We will also look at some of the unique ways the NSA gathers its information from around the world. In the meantime we will just have to settle on eavesdropping on the master eavesdroppers, using the list of reported frequencies used at the NSA headquarters in Maryland.

HYPERSONIC RADIO

The race is on. Aerospace corporations from around the world are in a race to create the world's fastest airliner. The goal is to design and build an aircraft capable of flying from Los Angeles, California to Sydney, Australia in five hours. Some say such an aircraft already exists. Rumors persist that the Aurora, a hypersonic spy plane replacement for the SR-71 Blackbird is operational and capable of Mach 6 speeds. Others say a true hypersonic aircraft is still on the drawing boards.



Imagine it. Flying from New York to Los Angeles in minutes instead of hours! The challenge is to design an aircraft frame, new composite materials capable of withstanding the high heat generated at Mach 6 or better, and an avionics package to control it all. There are even studies for super hypersonic aircraft that will fly at Mach 14. That's over 10,000 miles an hour. Coast to Coast in 25 minutes.

Not only are there monumental problems in designing, building and testing such an aircraft but reliable communications systems are required as well. Several communications companies are addressing that problem now, such as Collins, Motorola and General Electric. To communicate and pass data on to an aircraft +travelling at such high speed will probably involve multi channel, secure satellite communications. Many special problems can occur during Mach 6 travel.

For example: If a hypersonic aircraft is placed in a holding pattern around Los Angeles International Airport, the pattern would take it over Arizona, New Mexico, Texas, Colorado and Nevada. Normal VHF aircraft line of sight communications will not do. That is just one of the problems associated with communicating with the hypersonic aircraft. But until the system is developed we monitors will have to settle on monitoring the facilities charged with the design and manufacture of the HSCT.

MAILBAG

I got an interesting letter from a sailor and Federal File reader who prefers to remain anonymous. He was writing from the U.S.S. Nassau, somewhere in the Persian Gulf. According to our anonymous friend, the Nassau was used during a mission to the Caribbean for support during a presidential visit by George Bush in February. Listed below are a few of the notes taken by our anonymous writer during the mission. The agencies involved are the White House Communications Agency (WHCA), Justice Department, Central Intelligence Agency and the Secret Service.

Monday, 5 Feb 3
- •USA helos from Quantico MCAS arrive
- •Guarded 24 hours a day by marines with walkie talkies freqs: 163.259, 163.261, 163.263
- •WHCA officers bring gear on board-talking with HT's 166.700 MHz Setting up antennas on Level 08

Tuesday, 6 Feb
- •WHCA still setting up antennas
- •Early a.m. radio checks on 166.5125 and again about 11:00 a.m.
- •Overheard "Which antenna?" Answer "MSAT."
- •Constant radio checks on 166.700 MHz
- •Real powerful, possibly base station
- •At 13:10 164.8875 very active with radio checks. DVP scrambling used.
- •Made trip to Level 08. Located two low-gain domes separated by 3 three feet. Also found small umbrella type dish with fan looking feedhorn.
- •165.375 MHz and 164.400 MHz active at 17:10.
- •More DVP.

Wednesday, 7 Feb
- •Base now referred to as "Nassau Base."
- •Scrambled comms on 162.6875 MHz and 415.975 MHz
- •Radio check on 171.2875 MHz
- •Overheard: "How's it going up there with that Y Z?
- •Y=Yankee, phonepatch satellite uplink channel,162.6875MHz
- •Z=Zulu, phone patch satellite downlink channel, 171.2875 MHz165.7875 MHz
- •talk in the clear 164.650 MHz
- •radio check (real short) Sierra (Nassau base) on166.5125 MHz in clear
- •Lots more radio checks in clear and secure. (seems like they are in a hurry)
- •Overheard radio telephone check and international phone call on 164.975. 162.375 MHz and 163.150 MHz
- •Phone calls in FM SSB (Satcom?)

Jean Baker, KIN9DD

HF Terminology

More Computer Games

By now, all of you who've ordered the computer shareware we offered in a previous column should have received your disks. We've heard from quite a few readers who are very pleased with the programs, so we may consider doing this again when I find new shareware.

Other aviation-related PC software worth mentioning -- although not shareware and therefore not legally copyable -- include the following:

Tracon (Version 2.0) -- Very, very realistic Air Traffic Control (ATC) simulation, it comes with sectors for various locations. Others can be purchased separately. I can't get enough of working this one.

Rapcon -- The military version of Tracon. A good way to learn about military aircraft and related performance.

Chuck Yeager's **Advanced Flight Trainer** -- Excellent presentation of flight training. Program has a scenario where you can fly with the Blue Angels or the Thunderbirds.

Flightsim (Version 4.0) -- I suggest you learn the basics of flight instruction from Chuck Yeager's simulation before tackling this one. Although it does offer flight instruction, it's rather complicated and you'll get more out of this program if you know some of the basics when you try it. It's truly an outstanding sim, however, and has airports and scenery from all over the country built in.

By the way, I'm pleased to announce probably most of you would pass the short quiz in VHF comms we jokingly referred to a few columns ago. No, we're not going to give such a test, but if we did, those who flunked would have to study for the test again by spending at least three hours a day monitoring these communications!

Terminology on the Short Waves

Let's start this month's column by examining aviation communication terminology heard on the HF (shortwave) aero bands. Remember, since it's used on an international basis by pilots, HF aero terminology differs in some respects from terminology utilized on the domestic VHF band. It contains standard words and phrases approved by the International Civil Aviation Organization (ICAO) for use by their member states so there'd be one common lexicon of terminology worldwide. We will have an in-depth look at ICAO in a future column.

ACKNOWLEDGE: Let me know that you have received and understood my message.

AFFIRM: Yes

APPROVED: Permission for proposed action granted

BREAK: I hearby indicate the separation between portions of this message

BREAK-BREAK: I hearby indicate the separation between messages transmitted to different aircraft in a very busy environment.

CLEARED: Authorized to proceed under the conditions specified. This is commonly used when an ATC clearance is read to a flight by someone other than ATC personnel themselves, such as an ARINC radio operator.

CONFIRM: Have I correctly received the following . . . ? or, Did you correctly receive this message?

CONTACT: Establish radio contact with . . . . (As in "Contact Honolulu now on 13354.")

CORRECTION: An error has been made in this transmission (or message indicated). The correct version is . . . .

DISREGARD: Consider that transmission as not sent.

GO AHEAD: Proceed with your message.

HOW DO YOU READ: What is the readability of my transmission?

I SAY AGAIN: I repeat for clarity or emphasis.

MONITOR: Listen out on (frequency).

NEGATIVE: No, or, Permission not granted, or, That is not correct.

OVER: My transmission is ended, and I expect a response from you.

OUT: This exchange of transmissions is ended and no response is expected.

READBACK: Repeat all, or the specified part, of this message back to me exactly as received.

RECLEARED: A change has been made to your last clearance and this clearance supersedes your previous clearance or part thereof.

REPORT: Pass me the following information . . . .

REQUEST: I should like to know, or, I wish to obtain . . . . For example: TWA 10 calling New York ARINC with a request.

ROGER: I have received all of your last transmission. (Just as the FAA's phraseology directory clearly states their position on the word ROGER's misuse in domestic VHF aero comms, ICAO states that "Under no circumstances [is it] to be used in reply to a question requiring 'read back' or a direct answer in the affirmative or negative.")

SAY AGAIN: Repeat all, or the following part, of your last transmission.

SPEAK SLOWER: Reduce your rate of speech.

STANDBY: Wait and I will call you.

VERIFY: Check and confirm with originator.

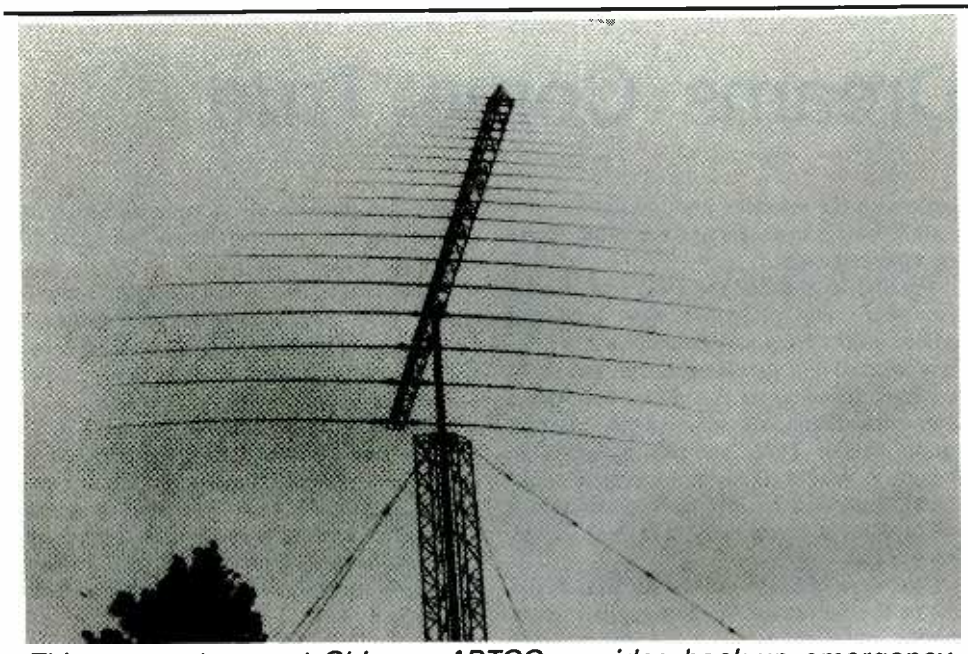
WILCO: (Abbreviation for "will comply") I understand your message and will comply with it.

WORDS TWICE: A. (as a request) Communication is difficult. Please send every word or groups of words, twice.

B. (as information) Since communication is difficult every word, or group of words, in this message will be sent twice.

In addition to the above, you may often hear references to frequencies as primary and secondary. This is rarely if ever used in VHF communications. However, it is extremely necessary when using shortwave as one frequency may become unreliable/unusable due to heavy traffic, propagation conditions, or other reasons. Consequently, a backup frequency must be provided.

Primary frequency: The radiotelephony frequency assigned to an aircraft as first



This new antenna at Chicago ARTCC provides back-up emergency communications.

choice for air-ground communication in a radio telephony network.

Secondary frequency: The radiotelephony frequency assigned to an aircraft as a second choice for air-ground communication in a radio telephony network.

As an example, you may hear a Honolulu ARINC operator tell a pilot to use 5547 as his primary frequency and 3413 as his secondary in case he cannot make contact on 5547.

Reader's Corner

Huh? Who's that? Air-who? What airline did he say that was?

How many times have you been monitoring the airbands and wondered just who that strange call sign belonged to as you know for sure it wasn't listed in any monitoring guide you ever read? Well, friends, your search has come to an end: read on.

Many readers have asked where they could find an extensive listing of airline radio call signs available to the public. Long-time subscriber and aviation comms enthusiast Bill Battles, New Hampshire, has compiled a 14-page list of ICAO radio call signs for civilian and government aircraft.

Bill has put in a lot of time and research to obtain the latest and most up-to-date information regarding call signs, airlines and government agencies, and where each is based. It's probably the most comprehensive compilation this writer has seen in a long time. You can order yours now for just $5 in U.S. funds or international money order, which also covers postage and handling from: Bill Battles, P.O. Box 133, East Kingston, NH 03827

Bill also shares with us information from a QSL card he received from San Francisco ARINC:

SAN FRANCISCO -- KMA 7		
Transmitters:	(main)	AEROCOM 1330 5 kW Output
	(aux)	AEROCOM 1331 1 kW Output
Receivers:		AEROCOM 2215 and 2216
Antennas:	(xmt)	2 Log Periodic on 140 foot towers at 279 and 222 degrees
		1 omni-directional LP on 90 foot tower
		2 sloping Vs at 250 and 210 degrees
		1 rhombic at 318 degrees
Frequencies:		2869, 3413, 5547, 5574, 6640, 6673, 8843, 10057, 11282, 11342, 13288, 13348, 13354, 17904, 17925, 21964.

Steve G. Thom, N9JVH, Geneva, Illinois, contributed the photo of a new antenna, which was recently installed at the Chicago air route traffic control center. He says that fellow hams at the center informed him that the new antenna's purpose is to provide reliable communications between centers in the event of a major telephone line interruption, such as the one back in 1981 when a fire broke out in a major switching station.

Air traffic control facilities utilize "land lines" for intra- and inter-facility communications. The log periodic covers 3 to 50 MHz with gain. How would you like to have one of those hummers in your yard?

Craig Haggart, Sunnyvale, California, would like to see some space devoted to airline company frequencies in this column. We would like to do this -- but be advised that it would have to be presented by regions. This is because airline companies do not use the same frequencies at every airport they service. Would other readers be interested in this? Let us know.

Livia Pereix sends these frequencies used for HF air/ground comms in India: 3497, 3499, 5547, 5568, 5580, 6533, 6760.5, 8917, 8963

Speaking of frequencies: There's been a lot of activity on the new HF Family E of frequencies which were implemented last June. Serving the central North Atlantic for oceanic air/ground radio telephone communications, they are guarded by New York ARINC and Santa Maria Radio. These frequencies are as follows: 3476, 6628, 8906, 11309.

Despite any rumors to the contrary, San Juan ARINC is not back in operation. All personnel from that station were transferred to the New York Comms facility. As I monitor NY ARINC transmissions while I type this manuscript, yet another pilot asks the radio operator why he can't contact San Juan ARINC. The operator patiently, and for the umpety-umpth time tells him that the San Juan station was closed in November of 1989 and New York is working flights to and from the Caribbean.

Have you made your plans to attend the 1991 *MT* convention, October 4, 5 and 6, yet? Hope to see you all there this year as it's going to be bigger and better than ever.

That's all for this column. Next time we'll look at foreign airline frequencies, Delta and Cactus (American West), and other goodies. Until then, 73 and out. mt

LEWIS RIVER BROADCASTING

Dreams Come True

How would you like to own your own AM and FM radio station? You don't need a lot of money or FCC licenses. All you need is some knowledge and skill about the broadcast business and a little luck. If you think you've heard this tale a million times before, read on. Dreams can come true.

Nine months ago, Jerry Gaule was looking for a way to make a living in the world of radio. After attending a broadcasting school and Mount Hood College, he worked for eight years in a variety of radio stations near his home in Battle Ground, Washington. Jerry slowly gathered experience and professional contacts knowing that he would run his own station some day.

Established radio stations usually cost hundreds of thousands or millions of dollars to buy. If you want to start from scratch, obtaining a construction permit from the FCC and building a station can be equally expensive. Jerry had an edge over the competition. He reads *Monitoring Times*.

"I had the idea originally about three years ago. I knew there were ways to get on the air, but I had no sources of information." Gaule found inspiration after reading about WDFH, Dobbs Ferry, New York, featured in June 1990's "American Bandscan." A long telephone conversation with WDFH station manager Marc Sophos left Jerry determined to make his dream come true in Battle Ground, Washington.

No license is necessary for an AM radio station if the transmitter uses AC power lines for an antenna and does not radiate beyond FCC specifications. Broadcasting via AM carrier current was Jerry's ticket into his neighbors' radios.

Gaule's next stop was the library, and no stone was left unturned. Jerry studied technical data to discover the clearest frequency in his area to broadcast on, and read FCC Part 15 to ensure his station would operate legally. Gaule approached his town government and was granted a business license for his new operation last November 8. John Tiedeck at LPB, Inc. of Frazer, Pennsylvania, helped Gaule with the selection and installation of a small 30 watt transmitter and matching power line coupling unit.

Finally, Jerry called the FCC and asked if there were any plans for new broadcast stations on the frequency he picked: 830 kHz. They assured him the slot was free and clear, and Jerry followed up the phone call with a letter describing his new carrier current station to the FCC, and his intention to operate it. With a financial backing of about $14,000 provided by his parents, everything was "go" for a launch Dec. 17, 1990. KJGY was born.

"We were officially on the air that day at 5:30 in the morning. We had a great grand opening ceremony later that day with a ribbon cutting and a party provided by the local Chamber of Commerce. It was really a blast."

To add another professional touch, Gaule linked KJGY with the Sheridan Broadcasting Network. "I was looking through *Broadcasting Magazine's Yearbook* for a possible satellite network affiliation. It would make us look good and established, so I went through everyone in the world. I had already installed a 10-1/2 foot dish and an analog Panasonic satellite receiver at our transmitter site to pick up the programming.

"I called Sheridan and explained my station to them. After a couple of phone calls, and a little negotiation, they sent me contracts and it was all set. We play their top of the hour news about 12 hours a day, and their sportscasts 20 minutes after the hour." The affiliation with SBN cost Gaule nothing. SBN airs commercials that they have sold over Gaule's station, and he gets the shows for free.

The station became enormously successful and Gaule grabbed the opportunity. "In our second month of operation I decided we should go beyond Battle Ground. People were constantly calling us and seeing features about us on TV. We had two television stations cover what we were doing. The TV stations heard of us through reports about us in four local newspapers." Jerry remembered the advice of WDFH's Marc Sophos: Use a cable TV system as a medium to broadcast. Gaule began talking to Columbia Cable, his local cable TV company.

"When I get on a whim I don't stop. I just get on the horn and say, 'Can you? Will you?' So I said 'How can I get on your FM lineup?'" Many cable television companies provide not only TV services, but FM service as well.

"After two weeks they finally made the deal. We had another phone line put in and we were up and going on FM. The cable company supplied the modulator, a small transmitter providing KJGY's cable FM signal, and gave us air time in exchange for mentioning that we operate on 94.1 MHz via Columbia Cable FM."

Jerry Gaule had done it again. Another clever barter trade agreement with no money exchanged. "The cable FM serves all of Clark County, about 46,000 people, and it even penetrates nearby Portland, Oregon."

One important component of KJGY's success story is their programming. Many country and western stations fill the dials near Battle Ground, so Gaule decided on a solid gold oldies format, featuring the biggest hits from *Billboard Magazine's* Hot 100 charts from 1954 to 1979. Talk is kept to a minimum, and you'll hear lots of music. "We call ourselves 'The Official Good Times and Great Oldies Station.'"

Community oriented news and weather are aired, and Jerry sometimes calls in live traffic reports with his cellular phone, to his morning DJ "Jammin' Joe" Beuselinck. Local news reports are prepared from information gathered by three daily papers. "Our average audience is between 25 and 45 years old and is growing every day," claims Gaule.

"We're able to make expenses through advertisements. We charge $6 for a 30 second spot. Our staff includes a secretary, myself and my mom. I have three part-time disk jockeys who are volunteers, and a sales manager." KJGY costs $4,500 a month to operate, including rent on a three-room studio complex, and is already breaking even comfortably. "I'd like to see the station become a full-time operation when we improve our financial backing," says Gaule.

If you want to follow in Jerry Gaule's footsteps, first listen to his advice: "Do your research. Do your homework. That's the most important thing. Fortunately, I had some equipment and a background in radio. That's a big plus, too. You have to know what you're doing. I just happened to be there at the right time, the right minute, the right second, the right everything. I don't think it would be sensible to just jump on the air and not know what you're going to do. There's a lot of responsibility behind it. I'm in charge of this ship and I have to know how to steer it. Learn as much as you can about the business.

"I wanted to give this town a good image and be a public servant, so we've developed a good community connection between myself and the town." Who knows what the future will bring for Jerry? "I got a call from Salem, Oregon's Visitor's Bureau. They wanted to set up a low-power station and they asked me to help as their consultant. I guess I've put Battle Ground on the map."

Jerry wants to continue making *Monitoring Times* the source for information about

community radio. Says Jerry, "Read the June and September 1990 editions of 'American Bandscan,' and write me if you need some help." You can contact Jerry at Lewis River Broadcasting, 416 East Main, Battle Ground, Washington 98604. Be sure to include a self-addressed stamped envelope. Maybe your dreams can come true, too.

Be an American BandScan Reporter.
See any stories about radio in the local paper? Send them to Monitoring Times, P.O. Box 98, Brasstown, NC 28902.

Bits 'n' Pieces

■ "The great music of WJIB is back. Boston has lost its greatest radio station, but you can enjoy their great music once again -- in crystal clear stereo," chimes a phone message when you call Carson Radio Services of North Kingston, Rhode Island. The ratings for WJIB were not good enough to keep their beautiful music format on the air, but if you miss the sound, you can order three one-hour cassettes featuring 48 artists once heard on the station.

"We had the music here already. The problem was getting the rights to the various songs and artists so we could put out a tape," comments Carson vice president Paul Temple. "We punched up WJIB one night when we were in the Boston area and it was gone. So, we decided to give this idea a try."

The small firm produces tapes of beautiful music for airing on over 20 stations nationwide. If you'd like to hear the sounds of WJIB, just call 617-498-9777.

■ "Pig Radio" has finally gone back to the mud. For many years listeners in Santa Cruz County, California, have listened to what the locals refer to as "Pig Radio." It all began with a legendary free-form station called KFAT back in 1975. When KFAT failed and left the air, KPIG continued their format by pumping out 3,000 watts of "high cholesterol" programming daily to the area.

A truly crazy station, KPIG has been reduced to bacon fat. A satellite dish has been placed on the roof, and a new adult contemporary format has replaced the commercial parodies, slightly poor taste jokes, and outrageous disk jockeys. Thousands of listeners called their phone-in "Swine Line" asking station management to coninue the fun, but it was too late.

"We played just about everything not usually played on normal radio stations," said KPIG owner Laura Hopper, "but we just didn't have the advertising support." The KPIG music mix was usually country-flavored featuring artists like Merle Haggard, Commander Cody, Reba McEntire, and The Grateful Dead. May KPIG rest in peace.

Mailbag

■ No human beings are necessary at KSTZ-FM in St. Genevieve, Missouri, a suburb of St. Louis. The contemporary hit radio station pulled the plug on its format and replaced it with a droning computer voice with a monotonous countdown of numbers. If you recall the voice of Star Wars robot C3PO, you can imagine what it sounded like.

19,173 19,172 What is going on with this countdown thing, and what is going to happen when it reaches one? The message went on for days and days. *If you think this is different, wait until the countdown is over. A new radio station is coming.*

What eventually appeared was the new KFXK, an adult contemporary radio station known as "The Fox." St. Louis might enjoy this better, but now there is a robot DJ looking for work. Thanks to reader Phil Hinson for his turbo feed of this data.

■ If you like the kind of radio that glows in the dark, *The Hollow State Newsletter* is for you. *MT* reader Ralph Sanserino produces this quarterly publication packed with modifications, reviews, and news about owning classic tube gear. If the model numbers R-390, SP-600 or HQ-180 mean anything to you, you are sure to enjoy this unique work. It covers all tube-type communications receivers and accessories for them. Subscriptions are $5 a year from Ralp Sanserino, 11300 Magnolia #3, Riverside, California 92505.

New Station Grants

Here's what's new on a radio near you. Centre, AL 105.9; Uniontown, AL 107.5; Paradise Valley, AZ 105.9; Texarkana, AR 104.7; Fresno, CA 99.3; Redding, CA 88.1; Coral Cove, FL 107.9; Palm Bay, FL 90.3; Marion, KY 102.7; Williamstown, KY 106.5; Duluth, MN 97.3; Indian Springs, NV 99.3; Rochester, NY 105.9; Columbia, TN 88.7; Paris, TN 94.1; Petersburg, VA 100.3; Neillsville, WI 92.7.

For Sale

It could be the deal of a lifetime. AM stereo radio station WAYX, in Waycross, Georgia, is being offered *FOR FREE* to any qualified person who will lease nine acres of real estate from its current owner. The property includes a marble studio and transmitter building and a new satellite automation system. You'll pay $2,000 a month for a full-time radio station. Call 615-832-2335 for details.

Another good choice as your first station could be in Dodge City, Kansas. A one kilowatt full-time AM station is available for $65,000. It includes an excellent studio facility and four and a half acres of property including two antenna towers. The station is currently dark and silent, but it's ready for new life. Call Stu Melchert at 316-624-3891.

What if my MT is late?

If your copy of *MT* doesn't show up on your doorstep, give it until the 10th of the month, and then call us. We can replace up to two issues per year, but give the Post Office a chance!

International Bandscan

■ The Australian government has proposed a complete ban on all political commercials broadcast on radio and television. In past election campaigns, the commercials have been filled with "asinine jingles, characters and half-truths," according to Ian Lothringer, in a letter published in *The Sydney Morning Herald*. If adopted as law, the ban would cover the upcoming 1993 national election, state and local elections and any messages from private groups concerning candidates or political issues.

■ For several years, following a dispute between Spanish and French co-rulers of the principality, there has been no radio station in Andorra. The former Radio Andorra closed completely and Sud Radio moved its transmitters across the border to France. Now Radio Andorra has begun transmissions on 94.2 MHz with two kilowatts and eventually hopes to be able to resume a mediumwave and shortwave service.

Credits

Thanks to *Broadcasting Magazine, The M Street Journal, The Boston Globe* and *The New York Times*. Thanks to readers Ron Carruthers, Malcolm Kaufman, Phil Hinson, Ralph Sanserino and The British DX Club. Until next month, happy trails.

Zoning Laws:
Fighting City Hall

It's another one of those hot, early summer days. You've just dug a four foot deep hole, set a 10 foot steel pipe and filled it up with concrete. On the ground around you are the pieces of your new 10 foot parabolic satellite television dish, ready to be assembled.

Troweling the last of the concrete, you're thinking about watching your favorite baseball team or listening to Radio Canada in stereo or setting up your computer to receive X*Press X*Change and all the wire services from around the world.

Your reverie is interrupted by a rude noise. It's your neighbor, Mr. Stink, hollering at you from his side of the thorny hedge which divides your property. "What are you working on there, big buddy?" he croaks. You can smell the whiskey 20 feet away.

"Putting up my new satellite TV system," you shout back over the din of his dog kennels. He laughs derisively and spews a stream of tobacco juice in the direction of your lilac bush. "Don't you know there's a town ordinance against them big ol' ugly things?"

What to do? This is often the first notion that a new dish owner has to the fact that a local municipality has decided it knows best what kind of information and entertainment you should have access to. If you think this kind of thing happens only in Third World dictatorships, you'd better think again. Thousands of local governments in America, with the enthusiastic assistance of their local cable companies, have written wide-ranging laws forbidding Americans from using their *private* property for the installation of *private* satellite TV systems for their own *private* enjoyment.

It is hoped that citizens will be intimidated by these laws and will publicly apologize for the indiscretion and sign up with the cable company and its ever increasing rates and decreasing service.

You should know that such laws are illegal and that you can fight them.

FCC to the rescue

On February 5, 1986, the Federal Communications Commission released a ruling known as Docket No. 85-87: "In the matter of preemption of local zoning or other regulation of receive-only satellite earth stations." This is a 22 page document. Details on how to obtain copies of this docket are given in Table I. It finds the following:

"State and local zoning or other regulations that differentiate between satellite receive-only antennas and other types of antenna facilities are preempted unless such regulations -- a. have a reasonable and clearly defined health, safety or aesthetic objective, and b. do not operate to impose unreasonable limitations on, or prevent, reception of satellite delivered signals by receive-only antennas or to impose costs on the users of such antennas that are excessive in light of the purchase and installation cost of the equipment."

This ruling is U.S. law. The upshot is that local governments can't discriminate against backyard dishes if they allow any other kind of antenna. This forces the locality to pass even more ridiculous laws which risk further violation of the U.S. Constitution, to say nothing of inciting the populace to extreme agitation.

American Satellite Television Alliance

Very often merely submitting a copy of Docket No. 85-87 to your local zoning board in your defense is enough to make them back down. In the event of continued stubbornness you may wish to have more legal documentation at hand.

The American Satellite Television Alliance, formerly known as The American Home Satellite Association, has a zoning package available for home dish owners. The package, produced by their legal counsel, contains pertinent documentation, including case citings, concerning these illegal regulations. The package is $40 and can be ordered from the address in Table I.

FCC: Asleep at the wheel

Despite all of the above, the FCC, unknown to most zoning boards, has been in a coma since the ruling. Relying on its long shadow, the Commission has apparently never actually enforced its own rule. It seems, however, that the Commission has just gotten the wake-up call from a dish owner in Deerfield, New York, named Joseph Corino.

Corino, in a pending petition, has asked the FCC to intervene on his behalf and invoke Docket 85-87. It appears the request has had an effect. A spokesperson at the Commission said they were expecting a ruling later this year regarding the Corino petition.

TVRO future is in the balance

The future growth of the satellite television industry could well hinge on the outcome of the Commission's ruling. Zoning regulations are often written to encompass all nontraditional structures, says Court Newton, director of the American Satellite Television Alliance.

"This means," says Newton, "that the size of the dish doesn't matter." New, smaller DBS Ku or C band dishes would run the same risk of being banned as the current 10 foot dish standard. With a favorable Commission ruling and a sweeping dismissal of current anti-dish laws, the flood gates to urban home dish installations will open. While it may not sound the death knell for cable, it would certainly bring forward much needed competition.

Restrictive covenants

Separate from zoning restrictions are restrictive covenants. These are not laws but legal restrictions which are written into the deeds of property. Unless you pay very close attention to the fine print of your property deed, you may not know that you are restricted by the covenant of the deed from erecting an external TV antenna, satellite dish, amateur radio antenna or clothes line. Battling the restrictive covenant, while not futile, will prove to be more of a challenge than the local zoning ordinance.

The American Radio Relay League (ARRL), a national organization for the promotion of the amateur radio service has published a good bit of information on the subject of zoning regulations and restrictive covenants as pertains to amateur radio. This is important to the TVRO enthusiast because the Commission states in Docket 85-87: " . . . Our objective is to ensure that satellite receiving antennas are not treated less favorably than other antenna devices such as amateur radio antennas . . . ."

There should be a more sympathetic relationship between such organizations as the ARRL and ASTA and more effort in support of each other's cause.

Table I

FOR MORE INFORMATION

In the old days a letter to the FCC would have resulted in a copy of a particular document being sent immediately and free of charge. Now that the government is off the backs of the taxpayer, business has climbed on and those of us who seek such information are obliged to pay. The Commission refers all such inquiries to a company called Downtown Copy Center, Telecommunications Consultants. There they will be happy to research your information, at $15 per hour, and copy it, at 7 cents per page. Postage, of course, is extra.

The ARRL publishes "The FCC Rule Book – A Guide To the FCC Regulations" which it sells for about $10. At nearly 300 pages, it is quite a bargain. Included is the full text of PRB-1, a Memorandum Opinion and Order "In the matter of federal preemption of state and local regulations pertaining to amateur radio facilities . . . ." It was released September 19, 1985.

Other Sources:
Federal Communications Commission, 1919 M Street, N.W., Washington D.C. 20554, phone: 202-632-7000, satellite branch: 202-634-1624.

Downtown Copy Center, 1114 21 Street N.W., Washington D.C. 20036, phone: 202-452-1422

American Satellite Television Alliance, Court Newton, director, 16 Broadway Suite 400, Valhalla, N.Y. 10595, phone: 914-997-8192, FAX: 914-948-6217

American Radio Relay League, 225 Main Street, Newington, CT 06111, phone: 203-666-1541, FAX: 203-665-7531

MAILBAG

Matthew Lightner of Claysburg, Pennsylvania, writes *" . . . I have discovered Morse code on the TVRO satellite Galaxy 6. Can you let me know what it is?"*

Matthew, by the time you read this, you'll find Morse code on every channel which has a video signal. It's called the Automatic Transmission Identification System (ATIS) and has been mandated by the FCC to be uplinked automatically by all satellite transmitters. The signals are sent on 7.10 MHz at 25 words per minute and carry the earth station call sign, phone number, and serial number of the transmitting equipment.

Thanks to Steve Kimmel of Glendale, Arizona, for the reprint from *Network World* describing the feud between current users and hopeful users of the two GHz microwave band.

TVRO owners have long suffered the effects of terrestrial microwave users, most notably long distance phone companies, operating in the same frequency band as the domestic C band communications satellites. For all the frequency spectrum available there is always a great deal of wailing and gnashing of teeth over available spectrum.

Just how much room is there? To see for yourself get the radio spectrum frequency allocation chart published by the National Telecommunications and Information Administration. This 32 by 50 inch full color chart is only $2.75 each from the Superintendent of Documents, U.S. Government Printing Office, Washington D.C. 20402. Or call them at 202-783-3238. Ask for reference stock number 003-000-00652-2.

Thanks to a reader in Boston, Massachusetts, for the articles from the Boston *Globe* detailing tribulations of Boston Celtics owner Donald Gaston who is trying to install an 8-1/2 foot satellite TV dish atop his home on Beacon Hill. Seems he has run afoul of the sensibilities of his neighbors who claim it would just ruin everything.

Thanks also to Frank Vacanti, of Boulder, Colorado, for a reprint from the Denver *Post* on digital radio via satellite and to the many others who sent clippings from their local papers regarding satellite related activities. Your information is always appreciated.

Transponder Notes

According to a report in *Satellite Business News*, programming which had been on Satcom C1 has been forced to move to make room for increased nonvideo traffic to Alaska. The Denver Netlink stations have moved to Satcom F2R and the regional sports programming has moved to T303.

Look for ABC to scramble its network feeds on T301 and T302 by fall.

PBS is said to be interested in video compression technology. Currently on S1 it is slated to move to T401 when it is launched in early 1993. Viewers should have their Ku equipment in place by then as PBS will have five Ku and one C band on the new higher-powered bird.

Ike Kerschner, N3IK

How Much Does it Take?

Just how much does one need to have fun in Amateur Radio? Too often I hear would-be amateurs express the feeling that they cannot afford a ham station. The truth is that anyone with fifty or so dollars to spend can get on the air and have a good time talking to hams all over the world. Now, if you insist on being heard the first time every time then that figure is going to move upward rather rapidly.

From the very beginning of ham radio, the idea was to see who we could talk to. To that end some amateurs built kW stations with huge antennas to ensure their signal would be heard without fail. But, for the average ham it was enough to simply work a station a few hundred miles away from time to time. That was the excitement and intrigue that kept us going. I am sure that if everyone who got into the hobby decided that a kW was required there would be a lot fewer active amateurs on the air.

For normal day to day HF operation a transmitter or transceiver capable of 50 to 200 watts is quite adequate. Simple dipole, end fed wire, or vertical antennas provide world-wide communications (depending on band of use). In fact a lot of amateurs never use more than five to ten watts of power and enjoy the hobby more than their kilowatt brothers.

Six Meters
(or, It's a Bum Rap)

Six meters has been given some pretty bad press over the years, due mainly to the old channel two TVI problem that plagued six meter operators. For many years it was difficult to operate this band in an area where TV channel two was active, due to the proximity of six meters to that particular TV channel. Fundamental overload was the greatest problem, especially in fringe areas!

Even in those days of yore it was not impossible to cure the problem, but it sure was tough! Today cable TV makes the problem pretty much a thing of the past.

Good Long Range Simplex

On VHF we run into a problem called "Shadow Effect." This is due, as the name implies, to a blocking of the signal by hills or buildings; As we go higher in frequency, cars and trucks as well as individual trees and wires will also interfere. As you can imagine this can be a very annoying problem at some frequencies.

Six meters is the *least* affected VHF band by this condition, making it a good band for long range (30+ miles) simplex operation (simplex means both stations are operating on the same frequency).

Under normal conditions two base stations running low power (5 to 25 watts) can expect good reliable communication over a range of fifty miles or so with simple antennas. Going to a decent Yagi or quad antenna of three elements or more will increase that reliable range up to about two hundred miles (assuming the stations do not have a major mountain between them, of course).

When conditions are good (that is, when sunspot numbers are high), communication with stations half-way around the earth is easily possible to an average station (ten to one hundred watts and a beam antenna of at least three elements operating on SSB). Even during periods of low sunspot numbers there will be frequent openings on six meters of over 1500 miles due to a variety of propagation conditions such as sporadic E.

Consequently, six meters is a very interesting band, and one that has largely been ignored by the amateur community due to largely undeserved bad press.

What do I need to work six?

Most gear on six meters will run less than one hundred watts, though there are as always higher power stations (they do indeed do better). Commercial gear for SSB, CW and AM is manufactured by ICOM, Kenwood and Yaesu. All work well, and it is only a matter of deciding which you want. Most of these rigs are also capable of FM operation, which is very popular on six. Prices are fairly high averaging somewhere in the thousand dollar neighborhood.

It is of course possible to purchase used gear at a ham fest, or to build your own gear from scratch. For the most part home built gear is usually CW or AM. However, it's not beyond the expertise of the average amateur to build an SSB station if he is willing to invest the time and money.

FM

As far as I know, there is no manufacturer building strictly FM rigs for six meters. Should FM be your main choice, then I suggest calling your local two way radio service center and asking to purchase used commercial gear. Many service stations will sell gear as is or repair it and place it on frequency for you.

Of course if you choose the ready-to-go option it is going to cost a few bucks ($200 up). If you can obtain a unit in good condition that was working when taken out of service, it is normally only a matter of putting it on frequency and aligning it. Do get a service manual before you make the purchase, though, to see what you are getting into.

If you lack experience in the field, have a friend who knows what is going on help you get it going. Most commercial gear will put out 50 to 100 watts and be excellent quality. I suggest you stay away from General Electric gear built in the 50's and 60's and labeled TPL; they are a nightmare of cables which are difficult to keep in repair.

Most stations run four element Yagi or quad antennas on CW, SSB or AM; on FM simple quarterwave ground plane or J pole antennas are very popular and do an excellent job. A six meter quarterwave antenna is only about five feet long (halfwave is ten feet, or about the size of a TV channel two antenna). It's relatively easy to get a nice antenna up for this band, and an inexpensive TV rotor will easily turn up to a five element Yagi.

Modes of operation

Amateurs are allowed to run all transmission modes legal on the lower bands on six meters. The most popular modes in order of preference are SSB, FM, Packet, AM and CW. There are some RTTY stations on the band, but only a small number, and while I have never heard nor seen any, I understand some stations are on SSTV too.

So come on all of you new Techs, get on six meters and join the fun!

Propagation

The sun continues to act like a rubber ball, with conditions bouncing from very good to non-existent! During March strong solar flares caused the HF spectrum to be blacked out for several days (March 24 & 25). However the bands bounced back with superb conditions.

Look for the solar flux to hang around 175 to 190 on the average with a steady decline as summer progresses. There is still a lot of life in this cycle and conditions on 10 and 6 meters should continue to be very good for at least the next year or so.

Working the Space Shuttle

Shuttle mission STS-37 was by far the most exciting shuttle mission for ham radio to date, with five hams in the crew: Pilot, Ken Cameron KB5AWP, Commander Steve Naagel N5RAW, and mission specialists Linda Godwin N5RAX, Jay Apt N5QWL and

Rob Leverich's Ham DX Tips

You say that you checked your bank account and found that the only vacation you can afford this year is a camping trip to the back yard? No problem, you can take a world trip via the ham bands and get to meet some nice people from some interesting spots. And, there is no better place to start than the cool island breezes of .....

BARBADOS A 12 meter regular is 8P6CC who can be found around 24950 kHz daily at 1900 UTC. (QSL to: Richard Winston, Upton Terrace, Saint Michael, Barbados). For those who can copy RTTY signals try 15 meter's RTTY segment (21075 to 21098 kHz) most days starting at 0130 UTC. Reports go to his QSL manager: K4BAI, John T Laney, P.O. Box 421, Columbus, GA 31902.

GREECE Another country that can be logged by RTTY enthusiasts. Look in the 20 meter band RTTY segment (14075 to 14098 kHz) for SV8AJN at 2200 UTC. QSL to: Hristomalusis 8, 81100 Mitilini City, Lesvos Island, Greece.

LATVIA CW fans should check the 30 meter band 10101 to 10105 kHz daily around 0415 UTC for YL2PQ.

LITHUANIA LY2WW has been appearing on 15 meter's RTTY segment at 1630 UTC daily. If you can't copy RTTY try 21335 kHz at 1500 UTC when he joins the DX net here for some SSB contacts. QSL to his QSL manager: Richard C High, 740 Galena, Aurora, CO 80010.

NEPAL 9N1MM is Father Moran, and he has been the only active ham operator from this rare country for many years, delighting many a DX'er with a logging. You can log him on 14253 kHz either at 0100 or 1200 UTC daily. Reports go to his QSL manager N7EB, Edward M Blaszcyk, 1282 Sun Valley Dr., Sun City, AZ 85351.

PAPUA-NEW GUINEA Having recently started a 3 year assignment here is P29DX (whose home callsign is G4JVG back in England). He hopes to keep regular schedules on: 28485 21285 14185 7085 and 3798 kHz. His address: Steve Telenius-Lowe, Spectrum Management Dept., PTC, P.O. Box 1783, Port Moresby, Papua-New Guinea.

PERU One of the more difficult countries with a large resident amateur population to log. But, you can log OA4DX Mondays on 21250 kHz at 0400 UTC and sometimes he appears on the 40 meter DX group's net 7159 kHz at 0615 UTC. Reports go to: Carl Dee Bethel, Manuel Bonilla, 125 6 Miraflore, Lima, Peru. OA4CRK appears on 12 meters 24950 to 24965 kHz at 2230 UTC. Unfortunately we do not know his QSL information.

SAO TOME D44BS (Angelo Mendes, P.O. Box 308, Praia, Cape Verde Islands via Portugal) recently said that he hopes to obtain an S9 (Sao Tome) license and operate from here in July. This is very much a rare DX country, so check those large "pile ups" of calling stations.

July 1st is Canada Day, and every year the Canadian Amateur Radio Federation sponsors an Amateur Radio contest on that day (starting at 0000 UTC and running for 24 hours). Look for many special stations and unusual prefixes on: SSB-1875 3775 7070 and 7155 14150 21250 and 28500 kHz CW-1825 3525 14025 21025 and 28025 kHz.

'Til next time 73 de Rob.

Jerry Ross KB5OHL. Operation was to be mainly on FM and Packet.

Future flights will use the same set-up as STS-37, and working the shuttle will require the ability to work split operation. Listen on 145.55, the down link frequency (the frequency the shuttle will transmit to earth on). Your transmitter should be operating on one of the uplink frequencies of 144.95, 144.91 or 144.97 on the FM mode. The packet downlink frequency is 145.51 with uplink frequencies of 144.93 and 144.99.

Remember if you transmit on either 145.55 or 145.51 your signal will interfere with other stations attempting to hear the shuttle, so be sure to set the correct split on your rig!

No Code

Every day more No Code techs are coming on the bands and enjoying amateur radio. I enjoy chatting with these newcomers to the hobby and watching them find pleasure in their new hobby.

I hope the many clubs out there are welcoming the new hams and helping them find their way in our wonderful but often complex hobby. Here is a source of man (woman) power we should all quickly tap into to help our clubs and the hobby grow stronger!

That's all for this month gang; remember this is your column so write and let me know what you would like to see on this page.

73 de Ike, N3IK

Dr. John Santosuosso

P.O. Box 1116
Highland City, FL 33846

Radio Caroline: *Down, but not quite out?*

No licensed station has ever had the impact on legal broadcasters that Radio Caroline has had. "The Lady," as she was known, not only changed British and European broadcasting permanently but also for the better. Recently, however, The Lady has fallen on difficult times. As we reported not very long ago, new British legislation stopped Caroline from making broadcasts from the M.V. Ross Revenge. And an act of Parliament gave British authorities the right to board the vessel at any time, even though it is anchored in international waters.

Meanwhile England's Martin Lester tells us a strange and unusual truce has developed. No broadcasts are coming from the Ross Revenge. In return the government is currently leaving the ship alone and permitting it to be supplied and refitted from the United Kingdom. For several months Caroline was taping programs on the ship which were then being transmitted legally by the same satellite used by ex-Irish pirate Radio Nova.

Currently these also have ceased, although we do not know why. It appears the ultimate hope of the Caroline organization now is to sail to the North Sea with a license from a Third World country and broadcast from there. Possibly in return Caroline would grant the friendly nation free air time.

What the reaction of the British and other area countries would be is not clear at this time. However, I expect it might be less than friendly. Certainly, the Honduran registry held by Radio New York International's Sarah did little to provide it with protection from government harassment. Perhaps Caroline might still follow through on the rumored WWCR relay.

Meanwhile, if you want the latest Caroline news direct from the Caroline organization you can call 011 44 836 404539. Martin warns this is a premium rate service and very expensive, even in the UK.

Fading British Pirates

It appears that the 1991 Broadcasting Act has frightened away most of Britain's numerous FM pirates. A few shortwave operations still remain and with some patience and luck these can be heard in North America. They include Britain Radio International, 6230; WKNR West and North Kent Radio, 6275; Radio Orion, 6290 and WFRL Wonderful Free Radio London, 6310.

By the way. We've got a very special announcement about British Pirate WKNR: They plan a test transmissions to North America over the next several months. Be looking for it on 15808 kHz. We are sorry, but we have no further details at this time.

Meanwhile unlicensed UK stations have been making it to the shores of North America. The special test of the Northern Ireland Relay Service was monitored by Bob Thomas in Connecticut. It also found its way here into Central Florida on 6273 at 0402 UTC. What makes this station especially interesting is that there is no legal shortwave service from either Northern Ireland or the Irish Republic.

Thanks to Terry Krueger, I did not miss the Dutch Radio Tower booming in at near local level on 15050 kHz in USB at 0219. The station apparently normally uses 6240 for its transmissions, but went to the higher frequency for the highly successful special broadcast of several hours. This program included a fascinating excerpt from a broadcast of a long-defunct offshore commercial pirate, Radio England.

Clandestine Stuff

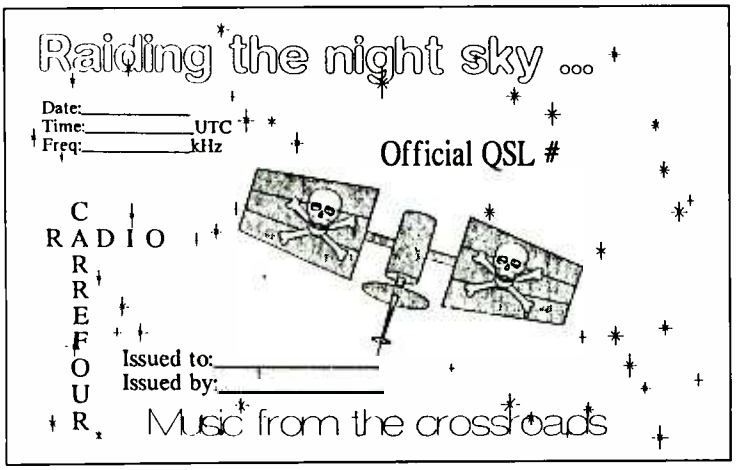
Still another anti-Castro broadcaster has taken to the airwaves with the assistance of a legally licensed station, in this case WWCR. Look for a program entitled "Esperanza (Hope)" on 7520 a little after 0000 UTC days Tuesday through Saturday. The sponsoring organization is La Voz de los Municipios de Cuba en el Exilio. Its address is 4600 NW 7th Street, Miami, Florida 33126. With most Cuban exile groups, English is satisfactory for your report, but a prepared card and return postage might help you get a reply.

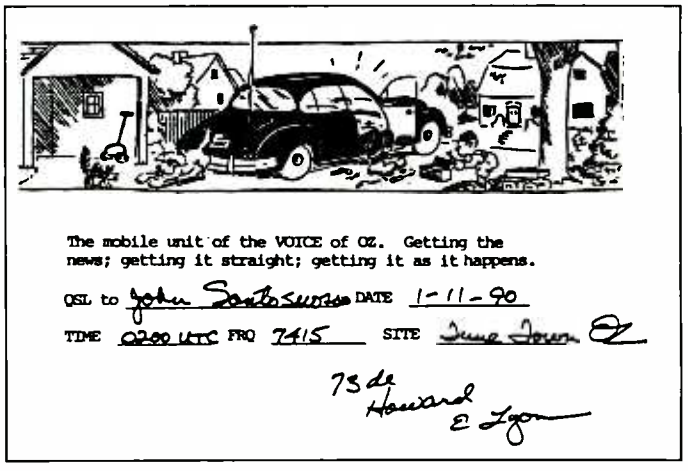
There is a new shortwave broadcaster that might be attractive to anti-Castro organizations looking for air time. According to Bob Thomas, Radio International should be testing on both 9950 and 15055. Around 0400 is one possibility for this one.

I was amused recently to hear NBC News finally declare what shortwave listeners concluded months ago when the station first took to the air. The Voice of Free Iraq is CIA-sponsored. Broadcasts appear to originate from Egypt. Lately it has been signing off earlier, but you should find it putting in a reasonably decent signal on 17960 until sign off around 2320.

The station could ultimately prove to be a source of embarrassment to the Bush administration. Broadcasting in both Arabic and Kurdish, it called for uprisings against the Saddam Hussein government. When Shiite Arabs in the south of Iraq and Kurds in the north did revolt, Washington did nothing to help them and thus made their defeat almost inevitable.

The Iraqi situation is so fluid it is possible a number of clandestines could pop up, then disappear, and return once again days, weeks, or months later. Bob Thomas sent us some information on several that have been heard





recently. The Voice of the People of Kurdistan has shown up in Kurdish and Arabic on 3960, 3965 and 7030. The Voice of Rebellion or Voice of Rebellious Iraq is believed to be originating from the vicinity of the southern Iraqi city of Basra. Try 7097 around 0430, 1230, or 1730. There appear to have also been some anti-Iraqi broadcasts on 7435 from 0930 to 1035 and 1430 to 1500.

If peace does come to Kampuchea, the clandestines broadcasting to that troubled land should disappear. Meanwhile, I have been hearing with reasonably good signals Voice of the Khmer on 6325 kHz around 1200 or earlier. This station is normally a good verifier. Reports can be sent to Khmer People's National Liberation Front, Post Office Box 22-25, Ramidra Post Office, Bangkok 10220, Thailand. For those of you on the west coast, this one should prove rather easy.

Clandestine Telephone

Want the latest news on the rebellious Soviet Baltic republics of Latvia, Lithuania, and Estonia? You can call the Baltic Hotline at 301-340-8174. Sponsoring this service are the American Latvian Youth Association and the Joint Baltic American National Committee. Please note, this is not a free call.

Closer to Home

Pirate activity may have slackened somewhat, but *MT* readers are still managing to get some nice logs. Our first is so unusual, and perhaps of such a sensitive nature, that we are not going to mention the reporter's name. I have already eaten, with ketchup, his letter.

He writes, "At 2053 UTC on 7415 I heard a most strange broadcast. It seemed to be one side of a phone conversation. The voice seemed to be an FCC agent tracking pirate broadcasts. He was saying things like, 'They're so dumb they always use the same frequency,' and 'We're waiting for the numbers from our Miami bureau'." Our reporter wants to know if anyone else has heard something similar. Well, has anyone?

What is a month without some logs from Minnesota's champion pirate chaser, Alan Masyga? As usual, Alan didn't let us down. He found Voice of Anarchy on 7412.9 at 0003 UTC. Not far away, on 7416, WABA made it into Minnesota at 0106. A QSO on 7414.8 turned up, among others, Bulldog and Black D. I cannot help noting Alan's program notes about the Voice of Anarchy. On one occasion it played some Beethoven. Now who says pirates don't provide variety?

We were pleased to hear from Andy Steinberg in Kentucky, who has done quite well recently. Andy found the Canadian CFBN in SSB on 7415 at 2035 UTC. Also in USB on the same frequency was KUSA at 0230.

That is about it for another month. Keep those reports coming. mt

below 500 khz

The World's Largest ELF

The U.S. Navy has created the Jolly Green Giant. It occupies 56 miles of real estate and required 1492 fifty foot telephone poles and hundreds of miles of one inch thick wire to complete. This monster talks to submarines daily. Have Navy engineers been charmed by mischievous leprechauns?

The answer to this mystery lies in a common characteristic of radio waves. Have you traveled through a tunnel, listening to your car radio, and heard the station fade away? Radio signals really suffer when they are asked to pass through dense materials like stone, steel, and water. The ELF (extremely low frequency) was designed to cure the problem.

Using the extremely low frequency of 76 hertz, vital data and instructions can be transmitted to America's submarine fleet reliably to the depths of 400 feet or more. High-tech sophisticated radios, with computerized digital processing, receive the signals using antennas 1,200 to 2,000 feet in length trailing behind the submerged vessels. The ELF system sends three-letter encoded messages to the ships, each character taking several minutes to transmit. ELF radio waves are 2,500 miles long.

Many obstacles had to be met to complete the ELF transmission system located near the town of Republic in Michigan's northern peninsula. Crow-sized pileated woodpeckers found the supporting telephone poles delightful dining. Several poles had to be replaced because of the huge holes the birds created. Deterrent sprays could not be applied to the poles because of environmental considerations. Nearby telephones had to be filtered to prevent them from ringing randomly during ELF broadcasts.

The Upper Peninsula Power Company had to redesign and rework 300 miles of their utility lines to reduce attenuation of the ELF signals. Many other telephone, cable and power companies followed suit.

Environmentalists and residents have protested the ELF project throughout the 22 years since its original proposal, and have lengthened the project's completion time. The extremely low frequency transmissions were feared as a cause of environmental and biological damage. Large expanses of countrysides and woods had to be cleared to make a right-of-way for the construction of the system. Many expensive compromises were reached and the Navy has pledged to continue its "good neighbor" status with Michigan's Department of Natural Resources and the townspeople living close to the antenna farm.

The final result could be considered the eighth wonder of the world by any radio enthusiast, but it is much smaller than originally planned. An underground grid antenna, spanning 2,000 square miles, called Project Seafarer, was first proposed as the ultimate ELF system. Campaigns against ELF by the people of Michigan, a dwindling federal budget, and the realization that even an underground ELF system could be destroyed by severe enemy bombings, forced the Navy to scale down the project to its current dimensions.

Although the ELF facility built in northern Michigan is the largest in the world, the Navy still maintains its original ELF transmission center at Clam Lake, Wisconsin. Clam Lake's antenna farm consists of a 26 mile long array that resembles a tilted cross, built in 1969. The ELF outside Republic, Michigan, the second transmitter site to go on the air, began broadcasting in 1989. Instead of a tilted cross design, their antenna resembles a huge letter F.

Three thick cables run parallel to each other creating the most efficient antenna possible. Fifty foot tall supports, constructed with two vertical telephone poles and a strengthening horizontal crossbar, are placed several hundred feet apart keeping the antenna cables high and away from obstructions. The ELF antenna could easily be mistaken for a power company's high tension distribution system.

The ELF's location is more important than the huge antenna built upon it. Underneath both sites lie enormous plates of Laurentian granite, known for its unusually strong ground conductivity. This allows an electrical loop to be created: The transmitted ELF signals run down the 56 mile antenna that is grounded deep in the earth at each end. The bedrock returns the signal underground creating a complete circuit. The Navy's ELF transmitter effectively uses most of Michigan's northern peninsula as its radiating system.

The messages transmitted via ELF follow a path as complicated as an ELF antenna. From the offices of various commanders at the Pentagon, and naval bases worldwide, instructions to submarines are sent to the Navy Broadcast Control Authority offices in Norfolk, Virginia. The appropriate three letter code is decided upon and relayed to the original ELF transmission site at Clam Lake, Wisconsin, still in active use today. Clam Lake then sends the data to the ELF site at Republic, Michigan, and a synchronous transmission of the pulses from both sites occurs shortly thereafter. Verification of the message's content is performed by a monitoring station nearby at K.I. Sawyer Air Force Base.

The ELF system cost 400 million dollars to construct and one million dollars to operate annually. It has become "a reliable, redundant, continuous and reconstitutable communication system for submarines, according to Vice Admiral D.L. Cooper, U.S. Navy Assistant Chief of Naval Operations. The next time a friend boasts that his antenna is really big, tell him about the ELF.

The Big Stick

The lower you go in frequency, the longer your antenna should be, right? Wrong. In this modern world of light dimmers, computers, answering machines, clock radios, and almost everything else using some sort of CPU chip to control it, noise is everywhere. Unfortunately, a great place to hear it all is on longwave. Very few of us can endure even a short listen to this endless drone of "junk" signals, so experimenters are retaliating.

Possibly the most useful tool to longwave enthusiasts is the active antenna. Household electrical noises radiate mostly from power lines that run horizontally. Vertical active antennas are doing a wonderful job nulling out this annoying stuff and revealing signals otherwise buried in the mire. A very simple design was described by Ken Cornell in the February 1989 issue of *Monitoring Times*. Most consist of a simple single element vertical antenna feeding an active preamplifier, similar to the Sony AN-1 or Grove active antennas for shortwave.

Longwave models use specially designed preamplifiers that filter out signals from above 500 kHz. Powerful AM broadcast stations can create havoc when they enter broadband amplifiers, and filters to eliminate their products are essential for good longwave reception. Some longwave active antennas include very selective tuned circuits to bring noise and interference to a bare minimum.

Longwave wizard Ken Cornell has three identical active antennas mounted in various locations around his house. When he is digging deep for rare DX, he chooses the antenna that provides the best signal to noise ratio. "If I had to use one antenna, it would be this one," says Ken. "Active antennas can make all the difference in the world."

The Low and Medium Frequency Scrapbook is Ken Cornell's excellent guide to experimenting. An updated seventh edition has just been published and it includes all sorts of projects concerning longwave reception and transmission. Send a SASE to Ken for details: 225 Baltimore Avenue, Point Pleasant, New Jersey 08742.

Write Us Today

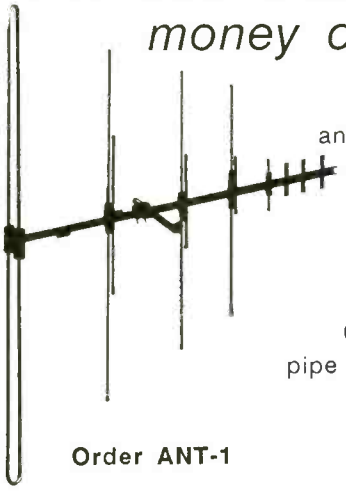
We would love to hear about your experiences with longwave stations and beacons, and see some of your best QSLs. Why not add to our fun and write today to "Below 500 kHz," Monitoring Times, P.O. Box 98, Brasstown, North Carolina 28902. We'll be looking for your letters in our mailbox.

--Karl Zuk

Signal Intelligence: Products for Better Listening

The Grove Scanner Beam

The best scanner antenna money can buy!



- 6-9 dB gain over other antennas. Continuous 30-512, 800-1300 MHz reception.
- Transmit up to 25 watts on 144, 220 and 420 MHz bands. 50/75 ohms nominal impedance.
- Balun transformer, offset pipe and all mounting hardware included.

Order ANT-1

Only **$59.95**

$5 UPS or
$7 U.S. Parcel Post
$10 Canadian Air P.P.

Uniden BC855XLT

New Bearcat desktop scanner includes 800 MHz!

At last, a low-cost scanner with high-performance features! This new Bearcat desktop scanner offers a frequency coverage of 29-54, 108-174, 406-512 and 806-956 MHz (less cellular, restorable) as well as pre-programmed weather search.

50 memory channels in five banks may be scanned or searched at 5 or 15 steps per second. Individual channel lockout and delay, automatic squelch, priority, non-volatile memory and powerful, clear 1.3 watt audio included.

A BNC antenna jack, 18" plug-in telescopic whip, external speaker, wall power adaptor all included at this low price.

Order SCN-8

Only **$209**

Plus $5 UPS shipping in U.S.

Bearcat BC200XLT

Finally, a high performance handheld programmable scanner which includes aircraft and all land mobile bands, including 800 MHz!

Frequency coverage is 29-54, 118-174, 406-512, and 806-960 MHz (less cellular frequencies). 200 memory channels may be stored in 10 banks of 20 channels each or scanned sequentially.

This feature-packed handful offers ten priority channels, search, lockout, and delay and comes equipped with detachable Nicad battery pack, AC charger, leather holster, and BNC flex whip.

The BC200XLT is the most powerful hand-held scanner ever released to the public and is now available from Grove Enterprises at a super discount price!

Extra BP200 battery packs available - 39.00

CALL TOLL-FREE (MC & Visa Only)
1-800-438-8155

Order SCN9

Retail ~~$449.95~~

Grove Discount Price

$259.00

Order SCN 9

$5 UPS/$6.50 U.S. Parcel Post

$7 Canadian Air P.P.

Features may vary slightly from photo

Order Today!

Grove Enterprises
140 Dog Branch Road
Brasstown, NC 28902

Call 1-704-837-9200 or for MC, Visa and COD orders only: 1-800-438-8155

Jack Albert

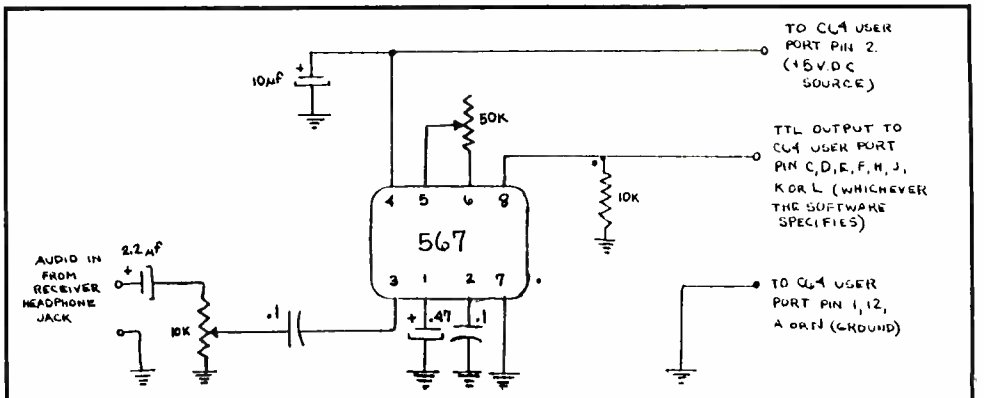
Contest Winner

Last February I proposed a challenge in hopes that the RTTY "pros" would respond. I referred to an article that appeared in 1965 March issue of *QST* that featured an RTTY decoder for beginners. The circuit used a single vacuum tube to decode one of the FSK tones. Could someone, I asked, construct a similar circuit -- one also easy enough for a beginner to tackle -- using modern IC technology.

The winner of the contest is Howard Lash of Lynwood, Illinois. He sent in a circuit using an NE567 tone decoder. The IC uses a Phase Lock Loop (PLL) to decode the tones and convert them to a "one/zero" signal. The output is then sent to the serial or user port of a computer. Appropriate software is then needed for your computer to decode the 0/1 signal.

The C64 has an internal communications I/O (Input/Output) IC which decodes the high/low output of the 567 chip. There are programs available for the C64. I know that's true because I have seen the listings in magazines. Unfortunately, I don't own a C64 so I'm unable to share any "public domain" software. The circuit shown below interfaces the Commodore 64.

I have been able to use my Tandy 1000 and a software package called RTTY.BAS. You can find it at a hamfest in your area. Usually public domain software dealers sell an IBM PC compatible program disk called "Ham Radio 1, 2, or 3." If you search through the dealer's index (usually they have them in a folder for your convenience) you will find programs listed as "Ham Radio RTTY." The disk usually costs three to four dollars (five dollars is too much).



"Bare Bones" RTTY Decoder

The capacitors and resistors are available from your junk box or new from Radio Shack. They did sell the LM567 several years ago and you may be able to special order it. Some Radio Shacks offer that service. The two dealers I listed below* stock the chip but they both have $20 minimum order requirements.

With the low cost software and parts, the project shouldn't cost more than $10. I don't think you can enter the RTTY hobby for less than that, especially if you already own the computer.

Nabbing the Big One

Last Easter, a company called TCOM, located in Columbia, Maryland, was conducting a test on 27 and 56 kHz. They were using a 3,000 foot tethered antenna that was extended by a helium/air filled balloon called an aerostat. They were running 50 kW. I copied them Sunday morning at 9 a.m. CST using 50/50 normal RTTY.

They gave their phone number and urged listeners to call and give signal reports. I immediately called the number and the person on the other end was very glad to get a signal report. We talked for a while and exchanged ham calls. I told him that I would give listen the next day using my mobile setup.

The next day I got to work early so I could set up my VLF station (less the RTTY equipment). My plan was to record the RTTY on my Sony micro cassette and play it back into the M7000 that night. I tuned in the signal at 56 kHz and the "S" meter read an S1 on the R71 using a Burhans VLF converter, an F.E.T. preamp and a three foot whip antenna.

I was in Rolling Meadows, Illinois, about two miles from WGN, a 50,000 watt AM station, and four miles from WBBM, also running 50,000 watts. I was surprised that I could even hear them.

I switched over to my ferrite rod antenna and their signal jumped to an S9. I recorded about two minutes of text and went to work. That night I received a call from Dave Wilson, who was also listening. He copied the text shown below at about 2:30 EST while I was at work. We are probably the first hobbyists to ever have their names broadcast on a VLF station below 30 kHz!

A similar test was conducted by Astron Corp. a few years ago but I was unable to hear the signal in the Chicago area. I didn't know about the test until Dave called me the day before. I guess it proves that if you listen on a daily basis, sooner or later you'll bag a big one. Thanks, Dave.

NNN

* Digi-Key, 701 Brooks Ave. South, P.O. Box 677, Thief River Falls, MN, 56701-0677, Phone 800-344-4539 -- LM567, cost 75 cents

Jamco Electronics, 1355 Shoreway Road, Belmont, CA 94002, Phone 415-592-2503 -- LM567, cost 75 cents

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Copied April 1, 1991
1945 utc
27 kHz
50bd/50Hz

-------------------------------------------------------------------


RYRYRYRYYRYRYRYRYRYRYRYRYRYRYYRYRYRYRYRYRYRYRYRYRYRYYRYYRYRYRY
                        KUDOS
                        -----
     NO PROGRAM HAS EVER COME TO FRUITION IF IT WERE NOT
FOR THE DEDICATION AND SACRIFICE OF PEOPLE. HERE ARE SOME
OF THE PEOPLE THIS PROGRAM WOULD LIKE TO RECOGNIZE. THIS
LIST IS BY NO MEANS COMPLETE SO IF WE FORGOT SOMEONE. WE
APOLOGIZE.
     HERE ARE THE NAMES OF THE PEOPLE WHO TOOK
TIME OUT TO CALL US WITH RECEPTION REPORTS:
  1. DAVE WILSON, A RADIO BUFF
        FROM FREDERICKSBURG, VA
  2. JACK ALBERT, A HAM RADIO OPERATOR WA9FVP
        FROM CHICAGO, IL
  3. JIM CONRAD, A HAM RADIO OPERATOR N4WFP
        FROM NORFOLK, VA
-------------------------------------------------------------------
This printout was sent in by Dave Wilson.  There arn't too many
RTTY Buffs that have the privilage of seeing their own name trans-
mitted on  VLF RTTY.
```

ALBANIA
Radio Tirana, 9760 kHz. Full data QSL without verification signer. Received in 40 days for an English report. Station address: Radiotelevisione Shqiptar, External Services, Rrugismail Qemali, Tirana, Albania. (Combs, CA) (Adams, NJ)

ANTARCTICA
NNNOICE-U.S. Navy Mars Station McMurdo, 13974 kHz USB. Full data prepared post card. Received in 60 days for an English utility report, and gift. Station address: U.S. Navy Communication Station COMNAVSUPPOR-ANTARCTICA McMurdo Station, FPO San Francisco, California 96601. (Combs,CA) *Nice QSL -- not reported often-ed.*

BURKINA FASO
Radiodiffusion Nat'l du Burkina 4815 kHz Partial data combination verification/schedule letter, without verification signer. Received in one year after a French follow-up report, and mint postage. Station address: Boite Postal 7029, Ouagadougou, Burkina Faso, Africa. (Landau, NJ)

CHINA
Radio Beijing, 11715 kHz. Full data QSL card, without verification signer. Station address: Beijing 100866, People's Republic of China. (Mayberry, TX)

COLOMBIA
Radio Santa Fe, 4965 kHz. Full data prepared form card, with illegible signature. Also received a station sticker, and a certificado se sintoia card. Received in 32 days for a Spanish report, one IRC, and one U.S. dollar. Station address: Apartado Aero 9339, Bogota DE, Colombia. (Landau, NJ)

FINLAND
Radio Finland, 15185 kHz. Form letter explaining non-QSL policy. Received a station info sheet and program schedule. Received in 36 days for an English report. Station address: Box 10, SF-00241, Helsinki, Finland. (Mayberry, TX)

FRENCH POLYNESIA
RFO Tahiti, 15170 kHz. Full data QSL, without verification signer. Received in 15 days for an English report, and return postage. Station address: Boite Postal 125, Papeete, Tahiti, French Polynesia. (Combs, CA)

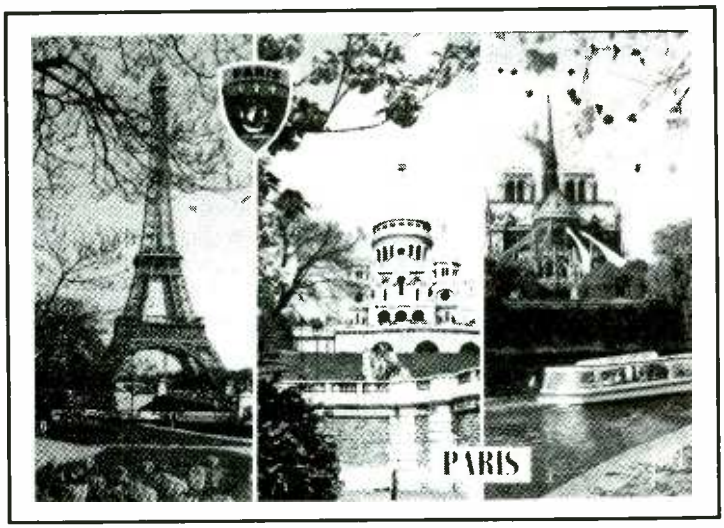
GABON:
Radio France Int'l, 12015 kHz. Full data QSL card, without verification signer. Received in 55 days for an English report. Station address: Boite Postal 9516, Paris, France. (Combs, CA)

GERMANY
Bayerischer Rundfunk, 6085 kHz. Full data card, without verification signer. Also received a 250 page program schedule book. Received in 30 days for an English report. Station address: Rundfunkplatz 1, 8000 Muchen, Republic of Germany (Orcutt, NY)

JAMAICA
Jamaica Broadcasting Corp. Radio One 700 kHz AM. Full data friendly letter on station letterhead, verified by Hector Wheeler, program director. Received for an English AM report and four U.S. mint stamps. Station address: 5 South Odeon Avenue, P.O. Box 100, Kingston 10, Jamaica, West Indies. (Nelson, SD)

JAPAN
Radio Japan, 5960 kHz. Nondata stamped QSL scenery card, without verification signer Received in 40 days for an English report. Station address: Tokyo 150-01, Japan. (Adams, NJ) (Mayberry, TX)

Radio France Int'l highlights Paris on this QSL sent by John Flake of Charlotte , NC.



SHIP TRAFFIC
Edgar B. Speer-WQZ9670, 4075 kHz (bulk carrier). Full data prepared form card, verified and stamped with ship's seal by Francis N. Altman, captain. Received in 14 days for an English utility report and a self-addressed stamped envelope. Ship address: c/o Marine Post Office, Detroit, MI 48222 (Hill, MI)

Contship Europe-DIEB, 500 kHz (container vessel). Full data letter, with picture of ship. Received in 38 days for an English utility report and one U.S. dollar. Ship address: Jonny Wesch, Gehrden 15, D-2155 Jork, Republic of Germany. (Holbrook, MD) *This ship was changed from the previous Bold Eagle.-ed.*

Federal Danube-P30Z2, 500 kHz (bulk carrier). Full data prepared card. Received in 32 days for an English utility report and one dollar and Canadian mint stamps. Ship address: FEDNAV, Ltd., National Bank Tower-Suite 2600, 600 de la Gauchetiere West, Montreal, Quebec H3B 4M3 Canada. (Holbrook, MD)

Solar Wing-ELJS5, 15665 kHz (car carrier). Full data prepared card. Received in seven days for an English utility report and one U.S. dollar. Ship address: ACT Maritime Co. Ltd., Honda Yaesu Bldg-5-5 Yaesu, Chuo-Ku, Tokyo 103, Japan. (Holbrook, MD)

World Wing-ELJS5, 15665 kHz (pure car carrier). Full data prepared card. Received in 286 days for an English utility report and one U.S. dollar. Ship address: ACE Shipping Co. Ltd. Kowa Bldg. 3rd Floor, 4-5 Chome, Hacchobori, Chuo-ku, Tokyo 104, Japan. (Holbrook, MD)

SOUTH AFRICA
Radio RSA, 15365 kHz. Full data scenery card of Durban Beachfront, without verification signer. Received in 63 days for an English report and two IRCs. Station address: P.O. Box 4559, Johannesburg 2000, Republic of South Africa. (Carson, OK)

SWAZILAND
Trans World Radio. Full data QSL folder card, verified by Carol Tatlow. Also received stickers and program schedules. Received in 111 days for an English report and four IRCs. Station address: P.O. Box 64, Manzini, Swaziland, Africa. (Carson, OK)

SWEDEN
Radio Sweden, 11705 kHz. Full data QSL card, with illegible signature. Also received stickers and schedules. Received in 16 days for an English report. Station address: S-105 10 Stockholm, Sweden. (H.S., CA) (Adams, NJ)

TAIWAN-Republic of China
Voice of Free China, 11805 kHz. Full data QSL card, without verification signer. Also included schedules and station information letter. Received in 29 days for an English report. Station address: P.O. Box 24038, Taipei, Taiwan, Republic of China. (Mayberry, TX) (Adams, NJ)

THAILAND
Voice of the Khmer, 6325 kHz. Partial data date frequency card, without verification signer. Station schedule also included. Received in 44 days after one follow-up report, mint stamps, and one additional Baht stamp. Station address: VOK, c/o P.O. Box 22025, Ramindra Post Office, Bangkok, 10 220, Thailand. (Hardester, NC)

TURKEY
Turkish State Meterological Service, 6900 kHz. Full data form letter verified by Faysal Geyik, general director. Also received a program schedule and tourist brochure. Received in 45 days for an English report and Turkish mint postage. Station address: P.O. Box 401, Ankara, Turkey. (Oscutt, NY)

UNITED STATES
Houston Aeradio, KEP5-13330 kHz Partial data prepared card, with illegible signature. Received in six days for an English report Station address: 8222 Travelir, Houston, TX 77061. (Hill, MI)

Honolulu Volmet, KVM 70-13282 kHz. Full data letter, verified by Francis G. Judd, airtraffic manager. Received in 11 days for an English report. Station address: 4204 Diamond Head Road, Honolulu, Hawaii 96816. (Hill, MI) (Datko, CA)

WNSL388, Washington Co., Full data prepared card returned verified by E. William Ensor Jr. Received for an English report, for a log I managed while traveling through Maryland. Station address: c/o veri signer, Deputy Chief Engineer, Office of Maintenance, Maryland Dept. of Transportation, State Highway Administration, 707 North Calvert St., Baltimore, MD 21203-0717. (Hardester, NC)

how to use the shortwave guide

The new shortwave guide of *Monitoring Times* is a professional level tool designed to help you hear more stations. You'll find three main elements: frequencies, propagation charts, and programming. The frequencies will tell you where to tune; the propagation charts will help you to use your listening time more effectively be predicting the likelihood of hearing a station from a particular part of the world; and the programming section will give you some idea of what to expect when you tune the station in.

The frequency section now includes virtually every English language transmission in the world including those directed to other parts of the world as well as North America. Do not be disappointed if you do not hear some of these on your first time out. Their level of difficulty ranges from "middling" to, literally, "once-in-a-lifetime." If such challenges frustrate you, stick to the frequencies directed solely to your target area.

The first four digits of a listing are the start time in UTC or "Universal Time Coordinated." Because this so-called "world time" can be confusing, we have provided corresponding local time for the Eastern ("EST") and Pacific ("PST") time zones.

The space between the transmission end and the name of the station is the broadcast schedule. If there is no entry here (as is most often the case), the transmission is made every day. In other cases, the following letters represent the days of the week the transmission can be heard:

S(Sunday)
M(Monday)
T(Tuesday)
W(Wednesday)
H(Thursday)
F(Friday)
A(Saturday)

Other schedule codes are **"ten"** which means that the schedule is tentative, **"tes"** which means that it is a test transmission and **"war"** which means that the station's schedule has been disrupted by armed conflict.

The next listing is the station's name and location. Occasionally, you will find one of the following codes after the station name:

[1] the transmission is multi-lingual, containing both English and another language(s)
[2] the broadcast contains nothing but music
[3] the English broadcast is transmitted irregularly
[4] the transmission is an English language lesson

Frequencies are listed in ascending order, from lowest to highest. We suggest that you begin with the lowest frequency and work your way up to the highest frequency. Of course, keep in mind that the lower frequencies generally work better at night; the higher ones during the day. Not all frequencies will be audible at any given time.

Shortwave, or "world band" transmissions are often targeted to specific areas of the world. Following each frequency is a code indicating the area of the globe to which the frequency is "officially" directed. While such a scheme often gives listeners a fair idea of the likelihood of receiving a particular broadcast, remember that in shortwave, there are no hard and fast rules. Voice of America shows sent to Africa in our late evening, for example, are easily heard in North America. Do not hesitate to try and hear any transmission listed in this section.

For easy-going, look for frequencies directed to:
na (North America)
ca (Central America or Caribbean)
am (Americas)

Other codes include:
af (Africa)
as (Asia)
au (Australia)
eu (Europe)
me (Middle East)
pa (Pacific)
sa (South America)

If a transmission is directed to North America and some other area, we list it as North America-bound. If it is directed to a number of different (non-American) targets, we list it as **"va"** (various). Transmissions marked **"do"** are for domestic or local consumption. Again, it is possible that you can hear these. Finally, you will occasionally see a transmission listed as **"om"** (omnidirectional sent out in all directions simultaneously), or **"??"** (we don't know where it is supposed to be going).

Remember, this is a list of all English language transmissions to the world. It includes not only the powerhouse, easy-to-hear stations from the United States, Canada, Germany and the Soviet Union, but tiny local broadcasters like the 40 watt Tristan Radio, located on a tiny island located in the middle of the South Atlantic. Your chances of hearing such a station are, quite frankly, near nil.

Desiring, however, to provide you with every possible tool so that you can effectively search out such rare fare, we also include propagation charts with this section. These are found at the conclusion of the frequency/program list and are designed to give you an idea of the best time to try for a particular station or region. Instructions for using the propagation charts are found at the beginning of that section.

A list of suggested programs can be found under the frequencies for most hours. They are listed in order of their start time in UTC. This list of programs changes every month in order to give you a wide familiarity with what shortwave's over 1,100 frequencies can bring you.

Please note that some program listings may be followed by "See X 0000. The letter stands for a day of the week (see day code legend for the frequency section). The four digits stand for a time in UTC. Listeners should check back to that date and time to find out more about that particular program.

Remember that, unlike many other publications, *Monitoring Times* makes changes to this list up to two weeks before press time and is thus able to keep this list among the most accurate in the world. Errors will naturally occur and we ask your assistance in correcting them.

You may address your corrections, additions and suggestions to Frequency Manager (or Program Manager if program details), P.O. Box 98, Brasstown, NC 28902. You may also fax changes to us at 1-704-837-2216 24 hours a day.

MT Monitoring Team

Greg Jordan, Frequency Manager
P.O. Box 98
Brasstown, NC 28902

Kannon Shanmugam
Program Manager
P.O. Box 98
Brasstown, NC 28902

John Carson
Oklahoma

Jim Frimmel
Texas

CREDITS: Special thanks go to Radio Canada Int'l, the Voice of Turkey, Radio Finland, the Christian Science Monitor, and the VOA, as well as to Dave Datko, Lloyd Privette, Tammy Wells, Robert E. Montgomery, Jack Hubby, Jack Nibecker, Michael Mayer, Jeffrey Cohen, John Babbis, Norman Blakely, Joe Freeborn, David Pease, Robert Merrill, Christopher Hughes, John "Load the Boat to Peoria, IL" Fawcett, Kim Andrew Elliott, C. Clifford Coffman (that last minute WYFR sked really helped), Don Keen, Robert Thomas, B.W. Battin, Austin Wattles, Herbert Foster, Joe O'Brien, Ken MacHarg, Nathaniel Finestone, Herb Haines, Lee Boulineau, Alan Rosen, Martin Gallas, Bill Freeland, Robert Scott, Dwight Rideout, David Beard, Timothy Coucke(KNLS), Ricardo Molinar, Robert Pettengill, Kenneth Loh, Jerry Lucas, Richard Cinert, Chuck Roswell, Ray Bakus, Bob Roeder, and Rick Sher. Thanks for your continuing support in keeping the frequency section up to date.

newsline

"Newsline" is your guide to news broadcasts on the air. ■ All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. ■ All broadcasts are daily unless otherwise noted by the day codes.

0000 UTC
(8:00 PM EDT, 5:00 PM PDT)

BBC
CBC, Northern Quebec
Christian Science Monitor
Kol Israel
Radio Australia
Radio Beijing
Radio Canada Int'l [S-M]
Radio Havana Cuba [T-S]
Radio Korea
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Prague Int'l
Radio Thailand
Radio Yugoslavia
Spanish Foreign Radio
Voice of America
WWCR (USA Radio News) [T-S]
0005
Radio Pyongyang
0010
Radio Beijing*
0030
Christian Science Monitor (Asia) [M]
Christian Science Monitor [T-F]
HCJB*
Radio Budapest
Radio Havana Cuba [T-S]
Radio Netherlands [T-S]
Voice of America (Americas, East Asia) (Special English) [T-S]
Voice of America (East Asia) (Special English) [M]
0045
Radio Korea (News Service)
0055
WRNO (ABC News) [W, A]

0100 UTC
(9:00 PM EDT, 6:00 PM PDT)

All India Radio
BBC
CBC, Northern Quebec [S-M]
Christian Science Monitor
Deutsche Welle
Kol Israel
Radio Australia
Radio Belize
Radio Canada Int'l [S-M]
Radio Havana Cuba [T-S]
Radio Japan
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Thailand
Radiotelevisione Italiana
Spanish Foreign Radio
Voice of America
Voice of Indonesia
WWCR (USA Radio News) [T-A]
0115
Radio Havana Cuba* [T-S]
0120
Radio for Peace Int'l [T-A]
0125
HCJB
0130
Christian Science Monitor (Asia) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Portugal [T-A]
Voice of Greece [M-A]
0155
Voice of Indonesia

0200 UTC
(10:00 PM EDT, 7:00 PM PDT)

BBC
CBC, Northern Quebec [T-S]
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Canada Int'l [T-A]
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Prague Int'l
Radio Romania Int'l
Radio Thailand
RAE, Buenos Aires [T-A]
Swiss Radio Int'l
Voice of America
Voice of Free China
Voice of Myanmar
WWCR (USA Radio News) [T-S]
0215
Radio Cairo
0230
Christian Science Monitor (Africa, Europe) [M]
Christian Science Monitor [T-F]
HCJB*
Radio Havana Cuba [T-S]
Radio Pakistan (Special English)
Radio Tirana, Albania
0245
Radio Korea (News Service)
0250
Radio for Peace Int'l [T-A]
Radio Yerevan

0300 UTC
(11:00 PM EDT, 8:00 PM PDT)

BBC
CBC, Northern Quebec
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Beijing
Radio Belize
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Prague Int'l
Radio Sofia
Radio Thailand
Voice of America
Voice of Free China
Voice of Turkey
WRNO (ABC News) [F]
WWCR (USA Radio News) [M-A]
0305
Radio New Zealand Int'l* [M-F]
0309
BBC*
0310
Radio Beijing*
0315
Radio Cairo
Radio Havana Cuba* [T-S]
0325
HCJB
0330
BBC (Africa)*
Christian Science Monitor (Africa, Europe) [M]
Christian Science Monitor [T-F]
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Netherlands [T-S]
Radio Tirana, Albania
UAE Radio, Dubai
0340
Voice of Greece [M-A]
0350
Radiotelevisione Italiana
0355
Radio Japan [M-F]
WYFR (Network) [T-A]

0400 UTC
(12:00 AM EDT, 9:00 PM PDT)

BBC
CBC, Northern Quebec [T-S]
Christian Science Monitor
Deutsche Welle
Kol Israel
Radio Australia
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Romania Int'l
Radio RSA
Radio Tanzania
Radio Thailand
Swiss Radio Int'l
Voice of America
WWCR (USA Radio News) [T-A]
0405
Radio Pyongyang
0410
Radio Beijing*
0425
Radiotelevisione Italiana
0430
Christian Science Monitor (Africa, Europe, NE Asia) [M]
Christian Science Monitor [T-F]
Radio Botswana
Radio Canada Int'l [M-F]
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Tirana, Albania
0450
Radio RSA

0500 UTC
(1:00 AM EDT, 10:00 PM PDT)

BBC
CBC, Northern Quebec
Christian Science Monitor
Deutsche Welle
HCJB*
Radio Australia
Radio Beijing
Radio Havana Cuba [T-S]
Radio Japan
Radio Lesotho
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Thailand
Spanish Foreign Radio
Voice of America
0505
Radio New Zealand Int'l* [M-F]
0510
Radio Beijing*

English language **shortwave guide**

newsline

Radio Botswana
0515
Radio Canada Int'l [M-F]
Radio Havana Cuba* [T-S]
0530
BBC (Africa)*
Christian Science Monitor (Africa, Europe, NE Asia) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Romania Int'l
Radio Thailand
UAE Radio, Dubai
Voice of Nigeria
0540
Radio Prague Int'l
0545
Voice of Nigeria*
0550
Radio for Peace Int'l [T-A]
0555
HCJB

0600 UTC
(2:00 AM EDT, 11:00 PM PDT)

BBC
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-F]
Voice of America
0605
Radio Pyongyang
0610
Voice of Malaysia
0630
BBC (Africa)*
BRT, Brussels [M-F]
Christian Science Monitor [M-F]
Radio Finland [T-A]
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Polonia
Radio Prague Int'l
Radio Sofia
Radio Tirana, Albania
RTV Congolaise, Brazzaville [M-F]
Swiss Radio Int'l
0645
Radio Romania Int'l

0700 UTC
(3:00 AM EDT, 12:00 AM PDT)

BBC
Christian Science Monitor
Radio Australia
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow (World Service)
Radio Tirana, Albania
Voice of Free China
Voice of Myanmar
0715
Radio Havana Cuba* [T-S]
0720
Radio for Peace Int'l [T-A]
0730
BBC (Africa)* [M-A]
Christian Science Monitor [M-F]
HCJB*
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Netherlands [M-A]
0755
Radio Japan [M-F]

0800 UTC
(4:00 AM EDT, 1:00 AM PDT)

BBC
Christian Science Monitor
Radio Australia
Radio Finland [T-A]
Radio Korea
Radio Moscow (World Service)
Voice of Indonesia
0805
Radio Pyongyang
0810
Voice of Malaysia
0825
HCJB
0830
Christian Science Monitor [M-F]
Radio Beijing
Radio Finland [T-A]
Radio Moscow (World Service)
Radio Netherlands [M-A]
Swiss Radio Int'l
0840
Radio Beijing*
Voice of Greece [M-A]
0855
Voice of Indonesia

0900 UTC
(5:00 AM EDT, 2:00 AM PDT)

BBC
BRT, Brussels [M-F]
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Japan
Radio Moscow (World Service)
0915
Radio Korea (News Service)
0930
Christian Science Monitor [M-F]
Deutsche Welle (Africa)* [M-F]
Radio Beijing
Radio Moscow (World Service)
0940
Radio Beijing*
0955
Radio Japan [M-F]

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)

All India Radio
BBC
Christian Science Monitor
HCJB*
Kol Israel
Radio Australia
Radio Moscow (World Service)
Radio Tanzania
Swiss Radio Int'l
Voice of America
1030
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Moscow (World Service)
Radio Netherlands [M-A]
UAE Radio, Dubai
1040
Voice of Greece [M-A]
1050
Radio Finland [T-F]
1055
All India Radio
HCJB

1100 UTC
(7:00 AM EDT, 4:00 AM PDT)

BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Beijing
Radio Japan
Radio Jordan
Radio Korea
Radio Moscow (World Service)
Radio RSA
Swiss Radio Int'l
Trans World Radio, Bonaire [M-F]
Voice of America
1105
Radio Pakistan (Special English)
Radio Pyongyang
1109
BBC*
1110
Radio Beijing*
Radio Belize [T-A]
Radio Botswana [M-F]
1115
Radio Korea (News Service)
1125
Radio Belize [M]
Radio Botswana [A-S]
1130
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Austria Int'l [M-F]
Radio Korea [M-S]
Radio Lesotho
Radio Moscow (World Service)
Radio Netherlands [M-A]
1135
Radio Thailand
1150
Radio RSA
1155
Radio Japan [M-F]

1200 UTC
(8:00 AM EDT, 5:00 AM PDT)

BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Bras, Brasilia [M-A]
Radio Canada Int'l [M-F]
Radio Finland [T-F]
Radio Moscow (World Service)
Radio Polonia
Radio Romania Int'l
Radio Tashkent
Radio Thailand
Radio Yugoslavia
Swiss Radio Int'l
Voice of America
WWCR (USA Radio News) [S-F]
1210
Radio Beijing*
1215
Radio Korea
1230
Christian Science Monitor [M-F]
Radio Cairo
Radio France Int'l
Radio Moscow (World Service)
Trans World Radio, Bonaire [M-A]
Voice of Turkey
1235
Voice of Greece
1255
WYFR (Network) [M-F]

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)

BBC ("Newshour")
BRT, Brussels [M-F]
CBC, Northern Quebec
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Belize
Radio Canada Int'l (North America) [S]
Radio Finland [T-A]
Radio Jordan
Radio Moscow (World Service)
Radio Peace and Progress
Radio Romania Int'l
Radio Tanzania [A-S]
Radio Tirana, Albania
Trans World Radio, Bonaire [S]
Voice of America
WWCR (USA Radio News) [M-F]
1305
Radio Pyongyang
1310
Radio Beijing*
1325
HCJB [M-F]
1328
Radio Cairo
1330
All India Radio
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Canada Int'l
Radio Korea (News Service)
Radio Moscow (World Service)
Radio Tashkent
Swiss Radio Int'l
UAE Radio, Dubai
Voice of America (Special English)
1346
All India Radio (UN News) [A]

1400 UTC
(10:00 AM EDT, 7:00 AM PDT)

BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Finland [T-A]
Radio France Int'l
Radio Japan
Radio Korea
Radio Moscow (World Service)
Voice of America
WWCR (USA Radio News)
1405
Radio Pyongyang
1410
Radio Beijing*
1425
HCJB [M-F]
Radio Finland
1430
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Moscow (World Service)
Radio Netherlands [M-A]
Radio Polonia
1445
BBC (East Asia) (Special English) [M-F]
Voice of Myanmar
1455
All India Radio

1500 UTC
(11:00 AM EDT, 8:00 AM PDT)

BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Beijing
Radio Belize [M-A]
Radio Canada Int'l
Radio Japan
Radio Jordan
Radio Moscow (World Service)
Radio Portugal [M-F]
Radio Romania Int'l

newsline

Radio RSA
Voice of America
WWCR (USA Radio News) [M-F]
1505
Radio Pyongyang
1510
Radio Beijing*
1530
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
FEBA, Seychelles
Radio Moscow (World Service)
Radio Tirana, Albania
Swiss Radio Int'l
Voice of Greece [M-A]
1545
Radio Korea (News Service)

1600 UTC
(12:00 PM EDT, 9:00 AM PDT)

BBC
CBC, Northern Quebec [A]
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Beijing
Radio Canada Int'l
Radio France Int'l
Radio Jordan
Radio Korea
Radio Lesotho
Radio Moscow (World Service)
Radio New Zealand Int'l [M-F]
Radio Polonia
Radio RSA
Radio Tanzania
Voice of America
1605
Radio New Zealand Int'l* [M-F]
1609
BBC*
1610
Radio Beijing*
Radio Botswana [M-F]
1630
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Moscow (World Service)
Radio Netherlands [M-A]
Radio Peace and Progress
Radio Polonia
UAE Radio, Dubai
Voice of America (except Africa) (Special English)
WYFR (Network) [A]
1635
WYFR (Network) [M-F]

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)

BBC
CBC, Northern Quebec [A]
Christian Science Monitor
Kol Israel
Radio Australia
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Moscow (World Service)
Radio New Zealand Int'l [S-F]
Radio Prague Int'l
Radio RSA
Voice of America
WWCR (USA Radio News) [A]
1705
Radio Pyongyang
1709
BBC (Africa)* [A-S]
1710
Radio Beijing*
1715
Radio Korea (News Service)
1725
WYFR (Network) [A]
1730
BRT, Brussels [M-F]
Christian Science Monitor [M-F]
Radio Moscow (World Service)
Radio Romania Int'l
Swiss Radio Int'l
1740
BBC (Africa)* [M-F]
1750
Radio RSA

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)

All India Radio
BBC
CBC, Northern Quebec [M-F]
Christian Science Monitor
KVOH (UPI News)
Radio Australia
Radio Belize [M-F]
Radio Bras, Brasilia [M-A]
Radio Canada Int'l
Radio Korea
Radio Moscow (World Service)
Radio New Zealand Int'l [S-F]
Radio Tanzania
Voice of America
WWCR (USA Radio News) [M-F]
1803
Radio Jamahiriya, Libya
1830
Christian Science Monitor [M-F]
Radio Belize
Radio Budapest
Radio Finland [M-F]
Radio Moscow (World Service)
Radio Netherlands [M-A]
Radio Polonia
Radio Prague Int'l
Radio Sofia
Radio Tirana, Albania
Radio Yugoslavia
Swiss Radio Int'l
Voice of America (Special English)
1840
SLBC, Sri Lanka
Voice of Greece
1847
Radio Jamahiriya, Libya
1855
BBC (Africa)* [M-F]
Radio Finland
WYFR (Network) [M-A]

1900 UTC
(3:00 PM EDT, 12:00 PM PDT)

All India Radio
BBC
Christian Science Monitor [M-A]
Deutsche Welle
HCJB*
Kol Israel
KVOH (UPI News)
Radio Australia
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Japan
Radio Moscow (World Service)
Radio New Zealand Int'l [S-F]
Radio Tanzania
RAE, Buenos Aires [M-F]
Spanish Foreign Radio
Swiss Radio Int'l
Voice of America
1905
Radio New Zealand Int'l* [S-H]
1910
Radio Beijing*
Radio Botswana
1920
Voice of Greece
1930
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Austria Int'l
Radio Havana Cuba [M-A]
Radio Moscow (World Service)
Radio Romania Int'l
1935
Radiotelevisione Italiana
1945
Radio Korea (News Service)
1955
HCJB

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)

BBC
CBC, Northern Quebec [S-F]
Christian Science Monitor
KVOH (UPI News)
Radio Australia
Radio Beijing
Radio Belize [M-F]
Radio Havana Cuba [M-A]
Radio Kiev
Radio Moscow (World Service)
Radio New Zealand Int'l [S-F]
Radio Polonia
Radio Portugal [M-F]
Radio Prague Int'l
Voice of America
Voice of Indonesia
Voice of Turkey
2005
Radio Pyongyang
2010
Radio Beijing*
2025
Radio Havana Cuba* [M-A]
Radiotelevisione Italiana
WYFR (Network) [M-F]
2030
Christian Science Monitor [M-F]
Radio Budapest
Radio Havana Cuba [M-A]
Radio Korea
Radio Moscow (World Service)
Radio Netherlands [M-A]
Radio Sofia
WYFR (Network) [A]
2045
Radio Korea (News Service)
2050
Radio for Peace Int'l [M-F]
2055
Voice of Indonesia

2100 UTC
(5:00 PM EDT, 2:00 PM PDT)

All India Radio
BBC ("Newshour")
BRT, Brussels [M-F]
CBC, Northern Quebec [S-F]
Christian Science Monitor [M-A]
Deutsche Welle
KVOH (UPI News)
Radio Australia
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Finland [M-F]
Radio Japan
Radio Moscow (World Service)
Radio New Zealand Int'l [S-F]
Radio Peace and Progress
Radio Portugal [M-F]
Radio Prague Int'l
Radio Romania Int'l
Radio Yugoslavia
Spanish Foreign Radio
Swiss Radio Int'l
Voice of America
2110
Radio Beijing*
2130
Christian Science Monitor [M-F]
Kol Israel
Radio Cairo
Radio Canada Int'l [A-S]
Radio Moscow (World Service)
Radio Sofia
Radio Vilnius
Swiss Radio Int'l
WYFR (Network) [M-F]
2155
WYFR (Network) [M-A]

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)

All India Radio
BBC
CBC, Northern Quebec [M-F]
Christian Science Monitor
Radio Australia
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Vilnius
Radiotelevisione Italiana
Voice of America
Voice of Free China
Voice of Turkey
2208
Voice of America (Caribbean)* [M-F]
2210
Radio Beijing*
2220
Radio for Peace Int'l [M-F]
2225
Radio Havana Cuba* [M-A]
2230
Christian Science Monitor [M-F]
Radio Havana Cuba [M-A]
Radio New Zealand Int'l [S-H]
Radio Polonia
Radio Tirana, Albania
Voice of America (Special English)
2233
Radio Jamahiriya, Libya
2245
Voice of Greece

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)

BBC
CBC, Northern Quebec [A]
Christian Science Monitor [M-A]
Kol Israel
Radio Australia
Radio Belize [M-F]
Radio Canada Int'l
Radio Finland [M-F]
Radio Japan
Radio Kiev
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Prague Int'l
Radio Sofia
Voice of America
WWCR (USA Radio News) [M-F]
2305
Radio Polonia
Radio Pyongyang
2315
All India Radio
2320
Radio Thailand
2330
BRT, Brussels [M-F]
Christian Science Monitor [M-F]
Radio Budapest [M-A]
Radio Jamahiriya, Libya
Radio Tirana, Albania
2355
Radio Japan [M-F]
WRNO (ABC News) [W, F]

English language

shortwave guide

0000 UTC [8:00 PM EDT/5:00 PM PDT]

FREQUENCIES

0000-0015		Voice of the People of Cambodia, Phnom-Penh	9695$_{as}$	11938$_{as}$	
0000-0030		Radio Canada Int'l, Montreal	11905am	15235am	
0000-0030	sm	Radio Canada Int'l, Montreal	5960na	9755na	13760na
0000-0030		Kol Israel, Jerusalem	9435na	11605na	15640na
0000-0030		Radio Australia, Melbourne	13605$_{va}$	15160$_{va}$	15240$_{va}$
			15320$_{va}$	17715$_{va}$	17630$_{va}$
			17750$_{va}$	17795$_{va}$	
0000-0030	stwhfa	Radio Prague, Czechoslovakia	7345$_{na}$	9540$_{na}$	11990$_{na}$
0000-0030		BBC London, England	5965$_{va}$	5975$_{va}$	6005$_{va}$
			6175$_{va}$	6195$_{va}$	7145$_{va}$
			7325$_{va}$	9580$_{va}$	9590$_{va}$
			9670$_{va}$	9915$_{va}$	11750$_{va}$
			11945$_{va}$	11955$_{va}$	12095$_{va}$
			15070$_{va}$	15260$_{va}$	15360$_{va}$
			17830$_{va}$		
0000-0050		Radio Yugoslavia, Belgrade	9620na	11735na	
0000-0100		All India Radio, Delhi	9535$_{as}$	9910$_{as}$	11715$_{as}$
			11745$_{as}$	15110$_{as}$	
0000-0100		ABC Brisbane, Australia	4920$_{do}$	9660$_{do}$	
0000-0100		ABC Perth, Australia	9610$_{do}$		
0000-0100	sm	Radio Canada Int'l, Montreal	5960na	9755na	
0000-0100		CFRB, Montreal	6070$_{do}$		
0000-0100		CBN, Canada	6160$_{do}$		
0000-0100		FEBC Radio Int'l, Philippines	15490$_{as}$		
0000-0100		Radio Beijing, China	9770$_{am}$	11655am	11715$_{am}$
			17705$_{am}$		
0000-0100		Christian Science World Service	7395$_{na}$	9850$_{na}$	13760$_{na}$
			17555na	17865va	
0000-0100		Radio Havana Cuba	11820$_{am}$		
0000-0100		Radio Moscow World Service	7370$_{va}$	17655$_{va}$	17890$_{va}$
0000-0100		Radio Moscow N. American Svc.	9530$_{na}$	9685$_{na}$	9720$_{na}$
			11735$_{na}$	11850$_{na}$	11860$_{na}$
			11950$_{na}$	12050$_{na}$	15425$_{na}$
			17605$_{na}$	17665$_{na}$	17700$_{na}$
			21480$_{na}$		
0000-0100		Radio Korea, Seoul, S. Korea	15575$_{na}$		
0000-0100		Radio Luxembourg	6090$_{om}$	15350$_{om}$	
0000-0100	smtwhf	Radio New Zealand Int'l	17770$_{pa}$		
0000-0100		Radio Pyongyang, North Korea	11335$_{na}$	13775$_{na}$	15115$_{na}$
0000-0100		RTV Malaysia, Radio 4	7295$_{do}$		
0000-0100		SBC Radio 1, Singapore	5010$_{do}$	5052$_{do}$	11940$_{do}$
0000-0100		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0000-0100		Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
0000-0100		Spanish Foreign Radio, Madrid	9630$_{na}$	11880$_{na}$	
0000-0100		Voice of America, Washington	7120$_{as}$	9770$_{as}$	11760as
			15185$_{as}$	15290as	17735as
			17820as		
0000-0100		Radio Kiev, Ukraine	11790na	13645na	15180na
			15455na	15485na	
0000-0100		KTBN Salt Lake City, Utah	15590$_{am}$		
0000-0100		Radio for Peace Int'l, Costa Rica	7375	13630	21566
0000-0100		WRNO New Orleans, Louisiana	7355$_{am}$		
0000-0100		WHRI Noblesville, Indiana	7315$_{am}$	9495$_{am}$	
0000-0100		WINB Red Lion, Pennsylvania	15145$_{eu}$		
0000-0100		WYFR, Okeechobee, Florida	5985$_{am}$		
0000-0100		WWCR Nashville, Tennessee	15690$_{am}$		
0000-0100		Voice of America, Washington	5995$_{ca}$	6130$_{ca}$	9455$_{ca}$
			9775$_{ca}$	9815$_{ca}$	11580$_{ca}$
			11695$_{ca}$	15205ca	
0015-0030	m	Radio Prague, Czechoslovakia	7345$_{na}$	9540$_{na}$	11990$_{na}$
0030-0100		BBC London, England	5975$_{va}$	6005$_{va}$	6175$_{va}$
			7325$_{va}$	9580$_{va}$	9670$_{va}$
			9915$_{va}$	11750$_{va}$	11945$_{va}$
			11955$_{va}$	12095$_{va}$	15070$_{va}$
			15260$_{va}$	15360$_{va}$	
0030-0100		HCJB Quito, Ecuador	9745$_{am}$	15155$_{am}$	21455$_{am}$
			25950$_{am}$		
0030-0100		Radio Australia, Melbourne	11880$_{va}$	13605$_{va}$	15240$_{va}$
			15465$_{va}$	17630$_{va}$	17750$_{va}$
			17795$_{va}$	17855$_{va}$	21740$_{va}$
0030-0100		Hunan PBS, Changs ha, China[4]	4990$_{do}$		
0030-0100		Radio Netherlands, Hilversum	6020$_{am}$	6165$_{am}$	15560$_{am}$
0030-0100		Radio Budapest, Hungary	6110na	9520na	9585na
			9835na	11910na	15160na
0030-0100		Sri Lanka B'casting Corp.	6005$_{as}$	9720$_{as}$	15425$_{as}$
0050-0100		Vatican Radio, Vatican City	6150$_{na}$	9605$_{na}$	

PROGRAMS

Sundays

0010 Kol Israel: Spotlight. People and issues in the news.
0015 Radio Beijing: Press Clippings. A review of the Chinese press.
0020 Radio Beijing: Travel Talk. An armchair tour of scenic spots in Chinese provinces.
0028 Radio Beijing: Cooking Show. The Beijing Frugal Gourmet.
0030 BBC: The Ken Bruce Show. Ken Bruce plays pop music, past and present.
0035 Radio Beijing: Music from China. Chinese music, from traditional to pop.
0037 Radio Netherlands: Newsline. News analysis from correspondents worldwide.
0052 Radio Netherlands: Rembrandt Express. Barry O'Dwyer presents a magazine program.

Mondays

0010 Kol Israel: The Week In Review. A look back at the week just past, as reported in the Israeli press.
0015 Radio Beijing: China Anthology. See S 1115.
0025 Radio Beijing: Music Album. See S 1125.
0030 BBC: In Praise Of God. Christian religious services and meditations.
0030 Radio Netherlands: Happy Station. See S 1130.
0040 Radio Beijing: Listeners' Letterbox. See S 1140.

Tuesdays

0010 Kol Israel: Calling All Listeners. See S 2310.
0015 Radio Beijing: Current Affairs. See M 1115.
0030 BBC: Panel Game. A radio game show; details not available at press time.
0037 Radio Netherlands: Newsline. See S 0037.

The BBC's Fred (Frederique Patterson) from A Jolly Good Show and Abla Khammash from the Arabic Service.

0040 Radio Beijing: Learn to Speak Chinese. See M 1140.
0052 Radio Netherlands: The Research File. See M 1152.

Wednesdays

0010 Kol Israel: Israel Sound. The latest tunes in pop and rock music from Israel.
0015 Radio Beijing: Current Affairs. See M 1115.
0030 BBC: Omnibus. Topical features on almost any topic, from Dracula to drugs.
0037 Radio Netherlands: Newsline. See S 0037.
0040 Radio Beijing: Listeners' Letterbox. See S 1140.
0052 Radio Netherlands: Images. See T 1152.

Thursdays

0010 Kol Israel: Israel Sound. The latest tunes in pop and rock music from Israel.
0015 Radio Beijing: Current Affairs. See M 1115.
0030 BBC: Comedy Show (except July 4th: "Two Cheers For June"). See W 1530.
0037 Radio Netherlands: Newsline. See S 0037.
0040 Radio Beijing: Learn to Speak Chinese. See M 1140.
0052 Radio Netherlands: Feature. See W 1152.

Fridays

0010 Kol Israel: Studio Three. A look at the arts, music, and culture in Israel.
0015 Radio Beijing: Current Affairs. See M 1115.
0030 BBC: Music Feature. This month, hear "Music And The Movies," with a look at the relationship between the two media.
0037 Radio Netherlands: Newsline. See S 0037.
0040 Radio Beijing: Culture in China. See H 1140.
0052 Radio Netherlands: Media Network. See H 1152.

Saturdays

0010 Kol Israel: Shabbat Shalom. Listener record requests for the Jewish Sabbath.
0015 Radio Beijing: Current Affairs or The Business Show. See F 1115.
0030 BBC: From The Weeklies. A review of the British weekly press.
0037 Radio Netherlands: Newsline. See S 0037.
0040 Radio Beijing: In the Third World. See F 1140.
0045 BBC: Recording Of The Week. See S 0315.
0052 Radio Netherlands: Sounds Interesting. See F 1152.

0100 UTC [9:00 PM EDT/6:00 PM PDT]

FREQUENCIES

0100-0105		Vatican Radio, Vatican City	6150$_{na}$	9605$_{na}$	
0100-0115		All India Radio, Delhi	9535$_{as}$	9910$_{as}$	11715$_{as}$
			11745$_{as}$	15110$_{as}$	
0100-0120		RAI, Rome, Italy	9575$_{am}$	11800$_{am}$	
0100-0125		Kol Israel, Jerusalem	9435$_{na}$	11605$_{na}$	15640na
0100-0125		Radio Netherlands, Hilversum	6020$_{am}$	6165$_{am}$	15560$_{am}$
0100-0130	sm	Radio Norway, Oslo	11925na	15360na	
0100-0130		Nat'l Radio of Laos, Vientiane	7112$_{as}$		
0100-0130		Radio Canada Int'l, Montreal	9535am	9755am	11845am
			11940am	13720am	
0100-0130		Radio Prague, Czechoslovakia	5930$_{na}$	7345$_{na}$	9540$_{na}$
0100-0130		Radio Sweden, Stockholm	9765$_{as}$		
0100-0150		Deutsche Welle, Koln, Germany	6040$_{na}$	6145$_{na}$	6155na
			9565$_{na}$	11865$_{na}$	
			11890$_{na}$	13610$_{na}$	13770$_{na}$
			15205$_{na}$	15425na	
0100-0200	sm	Radio Canada Int'l, Montreal	9535ca	9755ca	11845ca
			11940ca	13720ca	
0100-0200	twhfa	RAE, Buenos Aires, Argentina	11710$_{na}$		
0100-0200		ABC Brisbane, Australia	4920$_{do}$	9660$_{do}$	
0100-0200		ABC Perth, Australia	9610$_{do}$		
0100-0200		CFRB, Montreal	6070$_{do}$		
0100-0200		CBN, Canada	6160$_{do}$		
0100-0200		FEBC Radio Int'l, Philippines	15450$_{as}$		
0100-0200		Radio Moscow World Service	7370$_{va}$	17655$_{va}$	17890$_{va}$
			21690$_{as}$	21790$_{as}$	
0100-0200		Radio Australia, Melbourne	15160va	15240$_{va}$	15320$_{va}$
			17630$_{va}$	17715$_{va}$	17750$_{va}$
			17795$_{va}$	21740	
0100-0200		Radio Moscow N. American Svc	9530$_{na}$	9685$_{na}$	9720$_{na}$
			11735$_{na}$	11850$_{na}$	11860$_{na}$
			11950$_{na}$	12050$_{na}$	15425$_{na}$
			17605$_{na}$	17665$_{na}$	17700$_{na}$
			21480$_{na}$		
0100-0200		Radio for Peace Int'l, Costa Rica	7375	13630	21566
0100-0200		Radio Havana Cuba	11820$_{am}$		
0100-0200		Radio Luxembourg	6090$_{om}$	15350$_{om}$	
0100-0200		Radio New Zealand Int'l	17770$_{pa}$		
0100-0200		Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
0100-0200	smtwh	RTV Malaysia, Radio 4	7295$_{do}$		
0100-0200		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0100-0200		WRNO New Orleans, Louisiana	7355$_{na}$		
0100-0200		KVOH Los Angeles, California	17775$_{na}$		
0100-0200		KTBN Salt Lake City, Utah	7510$_{na}$		
0100-0200		Christian Science World Service	7395$_{na}$	9850$_{na}$	13760$_{na}$
			17555na	17865va	
0100-0200		WYFR Okeechobee, Florida	6065$_{na}$	11855$_{na}$	
			15440$_{na}$		
0100-0200		WINB Red Lion, Pennsylvania	15145$_{na}$		
0100-0200		WWCR Nashville, Tennessee	7520$_{na}$		
0100-0200		BBC London, England	5965$_{va}$	5975$_{va}$	6175$_{va}$
			7325$_{va}$	9580$_{va}$	9590$_{va}$
			9915$_{va}$	11750$_{va}$	11955$_{va}$
			15260$_{va}$	15280$_{va}$	15360$_{va}$
			21715$_{va}$		
0100-0200		Spanish Foreign Radio, Madrid	9630$_{na}$	11880$_{na}$	
0100-0200		HCJB Quito, Ecuador	9745$_{am}$	15155$_{am}$	21455$_{am}$
			25950$_{am}$		
0100-0200		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0100-0200		Sri Lanka B'casting Corp.	6005$_{as}$	9720$_{as}$	15425$_{as}$
0100-0200		Voice of America, Washington	6095va	6125va	7115$_{as}$
			7205$_{as}$	11705$_{as}$	15160as
			15250$_{as}$	17740as	21550as
0100-0200		Radio Luxembourg	15350$_{om}$		
0100-0200		Voice of America, Washington	5995$_{ca}$	6130$_{ca}$	9455$_{ca}$
			9775$_{ca}$	9815$_{ca}$	11580$_{ca}$
			15205$_{ca}$		
0100-0200		Voice of Indonesia, Jakarta	11752$_{as}$	11785$_{as}$	
0130-0145	whas	Radio Budapest, Hungary	6110$_{am}$	9520$_{am}$	9585$_{am}$
			9835$_{am}$	11910$_{am}$	15160$_{am}$
0130-0140	mtwhfa	Voice of Greece, Athens	9395$_{am}$	9420$_{am}$	11645$_{am}$
0130-0145	twfa	Radio Budapest, Hungary	6110$_{am}$	9520$_{am}$	9585$_{am}$
			9835$_{am}$	11910$_{am}$	15160$_{am}$
0130-0200		Peace & Progress, Moscow, USSR	7400$_{na}$	9750$_{na}$	15180$_{na}$
			17690$_{na}$	17720$_{na}$	
0130-0200		Radio Austria Int'l, Vienna	9870$_{sa}$	9875$_{na}$	13730$_{na}$
0130-0200		United Arab Emirates R., Dubai	11795$_{na}$	13695$_{eu}$	15320$_{eu}$
			15435$_{eu}$		
0130-0200	mwf	Alma Alta Radio, USSR	5035do	5915do	6135do
0130-0200		Radio Tashkent, Alma Ata	7335na		
0145-0200		Vatican Radio, Vatican City	7125$_{as}$	9650$_{as}$	11750$_{as}$

PROGRAMS

Sundays

0100 Radio Norway Int'l: Norway Today. A magazine program on issues and people affecting modern-day Norway.
0101 BBC: Play Of The Week. Hour-long drama selections from the BBC's crack production team.
0109 Deutsche Welle: Commentary. Opinion on current issues.
0110 Kol Israel: Spotlight. See S 0010.
0117 Deutsche Welle: Feature. "Mailbag," "Phone-in," or "To The Top" (the German pop scene), presented on a rotating basis.
0134 Deutsche Welle: German by Radio. An advanced German language course for English speakers.

Mondays

0100 Radio Norway Int'l: Norway Today. See S 0100.
0101 BBC: Feature/Drama. Topical programming on various subjects, or a dramatic production.
0109 Deutsche Welle: Commentary. See S 0109.
0110 Kol Israel: Calling All Listeners. See S 2310.
0116 Deutsche Welle: Living in Germany. A weekly look at the social scene in Germany.
0134 Deutsche Welle: Larry's Random Selection. Larry Wayne takes a look at Germany from the lighter side.
0145 BBC: Classical Music. A short feature on various classical music topics.

Tuesdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0110 Kol Israel: Spectrum. See M 2310.
0130 BBC: Music. The always-alternating "Folk In Britain" (4th/18th); "Jazz Now And Then" (11th/25th).
0134 Deutsche Welle: Transatlantic Diary. Cultural, science, and economic developments between the U and Germany.
0145 BBC: Health Matters. See M 1115.

Wednesdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0110 Kol Israel: With Me In the Studio. See T 2310.
0130 BBC: Talks. News from the world of communications can be heard in "Mediawatch"; the current series ends this month.
0134 Deutsche Welle: Transatlantic Diary. See T 0134.
0145 BBC: Country Style. David Allan profiles the country music scene on both sides of the pond.

Thursdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0110 Kol Israel: With Me In the Studio. See T 2310.
0130 BBC: Waveguide. See M 0530.
0134 Deutsche Welle: Transatlantic Diary. See T 0134.
0140 BBC: Book Choice. See T 1125.
0145 BBC: The Farming World. Agricultural news and technological innovations for farmers.

Fridays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0110 Kol Israel: This Land. See H 2310.
0130 BBC: Seven Seas. Malcolm Billings presents news about ships and the sea.
0134 Deutsche Welle: Transatlantic Diary. See T 0134.

Chao Xueren and Wei Hua interviewing Geraldine Ferraro when she visited China.

0145 BBC: Global Concerns. An update on environmental issues.

Saturdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0110 Kol Israel: Thank Goodness It's Friday. See F 2315.
0130 BBC: Short Story (except 1st: "Seeing Stars"). See S 1115.
0134 Deutsche Welle: Through German Eyes. See S 1513.
0145 BBC: Here's Humph! All that jazz with Humphrey Lyttelton.

0200 UTC [10:00 PM EDT/7:00 PM PDT]

FREQUENCIES

0200-0230		FEBC Radio Int'l, Philippines	15450as
0200-0230	sm	Radio Norway, Oslo	15360na
0200-0230		Radio Sweden, Stockholm	9695na 11705na
0200-0230	s	Radio Budapest, Hungary	6110am 9520am 9585am 9835am 11910am 15160am
0200-0230		Radio Finland, Helsinki	15185na 15430na
0200-0230		Sri Lanka B'casting Corp.	6005as 9720as 15425as
0200-0230		Swiss Radio Int'l, Bern	6125am 6135am 9650am 9885am 12035am 17730am
0200-0230	mtwhf	Voice of America, Washington	5995ca 9775ca 9815ca 11580ca 15205ca
0200-0230	mtwhfa	Voice of Kenya, Nairobi	6075do
0200-0250		Deutsche Welle, Koln, Germany	7285as 9615as 15235as 9690as 11945as 11965as
0200-0300	twhfa	Radio Canada Int'l, Montreal	9535ca 9755ca 11845ca 11940ca 13720ca
0200-0300		Radio Cairo, Egypt	9475na 9675na
0200-0300		Radio Havana Cuba	9505am 11820am
0200-0300		ABC Brisbane, Australia	4920do 9660do
0200-0300		Radio Australia, Melbourne	15160va 15240va 15320va 17630va 17715va 17750va 17795va 21740
0200-0300		ABC Perth, Australia	9610do
0200-0300		CFRB, Montreal	6070do
0200-0300		CBN, Canada	6160do
0200-0300		Radio Australia, Melbourne	11880pa 15160pa 15240as 15530as 17630va 17750as 17795pa 17855va 21525va 21740na 21775na
0200-0300		Radio for Peace Int'l, Costa Rica	7375 13630 21566
0200-0300		HCJB Quito, Ecuador	9745na 15155na 17875sa
0200-0300		WRNO New Orleans, Louisiana	7355am
0200-0300		KTBN Salt Lake City, Utah	7510am
0200-0300		WHRI Noblesville, Indiana	7315na 9495sa
0200-0300		WINB Red Lion, Pennsylvania	15145eu
0200-0300		WWCR Nashville, Tennessee	7520na
0200-0300		WYFR Okeechobee, Florida	6065na 15440na
0200-0300		Radio Luxembourg	6090om 15350om
0200-0300	m	Radio New York Intl.(via WWCR)	7435va
0200-0300		Radio New Zealand Int'l	17770pa
0200-0300		BBC London, England	5975va 6005va 6175va 7325va 9410va 9515va 9590va 9915va 11750va 12095va 15260va 15390va 21715va
0200-0300		Radio Romania Int'l, Bucharest	5990am 9510am 9570am 11830am 11940am 15380am
0200-0300		Radio Thailand, Bangkok	4830as 9655as 11905as
0200-0300	smtwh	RTV Malaysia, Radio 4	7295do
0200-0300		SBC Radio 1, Singapore	5052do 11940do
0200-0300		SLBS, Freetown, Sierra Leone	3316do
0200-0300		Radio Moscow N. American Svc	9530na 9685na 9720na 11735na 11850na 11860na 11950na 12050na 15425na 17605na 17665na 17700na 21480na
0200-0300		Radio Cultura, Guatemala	3300do
0200-0300		Radio Moscow World Service	7370va
0200-0300		Christian Science World Service	9455eu 9850eu 13760eu 17555eu 17865va
0200-0300		Voice of America, Washington	7115as 7205as 11705as 15115as 15160as 15250as 17740as 21550as
0200-0300		Voice of Free China, Taiwan	5950na 9680na 9765pa 11740ca 11860as 15345as
0230-0300		Sri Lanka B'casting Corp.	9720as 15425as
0230-0245		Radio Pakistan, Islamabad	9545as 15115as 17640as
0230-0300	twhfa	Radio Portugal, Lisbon	9555sa 9600na 9705na 11840sa
0230-0300		Radio Baghdad, Iraq	11860na
0230-0300		Radio Tirana, Albania	9760na 11825na
0230-0300	s	Voice of Kenya, Nairobi	6075do
0240-0300		Radio 2, Lusaka, Zambia	6165do 7235do
0245-0300		Radio Korea, Seoul	15575va
0249-0300		Radio Yerevan, Armenia	11790na 13645na 15180na 15455na 15485na

PROGRAMS

Sundays

0200 Radio Norway Int'l: Norway Today. See S 0100.
0209 Deutsche Welle: Commentary. See S 0109.
0213 Deutsche Welle: Sports Report. The latest news from the world of sports.
0219 Deutsche Welle: Mailbag Asia. Musical requests and answers to listener questions.
0230 BBC: Feature. Topical programming on various subjects.

Mondays

0200 Radio Norway Int'l: Norway Today. See S 0100.
0209 Deutsche Welle: European Journal. A review of major events in Europe, with interviews and analyses.
0230 BBC: Composer Of The Month. Profiles of famous composers.
0234 Deutsche Welle: Science and Technology. New scientific and technological developments.

Tuesdays

0209 Deutsche Welle: European Journal. See M 0209.
0230 BBC: Sports International. Topical features and reports on sports the world over.
0234 Deutsche Welle: Man and Environment. A program on all topics relating to the environment in industrial and developing countries.

Wednesdays

0209 Deutsche Welle: European Journal. See M 0209.
0230 BBC: Development '91. Aid and development issues for developing nations.
0234 Deutsche Welle: Insight. See T 1534.

Thursdays

0209 Deutsche Welle: European Journal. See M 0209.
0230 BBC: Assignment. An in-depth examination of a topical issue from the news.
0234 Deutsche Welle: Living in Germany. See M 0116.

Fridays

0209 Deutsche Welle: European Journal. See M 0209.
0230 BBC: Drama. See H 1130.
0234 Deutsche Welle: Spotlight on Sport. See W 1534.

Saturdays

0209 Deutsche Welle: Commentary. See S 0109.
0223 Deutsche Welle: Panorama. A review of the major news events of the week.
0230 BBC: People And Politics. The background to the British political scene.
0234 Deutsche Welle: Economic Notebook. See F 1534.

Radio Norway International's Broadcasting House in Oslo, Norway.

English language

shortwave guide

0300 UTC [11:00 PM EDT/8:00 PM PDT]

FREQUENCIES

0300-0330	Radio Cairo, Egypt	9475$_{na}$ 9675$_{na}$
0300-0330	Radio Japan, Tokyo	5960$_{na}$ 15325$_{na}$ 17825$_{na}$ 21610$_{na}$
0300-0330	Radio Prague, Czechoslovakia	5930$_{na}$ 7345$_{na}$ 9540$_{na}$
0300-0330	Voice of America, Washington	6095$_{va}$ 15160$_{va}$ 15195va 17810$_{va}$ 17865$_{va}$
0300-0350	Deutsche Welle, Koln, Germany	6085$_{na}$ 6145$_{na}$ 9545na 11810na 11890na 13610na 13770na 15205na 15425na
0300-0400	Radio 2, Lusaka, Zambia	6165$_{do}$ 7235$_{do}$
0300-0400	Radio Moscow World Service	9720na 11780eu 11850na 11980as 15280eu
0300-0400	Radio Baghdad, Iraq	11860$_{na}$
0300-0400	Radio Beijing, China	9690$_{am}$ 9770$_{am}$ 11715$_{am}$
0300-0400	Radio Havana Cuba	9505$_{am}$ 11820$_{am}$
0300-0400	BBC London, England	5975$_{va}$ 6005$_{va}$ 6175$_{va}$ 6195$_{va}$ 7325$_{va}$ 9410$_{va}$ 9600af 9915eu 11750$_{va}$ 11955pa 12095eu 15070va
0300-0400	Radio Luxembourg	15350$_{om}$
0300-0400	ABC Brisbane, Australia	4920$_{do}$ 9660$_{do}$
0300-0400	Radio Luxembourg	15350om
0300-0400	Voice of Turkey, Ankara	9445na
0300-0400	Radio Sofia, Bulgaria	11720na 15160af 15290na 15310af 17825af
0300-0400	Radio Australia, Melbourne	15160va 15240$_{va}$ 15320$_{va}$ 17630$_{va}$ 17715$_{va}$ 17750$_{va}$ 17795$_{va}$ 21740
0300-0400	ABC Perth, Australia	9610$_{do}$
0300-0400	CFRB, Montreal	6070$_{do}$
0300-0400	CBN, Canada	6160$_{do}$
0300-0400	Radio New Zealand Int'l	17770$_{pa}$
0300-0400	Radio for Peace Int'l, Costa Rica	7375 13630 21566
0300-0400	Radio Tanzania, Dar es Salaam	5985$_{af}$ 9685$_{af}$ 11765$_{af}$
0300-0400	Radio Thailand, Bangkok	4830$_{as}$ 9655$_{as}$ 11905$_{as}$
0300-0400	HCJB Quito, Ecuador	9745$_{na}$ 15155$_{na}$
0300-0400	WRNO New Orleans, Louisiana	7355$_{am}$
0300-0400	KTBN Salt Lake City, Utah	7510$_{am}$
0300-0400	WHRI Noblesville, Indiana	7315$_{na}$ 9495$_{sa}$
0300-0400	Christian Science World Service	9455$_{na}$ 9850na 13760na 17555na 17865va
0300-0400	Radio Cultura, Guatemala	3300$_{do}$
0300-0400	WWCR Nashville, Tennessee	7520$_{na}$
0300-0400	WYFR Okeechobee, Florida	6065$_{na}$ 9505$_{na}$
0300-0400	Radio Luxembourg	15350$_{eu}$
0300-0400	Trans World Radio Bonaire	9535$_{am}$ 11930$_{am}$
0300-0400 smtwh	RTV Malaysia, Radio 4	7295$_{do}$
0300-0400	SBC Radio 1, Singapore	5052$_{do}$ 11940$_{do}$
0300-0400	SLBS, Freetown, Sierra Leone	3316$_{do}$
0300-0400	Sri Lanka B'casting Corp.	9720$_{as}$ 15425$_{as}$
0300-0400	Voice of America, Washington	6035$_{af}$ 9575$_{af}$ 11835$_{af}$ 15115$_{af}$ 17715$_{af}$ 21600$_{af}$
0300-0400	Voice of Kenya, Nairobi	6075$_{do}$
0310-0325	Vatican Radio, Vatican City	9635$_{na}$
0325-0400 mtwhfa	Zimbabwe BC Corp., Harare	3396$_{do}$
0330-0400	Radio Netherlands, Hilversum	6165am 9590$_{am}$
0330-0400	Radio Sweden, Stockholm	9695$_{na}$ 11705$_{na}$
0330-0400	Radio Tirana, Albania	9760$_{na}$ 11825$_{na}$
0330-0400	UAE Radio, Dubai	11945$_{na}$ 13675$_{na}$ 15400$_{na}$ 15435$_{na}$
0340-0350 mtwhfa	Voice of Greece, Athens	9395$_{am}$ 9420$_{am}$ 11645$_{am}$
0350-0400	RAI, Rome, Italy	11905$_{as}$ 15330$_{as}$ 17795$_{as}$

PROGRAMS

Sundays

0309 Deutsche Welle: Commentary. See S 0109.
0315 BBC: Recording Of The Week. A personal choice from the new classical music releases.
0315 Radio Beijing: Press Clippings. See S 0015.
0317 Deutsche Welle: Feature. See S 0117.
0320 Radio Beijing: Travel Talk. See S 0020.
0328 Radio Beijing: Cooking Show. See S 0028.
0330 BBC: From Our Own Correspondent. Reporters comment on the background to the news.
0334 Deutsche Welle: German by Radio. See S 0134.
0335 Radio Beijing: Music from China. See S 0035.
0337 Radio Netherlands: Newsline. See S 0037.
0350 BBC: Write On. Listener letters, opinions, and questions.
0352 Radio Netherlands: Rembrandt Express. See S 0052.

Mondays

0309 Deutsche Welle: Commentary. See S 0109.
0315 BBC: Good Books. Recommendations of books to read.
0315 Radio Beijing: China Anthology. See S 1115.
0316 Deutsche Welle: Living in Germany. See M 0116.
0325 Radio Beijing: Music Album. See S 1125.
0330 BBC: Anything Goes. See S 1430.
0330 Radio Netherlands: Happy Station. See S 1130.
0334 Deutsche Welle: Larry's Random Selection. See M 0134.
0340 Radio Beijing: Listeners' Letterbox. See S 1140.

Tuesdays

0309 Deutsche Welle: European Journal. See M 0209.
0315 BBC: The World Today. See M 1645.
0315 Radio Beijing: Current Affairs. See M 1115.
0330 BBC: John Peel. Newly released albums and singles from the contemporary music scene.
0334 Deutsche Welle: Transatlantic Diary. See T 0134.
0337 Radio Netherlands: Newsline. See S 0037.
0340 Radio Beijing: Learn to Speak Chinese. See M 1140.
0352 Radio Netherlands: Research File. See M 1152.

Rwanda's Foreign Minister, Dr. Casimir Bizimungu, signs an agreement with Deutsche Welle's Director General, Dieter Weirich, extending DW's license for a relay station in Kigali.

Wednesdays

0309 Deutsche Welle: European Journal. See M 0209.
0315 BBC: The World Today. See M 1645.
0315 Radio Beijing: Current Affairs. See M 1115.
0330 BBC: Discovery. An in-depth look at scientific research.
0334 Deutsche Welle: Transatlantic Diary. See T 0134.
0337 Radio Netherlands: Newsline. See S 0037.
0340 Radio Beijing: Listeners' Letterbox. See S 1140.
0352 Radio Netherlands: Images. See T 1152.

Thursdays

0309 Deutsche Welle: European Journal. See M 0209.
0315 BBC: The World Today. See M 1645.
0315 Radio Beijing: Current Affairs. See M 1115.
0330 BBC: Quiz. See M 1215.
0334 Deutsche Welle: Transatlantic Diary. See T 0134.
0337 Radio Netherlands: Newsline. See S 0037.
0340 Radio Beijing: Learn to Speak Chinese. See M 1140.
0352 Radio Netherlands: Feature. See W 1152.

Fridays

0309 Deutsche Welle: European Journal. See M 0209.
0315 BBC: The World Today. See M 1645.
0315 Radio Beijing: Current Affairs. See M 1115.
0330 BBC: Focus On Faith. Comment and discussion on major issues in various religions.
0334 Deutsche Welle: Transatlantic Diary. See T 0134.
0334 Deutsche Welle: Transatlantic Diary. See T 0134.
0337 Radio Netherlands: Newsline. See S 0037.
0340 Radio Beijing: Culture in China. See H 1140.
0352 Radio Netherlands: Media Network. See H 1152.

Saturdays

0309 Deutsche Welle: European Journal. See M 0209.
0315 BBC: The World Today. See M 1645.
0315 Radio Beijing: Current Affairs or The Business Show. See F 1115.
0330 BBC: The Vintage Chart Show. Paul Burnett with past Top 20 pop music hits.
0334 Deutsche Welle: Through German Eyes. See S 1513.
0337 Radio Netherlands: Newsline. See S 0037.
0340 Radio Beijing: In the Third World. See F 1140.
0352 Radio Netherlands: Sounds Interesting. See F 1152.

English language

shortwave guide

0400 UTC [12:00 AM EDT/9:00 PM PDT]

FREQUENCIES

0400-0410		RAI, Rome, Italy	11905$_{as}$	15330$_{as}$	17795$_{as}$
0400-0415		Kol Israel, Jerusalem	9435$_{na}$	11605na	11655na
			15640$_{na}$	17575$_{as}$	
0400-0415		Radio Prague, Czechoslovakia	5930$_{na}$	7345$_{na}$	9540$_{na}$
0400-0425		Radio Cultura, Guatemala	3300$_{do}$		
0400-0425		Radio Netherlands, Hilversum	6165$_{am}$	9590$_{am}$	
0400-0430	sm	Radio Norway, Oslo	11865na		
0400-0430		Radio Canada Int'l, Montreal	15275me		
0400-0430		Voice of America	5995eu	6040eu	6140eu
			7170eu	7200eu	11825eu
			15115eu	15205eu	
0400-0430		Radio Baghdad, Iraq	11860$_{na}$		
0400-0430		Radio Romania Int'l, Bucharest	5990$_{am}$	9510$_{am}$	9570$_{am}$
			11830$_{am}$	11940$_{am}$	15380$_{am}$
0400-0430		Trans World Radio, Bonaire	9535am	11930am	
0400-0430		Radio Tanzania, Dar es Salaam	5985$_{af}$	9685$_{af}$	11765$_{af}$
0400-0430		Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
0400-0430		Sri Lanka B'casting Corp.	9720$_{as}$	15425$_{as}$	
0400-0430		Swiss Radio Int'l, Bern	6135$_{am}$	9650$_{am}$	9885$_{am}$
			12035$_{am}$		
0400-0430		Voice of America, Washington	6035$_{af}$	9575$_{af}$	11835$_{af}$
			15350$_{af}$	17715$_{af}$	21600$_{af}$
0400-0450		Deutsche Welle, Koln, Germany	6145$_{af}$	7150$_{af}$	7225$_{af}$
			9565$_{af}$	9765$_{af}$	11765$_{af}$
			11890$_{af}$	13610$_{af}$	13770$_{af}$
			15425$_{af}$		
0400-0450		Radio Havana Cuba	9505$_{am}$	9750$_{am}$	11760$_{am}$
			11820$_{am}$		
0400-0500		Radio for Peace Int'l, Costa Rica	7375	13630	21566
0400-0500		BBC London, England	5975$_{va}$	6175$_{va}$	6195$_{va}$
			7120$_{va}$	9410$_{va}$	9600$_{va}$
			9610$_{va}$	9915$_{va}$	12095$_{va}$
			15070$_{va}$	15280$_{va}$	15400$_{va}$
			15420$_{va}$		
0400-0500		Radio Cultura, Guatemala	3300$_{do}$		
0400-0500		ABC Brisbane, Australia	4920$_{do}$	9660$_{do}$	
0400-0500		ABC Perth, Australia	9610$_{do}$		
0400-0500		CFRB, Montreal	6070$_{do}$		
0400-0500		CBN, Canada	6160$_{do}$		
0400-0500		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
0400-0500		Radio Beijing, China	11840$_{am}$		
0400-0500		Radio Moscow World Service	9720na	11780eu	11850na
			11980as	15280eu	
0400-0500		HCJB Quito, Ecuador	9745$_{na}$	15155$_{na}$	
0400-0500		WRNO New Orleans, Louisiana	6185$_{am}$		
0400-0500		KVOH Los Angeles, California	9785$_{am}$		
0400-0500		KTBN Salt Lake City, Utah	7510$_{am}$		
0400-0500		WHRI Noblesville, Indiana	7315$_{na}$	9495$_{sa}$	
0400-0500		Radio Australia, Melbourne	15320$_{va}$	15530$_{va}$	17630$_{va}$
			17715$_{va}$	17795$_{va}$	21525$_{va}$
			21775va		
0400-0500		Christian Science World Service	9455$_{eu}$	9840$_{eu}$	13760$_{eu}$
			17555$_{eu}$	17780va	
0400-0500		WWCR Nashville, Tennessee	7520$_{na}$		
0400-0500		WYFR Okeechobee, Florida	6065$_{na}$	9505$_{na}$	
0400-0500		Radio Luxembourg	15350$_{om}$		
0400-0500	smtwhf	Radio New Zealand Int'l	17770$_{pa}$		
0400-0500		Radio Pyongyang, North Korea	15180$_{as}$	15230$_{as}$	17765$_{as}$
0400-0500		Radio RSA, South Africa	7270$_{af}$	11900$_{af}$	11920$_{af}$
0400-0500	smtwh	RTV Malaysia, Radio 4	7295$_{do}$		
0400-0500		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0400-0500		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0400-0500		Voice of America, Washington	5995$_{va}$	6140$_{va}$	7170$_{va}$
			7200$_{va}$	9715$_{va}$	
0400-0500		Voice of Kenya, Nairobi	6075$_{do}$		
0400-0430		Trans World Radio, Bonaire	9535$_{am}$	11930$_{am}$	
0400-0500		Radio Canada Int'l, Montreal	11925$_{as}$		
0400-0500	smtwhf	WMLK Bethel, PA	9465$_{eu}$		
0400-0500	mtwhfa	Zimbabwe BC Corp., Harare	3396$_{do}$		
0400-0425		RAI, Rome, Italy	5990$_{me}$	7275$_{me}$	
0430-0500		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
0430-0500	mtwhf	Radio Southwest Africa, Namibia	3270$_{af}$	3290$_{af}$	
0430-0500		Radio Tirana, Albania	9480$_{af}$	11835$_{af}$	
0430-0500	s	Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
0430-0500		TWR Swaziland	9655af	11750af	
0430-0500		Voice of America	3980eu	5995eu	6040eu
			6140eu	7170eu	7200eu
			11825eu	15205eu	
0430-0500		Voice of America, Washington	6035$_{af}$	9575$_{af}$	15115$_{af}$
			17715$_{af}$	21600$_{af}$	
0450-0500		Radio Havana Cuba	9750$_{am}$	11760$_{am}$	11820$_{am}$

PROGRAMS

Sundays

0400 Radio Norway Int'l: Norway Today. See S 0100.
0409 Deutsche Welle: Commentary. See S 0109.
0413 Deutsche Welle: Sports Report. See S 0213.
0415 Radio Beijing: Press Clippings. See S 0015.
0419 Deutsche Welle: International Talking Point. A round-table discussion on major trends and events.
0420 Radio Beijing: Travel Talk. See S 0020.
0428 Radio Beijing: Cooking Show. See S 0028.
0430 BBC: Pop Music. The current series is "Pop Into The Movies" (2nd/9th/16th/23rd), with a new series from the 30th.
0434 Deutsche Welle: People and Places. Interviews, stories, and music beamed to Africa.
0435 Radio Beijing: Music from China. See S 0035.
0445 BBC: Talks. Education worldwide is the focus of "The Learning World" (through July 21st)

Mondays

0400 Radio Norway Int'l: Norway Today. See S 0100.
0409 Deutsche Welle: European Journal. See M 0209.
0415 Radio Beijing: China Anthology. See S 1115.
0425 Radio Beijing: Music Album. See S 1125.
0430 BBC: Off The Shelf. Serialized readings from some of the world's great books.
0434 Deutsche Welle: Africa in the German Press. A look at what German papers and weeklies have to say about Africa.
0440 Radio Beijing: Listeners' Letterbox. See S 1140.
0445 BBC: Andy Kershaw's World Of Music. Exotic music from the world over.

Paul Jones spins rhythm 'n' blues tracks on the BBC's "Counterpoint."

Tuesdays

0409 Deutsche Welle: European Journal. See M 0209.
0415 Radio Beijing: Current Affairs. See M 1115.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: Africa Report. Reports and background to the news from correspondents.
0440 Radio Beijing: Learn to Speak Chinese. See M 1140.
0445 BBC: Europe's World. Life in Europe and its links with the rest of the world.

Wednesdays

0409 Deutsche Welle: European Journal. See M 0209.
0415 Radio Beijing: Current Affairs. See M 1115.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: Africa Report. See T 0434.
0440 Radio Beijing: Listeners' Letterbox. See S 1140.
0445 BBC: Country Style. See W 0145.

Thursdays

0409 Deutsche Welle: European Journal. See M 0209.
0415 Radio Beijing: Current Affairs. See M 1115.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: Africa Report. See T 0434.
0440 Radio Beijing: Learn to Speak Chinese. See M 1140.
0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

0409 Deutsche Welle: European Journal. See M 0209.
0415 Radio Beijing: Current Affairs. See M 1115.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: Africa Report. See T 0434.
0440 Radio Beijing: Culture in China. See H 1140.
0445 BBC: Music. See T 0130.

Saturdays

0409 Deutsche Welle: Commentary. See S 0109.
0415 Radio Beijing: Current Affairs or The Business Show. See F 1115.
0423 Deutsche Welle: Panorama. See A 0223.
0430 BBC: Here's Humph! See A 0145.
0434 Deutsche Welle: Man and Environment. See T 0234.
0440 Radio Beijing: In the Third World. See F 1140.
0445 BBC: Worldbrief. See F 2315.

0500 UTC [1:00 AM EST/10:00 PM PDT]

FREQUENCIES

0500-0510	w	Malawi B'casting Corp., Blantyre	3381$_{do}$			
0500-0530		CRTV Buea, Cameroon	3970$_{do}$			
0500-0530		Voice of America	3980$_{eu}$	5995$_{eu}$	6040$_{eu}$	
			6140$_{eu}$	7170$_{eu}$	7200$_{eu}$	
			11825$_{eu}$	15205$_{eu}$		
0500-0530		TWR Swaziland	9655$_{do}$	11750$_{do}$		
0500-0530		Vatican Radio, Vatican City	6185$_{eu}$	6248$_{eu}$	17710$_{af}$	
			17730$_{af}$	21650$_{af}$		
0500-0530	mtwhfa	Zimbabwe BC Corp., Harare	3396$_{do}$			
0500-0550		Deutsche Welle, Koln, Germany	5960$_{na}$	6120$_{na}$	9760$_{na}$	
			9700$_{na}$	11890$_{na}$	13610$_{na}$	
			11705$_{na}$	13790$_{na}$		
0500-0600		Christian Science World Service	9455$_{eu}$	9840$_{eu}$	13760$_{eu}$	
			17555$_{eu}$	17780va		
0500-0600		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$		
0500-0600		Radio New Zealand Int'l	17770$_{pa}$			
0500-0600		Spanish Foreign Radio, Madrid	9630$_{na}$			
0500-0600		Radio Beijing, China	11840$_{am}$			
0500-0600	sa	Radio E.Africa, Equatorial Guinea	9585$_{af}$			
0500-0600		Radio Havana Cuba	9750$_{am}$	11760$_{am}$	11820$_{am}$	
0500-0600		Radio Luxembourg	15350$_{om}$			
0500-0600	m	Radio New York Intl,(via WWCR)	7435$_{va}$			
0500-0600		Radio Moscow World Service	9720na	11780eu	11850na	
			11980as	15280eu		
0500-0600		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$		
0500-0600	mtwhf	Radio Southwest Africa, Namibia	3270$_{af}$	3290$_{af}$		
0500-0600		Radio Japan, Tokyo	17765$_{na}$	17810$_{na}$	17825$_{na}$	
			17890na	21610na		
0500-0600		HCJB Quito, Ecuador	9745$_{na}$	15155$_{na}$		
0500-0600		WRNO New Orleans, Louisiana	6185$_{am}$			
0500-0600		KTBN Salt Lake City, Utah	7510$_{am}$			
0500-0600		ABC Brisbane, Australia	4920$_{do}$	9660$_{do}$		
0500-0600		ABC Perth, Australia	9610$_{do}$			
0500-0600		Radio for Peace Int'l, Costa Rica	7375	13630	21566	
0500-0600		CFRB, Montreal	6070$_{do}$			
0500-0600		CBN, Canada	6160$_{do}$			
0500-0600		KVOH Los Angeles, California	9785$_{am}$			
0500-0600		WHRI Noblesville, Indiana	7315$_{na}$	9495$_{sa}$		
0500-0600		WINB Red Lion, Pennsylvania	15145$_{eu}$			
0500-0600		WWCR Nashville, Tennessee	7520$_{na}$			
0500-0600		Radio Australia, Melbourne	15320$_{va}$	15530$_{va}$	17630$_{va}$	
			17715$_{va}$	17795$_{va}$	21525$_{va}$	
			21740$_{va}$	21775		
0500-0600		WYFR Okeechobee, Florida	5985$_{na}$	11580$_{am}$	15566eu	
0500-0600		Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$	
0500-0600	s	Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$	
0500-0600		RTV Malaysia, Radio 4	7295$_{do}$			
0500-0600		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$		
0500-0600		SLBS, Freetown, Sierra Leone	3316$_{do}$			
0500-0600		Voice of America, Washington	6035$_{af}$	9575$_{af}$	15115$_{af}$	
			17715$_{af}$			
0500-0600		Voice of America, Washington	5995$_{va}$	6060$_{va}$	6140$_{va}$	
			7170$_{va}$	7200$_{va}$	9670$_{va}$	
			9700$_{va}$	9715$_{va}$	11825$_{va}$	
			15205$_{va}$			
0500-0600		BBC London, England	3955$_{va}$	5975$_{va}$	6005$_{va}$	
			6180$_{va}$	6190$_{va}$	6195$_{va}$	
			7120$_{va}$	7230$_{va}$	9410$_{va}$	
			9600$_{af}$	9640$_{af}$	9915$_{na}$	
			11760$_{eu}$	11940$_{af}$	12095$_{pa}$	
			15070$_{eu}$	15280$_{pa}$	15310$_{me}$	
			15400$_{af}$	15420$_{af}$	15590$_{me}$	
			21715$_{af}$			
0500-0600		Voice of Kenya, Nairobi	6075$_{do}$			
0500-0600		Voice of Nigeria, Lagos	7255$_{af}$			
0510-0515	w	Radio Botswana, Gaborone	5955$_{af}$	7255$_{af}$		
0515-0600	mtwhf	Radio Canada Int'l, Montreal	6050eu	6150eu	7295eu	
			9750eu	11775eu	17840eu	
0524-0600	f	Radio 2, Accra, Ghana	3366$_{do}$			
0526-0600		Radio 1, Accra, Ghana[1]	4915$_{do}$			
0530-0545		BBC English by Radio, London	6050$_{eu}$	7210$_{eu}$	9750$_{eu}$	
0530-0600		Radio Tirana, Albania	7205eu	9500eu		
0530-0600		Voice of America	3980eu	5995eu	6040eu	
			6060eu	6140eu	7170eu	
			7200eu	11825eu	15205eu	
0530-0600		Cameroon Radio-TV, Yaounde	4850$_{do}$			
0530-0600		Radio Austria Int'l, Vienna	6015$_{na}$	6155$_{eu}$	13730$_{eu}$	
			15410$_{me}$	21490$_{me}$		
0530-0600		Guizhou PBS, Guiyang, China[4]	3260$_{do}$	7275$_{do}$		
0530-0600		Radio Romania Int'l, Bucharest	15340$_{af}$	15380$_{af}$	17720$_{af}$	
			17745$_{af}$	17790$_{af}$	21665$_{af}$	
0530-0600		UAE Radio, Dubai, United Arab Emirates	15435$_{as}$	17830$_{as}$	21700$_{as}$	
0530-0600	mtwhfa	Zimbabwe BC Corp, Harare	3396$_{do}$	7283$_{do}$		
0545-0600		Radio Buea, Cameroon[1]	3970$_{do}$			
0555-0600		Voice of Malaysia,Kuala Lumpur	6175$_{as}$	9750$_{as}$	15295$_{as}$	

PROGRAMS

Sundays

0509 BBC: Twenty-Four Hours. Analysis of the main news of the day.
0509 Deutsche Welle: Commentary. See S 0109.
0515 Radio Beijing: Press Clippings. See S 0015.
0517 Deutsche Welle: Feature. See S 0117.
0520 Radio Beijing: Travel Talk. See S 0020.
0528 Radio Beijing: Cooking Show. See S 0028.
0530 BBC: World Business Review. The previous week's news and upcoming events.
0534 Deutsche Welle: German by Radio. See S 0134.
0535 Radio Beijing: Music from China. See S 0035.
0540 BBC: Words Of Faith. Speakers from various faiths discuss scripture and their beliefs.
0545 BBC: Letter From America. Alistair Cooke presents his unique reflections on the USA.

Mondays

0509 BBC: Twenty-Four Hours. See S 0509.
0509 Deutsche Welle: Commentary. See S 0109.
0515 Radio Beijing: China Anthology. See S 1115.
0516 Deutsche Welle: Living in Germany. See M 0116.
0525 Radio Beijing: Music Album. See S 1125.
0530 BBC: Waveguide. Tips on how to hear the BBC better.
0534 Deutsche Welle: Larry's Random Selection. See M 0134.
0540 BBC: Words Of Faith. See S 0540.
0540 Radio Beijing: Listeners' Letterbox. See S 1140.
0545 BBC: Recording Of The Week. See S 0315.

Tuesdays

0509 BBC: Twenty-Four Hours. See S 0509.
0509 Deutsche Welle: European Journal. See M 0209.
0515 Radio Beijing: Current Affairs. See M 1115.
0530 BBC: World Business Report. See M 2305.
0534 Deutsche Welle: Transatlantic Diary. See T 0134.
0540 BBC: Words Of Faith. See S 0540.
0540 Radio Beijing: Learn to Speak Chinese. See M 1140.
0545 BBC: The World Today. See M 1645.

Wednesdays

0509 BBC: Twenty-Four Hours. See S 0509.
0509 Deutsche Welle: European Journal. See M 0209.
0515 Radio Beijing: Current Affairs. See M 1115.
0530 BBC: World Business Report. See M 2305.
0534 Deutsche Welle: Transatlantic Diary. See T 0134.
0540 BBC: Words Of Faith. See S 0540.
0540 Radio Beijing: Listeners' Letterbox. See S 1140.
0545 BBC: The World Today. See M 1645.

Thursdays

0509 BBC: Twenty-Four Hours. See S 0509.
0509 Deutsche Welle: European Journal. See M 0209.
0515 Radio Beijing: Current Affairs. See M 1115.
0530 BBC: World Business Report. See M 2305.
0534 Deutsche Welle: Transatlantic Diary. See T 0134.
0540 BBC: Words Of Faith. See S 0540.
0540 Radio Beijing: Learn to Speak Chinese. See M 1140.
0545 BBC: The World Today. See M 1645.

Fridays

0509 BBC: Twenty-Four Hours. See S 0509.
0509 Deutsche Welle: European Journal. See M 0209.
0515 Radio Beijing: Current Affairs. See M 1115.
0530 BBC: World Business Report. See M 2305.
0540 BBC: Words Of Faith. See S 0540.
0540 Radio Beijing: Culture in China. See H 1140.
0545 BBC: The World Today. See M 1645.

Saturdays

0509 BBC: Twenty-Four Hours. See S 0509.
0509 Deutsche Welle: European Journal. See M 0209.
0515 Radio Beijing: Current Affairs or The Business Show. See F 1115.
0530 BBC: World Business Report. See M 2305.
0534 Deutsche Welle: Through German Eyes. See S 1513.
0540 BBC: Words Of Faith. See S 0540.
0540 Radio Beijing: In the Third World. See F 1140.
0545 BBC: The World Today. See M 1645.

English language announcer Dang Bing of Radio Beijing.

0600 UTC [2:00 AM EDT/11:00 PM PDT]

FREQUENCIES

0600-0610	s	Malawi B'casting Corp., Blantyre	3381$_{do}$		
0600-0620		Vatican Radio, Vatican City	6185$_{eu}$	6248$_{eu}$	
0600-0625		Cameroon Radio-TV, Yaounde	4850$_{do}$		
0600-0625		Voice of Kenya, Nairobi	6075$_{do}$		
0600-0630		Nat'l Radio of Laos, Vientiane	7112$_{as}$		
0600-0630	s	Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
0600-0645	s	Radio Douala, Cameroon	4795$_{do}$		
0600-0650		Deutsche Welle, Koln, Germany	11765$_{af}$	13610$_{af}$	13790$_{af}$
			15185$_{af}$	15205$_{af}$	17875$_{af}$
0600-0700		King of Hope, Lebanon	6280$_{me}$		
0600-0700		Radio 1, Accra, Ghana[1]	4915$_{do}$		
0600-0700	f	Radio 2, Accra, Ghana	3366$_{do}$		
0600-0700		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
0600-0700	sa	Radio E.Africa, Equatorial Guinea	9585$_{af}$		
0600-0700		Radio New Zealand Int'l	17770$_{pa}$		
0600-0700		Radio Havana Cuba	11835$_{am}$		
0600-0700		Radio Luxembourg	15350$_{om}$		
0600-0700		Radio Australia, Melbourne	9640$_{pa}$	11930$_{pa}$	15240$_{as}$
			15320$_{pa}$	17630$_{as}$	17750$_{af}$
			21525$_{na}$	21740$_{na}$	21775pa
0600-0700		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
0600-0700		Radio Pyongyang, North Korea	15180$_{as}$	15230$_{as}$	
0600-0700	sa	Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
0600-0700	smtwha	RTV Malaysia, Radio 4	7295$_{do}$		
0600-0700		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0600-0700		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0600-0700		BBC London, England	3955$_{eu}$	6180$_{na}$	6190$_{as}$
			6195$_{as}$	7120$_{pa}$	7230$_{af}$
			9410$_{af}$	9600$_{af}$	11760$_{eu}$
			11940$_{eu}$	12095$_{af}$	15070$_{af}$
			15310$_{as}$	15400$_{af}$	15420$_{af}$
			15590$_{me}$	17885$_{me}$	21470$_{af}$
0600-0700		Radio Moscow N. American Svc	17720$_{na}$		
0600-0700		Radio Moscow World Service	7310$_{na}$	12055$_{va}$	13705$_{va}$
			15280$_{va}$	15295$_{va}$	15455$_{va}$
			15560$_{va}$	17570$_{va}$	17590$_{va}$
			17600$_{va}$	17610$_{va}$	17675$_{va}$
0600-0700		Radio Korea, Seoul	7275om	11810na	15170na
0600-0700		V. of the Mediterranean, Malta	9765eu		
0600-0700		Christian Science World Service	9455$_{eu}$	9840$_{eu}$	11705$_{na}$
			17555$_{eu}$	17780va	
0600-0700		WYFR Okeechobee, Florida	5985$_{na}$	7355$_{eu}$	13760$_{na}$
			15566$_{eu}$		
0600-0700		VOA Europe	3980eu	5995eu	6040eu
			6060eu	6095eu	6140eu
			7170eu	7325eu	11805eu
0600-0700		WHRI Noblesville, Indiana	7315$_{eu}$	9495$_{sa}$	
0600-0700		HCJB Quito, Ecuador	9745na	15115na	
0600-0700		WWCR Nashville, Tennessee	7520$_{na}$		
0600-0700	smtwhf	WMLK Bethel, Pennsylvania	9465$_{eu}$		
0600-0700		KTBN Salt Lake City, Utah	7510$_{na}$		
0600-0700		R. For Peace Int'l, Costa Rica	7375na	13630$_{na}$	
0600-0700		Voice of America, Washington	6035$_{af}$	6125$_{af}$	9530$_{af}$
			9575$_{af}$	15115$_{af}$	17715af
0600-0700		Voice of Malaysia,Kuala Lumpur	6175$_{as}$	9750$_{as}$	15295$_{as}$
0600-0700		Zimbabwe BC Corp, Harare	3396$_{do}$	7283$_{do}$	
0615-0630	s	Radio Bertoua, Cameroon	4750$_{do}$		
0625-0700		Voice of Kenya, Nairobi	7140$_{do}$		
0630-0635	mtwhf	RTV Congolaise, Brazzaville	7105$_{do}$	9610$_{do}$	
0630-0700		Radio Polonia, Warsaw	6135$_{eu}$	7270$_{eu}$	9675$_{eu}$
			15120$_{eu}$		
0630-0700		Radio Tirana, Albania	7205$_{eu}$	9500$_{eu}$	
0630-0700		BRT Brussels, Belgium	6035eu	11695eu	13675eu
0630-0700		Radio Sofia, Bulgaria	11720eu	15160eu	17825eu
0630-0700		Radio Finland, Helsinki	6120eu	9560eu	11755eu
0630-0700		Swiss Radio Int'l, Bern	15430$_{af}$	17570$_{af}$	21770$_{af}$
0630-0700		Vatican Radio, Vatican City	11710$_{af}$	17730$_{af}$	21650$_{af}$
0635-0700		Trans World Radio, Monte Carlo	9480eu		
0645-0700		Ghana B'casting Corp., Accra	6130$_{af}$		

PROGRAMS

Sundays

0609 Deutsche Welle: Commentary. See S 0109.
0613 Deutsche Welle: Sports Report. See S 0213.
0619 Deutsche Welle: International Talking Point. See S 0419.
0630 BBC: Jazz For The Asking. Digby Fairweather plays listener requests.
0634 Deutsche Welle: People and Places. See S 0434.

Mondays

0609 Deutsche Welle: European Journal. See M 0209.
0630 BBC: Feature. See S 1401.
0634 Deutsche Welle: Africa in the German Press. See M 0434.

Tuesdays

0609 Deutsche Welle: European Journal. See M 0209.
0630 BBC: Rock/Pop Music. Paul Jones delves into R&B, jazz, soul, and rock on "Counterpoint," a series which ends this month.
0634 Deutsche Welle: Africa Report. See T 0434.

Wednesdays

0609 Deutsche Welle: European Journal. See M 0209.
0630 BBC: Meridian. Events in the world of the arts.
0634 Deutsche Welle: Africa Report. See T 0434.

This friendly face comes from Radio Beijing. QSL courtesy of Richard Lane.

Thursdays

0609 Deutsche Welle: European Journal. See M 0209.
0630 BBC: Omnibus. See W 0030.
0634 Deutsche Welle: Africa Report. See T 0434.

Fridays

0609 Deutsche Welle: European Journal. See M 0209.
0630 BBC: Meridian. See W 0630.
0634 Deutsche Welle: Africa Report. See T 0434.

Saturdays

0609 Deutsche Welle: Commentary. See S 0109.
0623 Deutsche Welle: Panorama. See A 0223.
0630 BBC: Meridian. See W 0630.
0634 Deutsche Welle: Man and Environment. See T 0234.

0700 UTC [3:00 AM EDT/12:00 AM PDT]

FREQUENCIES

0700-0710	w	Malawi B'casting Corp., Blantyre	3381$_{do}$	5995$_{do}$	
0700-0710		Radio Bafoussam, Cameroon[1]	4000$_{do}$		
0700-0715		Radio Romania Int'l, Bucharest	11810$_{au}$	11940$_{au}$	15250$_{au}$
			15365$_{au}$	17720$_{au}$	17805$_{au}$
			21665$_{au}$		
0700-0710	mtwhf	Vatican Radio, Vatican City[ml]	6185$_{eu}$	6248$_{eu}$	9645$_{eu}$
			11740$_{eu}$		
0700-0730		Radio New Zealand Int'l	17770$_{pa}$		
0700-0730	s	Radio Riga Int'l, Latvia, USSR	5935$_{eu}$		
0700-0800		Ghana B'casting Corp., Accra	6130$_{af}$		
0700-0800		King of Hope, Lebanon	6280$_{me}$		
0700-0800		Radio 1, Accra, Ghana[1]	4915$_{do}$		
0700-0800	f	Radio 2, Accra, Ghana	3366$_{do}$		
0700-0800		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
0700-0800	sa	Radio E.Africa, Equatorial Guinea	9585$_{af}$		
0700-0800		Radio Havana Cuba	11835$_{am}$		
0700-0800		Radio Luxembourg	15350$_{om}$		
0700-0800		R. for Peace Int'l, Costa Rica	7375$_{na}$	13630$_{na}$	
0700-0800		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
0700-0800		Radio Pyongyang, North Korea	15340$_{as}$	17765$_{as}$	
0700-0800	sa	Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
0700-0800	smtwha	RTV Malaysia, Radio 4	7295$_{do}$		
0700-0800		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0700-0800		Trans World Radio, Monte Carlo	9480eu		
0700-0800		WWCR Nashville, Tennessee	7520am		
0700-0800		KVOH Los Angeles, California	9785		
0700-0800		BBC London, England	3955$_{eu}$	5955$_{na}$	5975$_{af}$
			6190$_{af}$	6195$_{as}$	7120$_{eu}$
			7150$_{af}$	7230$_{eu}$	7325$_{me}$
			9410$_{as}$	9600$_{as}$	9640$_{as}$
			11760$_{eu}$	11940$_{af}$	11955$_{as}$
			12095$_{me}$	15070$_{me}$	15280$_{pa}$
			15310$_{me}$	15360$_{af}$	15400$_{af}$
			15420$_{af}$	15590$_{me}$	17640$_{af}$
			17790$_{me}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
0700-0800		Radio Moscow World Service	15280$_{va}$	17600$_{va}$	17615$_{va}$
			17710$_{va}$	17790$_{va}$	17810$_{na}$
0700-0800		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0700-0800		Voice of Free China, Taiwan	5950$_{na}$		
0700-0800		Voice of Kenya, Nairobi	7140$_{do}$		
0700-0800		Voice of Malaysia,Kuala Lumpur	6175$_{as}$	9750$_{as}$	15295$_{as}$
		BBC London, England			
0700-0800		Christian Science World Service	9455$_{eu}$	9840$_{eu}$	13760$_{pa}$
			17555$_{as}$	17780va	
0700-0800		WYFR Okeechobee, Florida	7355$_{na}$	13780$_{eu}$	15566$_{eu}$
			13695$_{na}$		
0700-0800		Radio Australia, Melbourne	11930$_{va}$	15240$_{va}$	15320$_{va}$
			17630$_{va}$	17750$_{va}$	21525$_{va}$
			21740$_{va}$	21775$_{va}$	
0700-0800		WHRI Noblesville, Indiana	7315$_{eu}$	9495$_{sa}$	
0700-0800		KTBN Salt Lake City, Utah	7510$_{na}$		
0700-0800		HCJB Quito, Ecuador	9610$_{va}$	9745$_{va}$	11840$_{va}$
0700-0800		Zimbabwe BC Corp., Harare	3396$_{do}$	7283$_{do}$	
0705-0800	a	Radio Douala, Cameroon	4795$_{do}$		
0709-0800	mtwhf	Tristan Radio, Tirstan da Cunha	3290$_{do}$		
0730-0800		Radio New Zealand, Wellington	9700as		
0730-0800		Radio Austria, Vienna	6155eu	13730eu	15410me
			21490me		
0730-0800		AWR Foli, Italy	7230eu		
0730-0800		Radio Netherlands, Hilversum	9630$_{au}$	9715$_{au}$	
0730-0800		Swiss Radio Int'l, Bern	3985$_{eu}$	6165$_{eu}$	9535$_{eu}$
0740-0800		Radio Prague Inter-Program	6055$_{eu}$	7345$_{eu}$	9505$_{eu}$
0740-0800		TWR Monte Carlo	9480		

0800 UTC [4:00 AM EDT/1:00 AM PDT]

FREQUENCIES

0800-0810	w	Malawi B'casting Corp., Blantyre	3381$_{do}$		
0800-0810		Radio Bafoussam, Cameroon[1]	4000$_{do}$		
0800-0815	mtwhf	Tristan Radio, Tirstan da Cunha	3290$_{do}$		
0800-0825		Radio Netherlands, Hilversum	9630$_{au}$	9715$_{au}$	
0800-0825		Voice of Malaysia,Kuala Lumpur	6175$_{as}$	9750$_{as}$	15295$_{as}$
0800-0830		Voice of America, Washington	15195$_{va}$	21570$_{va}$	21700$_{va}$
0800-0830		Radio Tirana, Albania	9500$_{as}$	11835$_{as}$	
0800-0830		Voice of America, Washington	11735$_{va}$	15160$_{va}$	15195$_{va}$
			21570$_{va}$		
0800-0830		Radio Australia, Melbourne	9710$_{va}$	15160$_{va}$	15240$_{vs}$
			17630$_{va}$	17750$_{va}$	21525$_{va}$
			21775$_{va}$	25750$_{me}$	
0800-0830		Voice of Islam, Bangladesh	15195$_{as}$	17815$_{as}$	
0800-0850		TWR Monte Carlo	9480		
0800-0900		Radio Finland, Helsinki	17800pa	21550pa	
0800-0900		King of Hope, Lebanon	6280$_{me}$		
0800-0900		HCJB Quito, Ecuador	6205$_{pa}$	9610$_{pa}$	9745$_{pa}$
			11835$_{pa}$	11925$_{pa}$	
0800-0900		KNLS Anchor Point, Alaska	11715$_{as}$		
0800-0900		Radio 1, Accra, Ghana[1]	4915$_{do}$		
0800-0900	f	Radio 2, Accra, Ghana	3366$_{do}$		
0800-0900		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
0800-0900	a	Radio Douala, Cameroon	4795$_{do}$		
0800-0900	sa	Radio E.Africa, Equatorial Guinea	9585$_{af}$		
0800-0900		Radio Korea, Seoul, S. Korea	7550$_{eu}$	13670$_{eu}$	
0800-0900		Radio Luxembourg	15350$_{om}$		
0800-0900		Radio New Zealand Int'l	9700$_{pa}$		
0800-0900		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
0800-0900		Radio Pyongyang, North Korea	15180$_{as}$	15230$_{as}$	
0800-0900	smtwha	RTV Malaysia, Radio 4	7295$_{do}$		
0800-0900		WWCR Nashville, Tennessee	7520am		
0800-0900		Radio Korea, Seoul	7550eu	13670eu	
0800-0900		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0800-0900		SLBS, Freetown, Sierra Leone	3316$_{do}$	5980$_{do}$	
0800-0900		BBC London, England	5975$_{na}$	6180$_{na}$	6190$_{va}$
			6195$_{va}$	7150$_{va}$	7325$_{na}$
			9410$_{eu}$	9640$_{af}$	9740$_{af}$
			11760$_{me}$	11940$_{af}$	11955$_{pa}$
			12095$_{eu}$	15070$_{va}$	15280$_{pa}$
			15310$_{me}$	15360$_{me}$	15420$_{af}$
			15590$_{me}$	17640$_{va}$	17705$_{va}$
			17790$_{af}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
0800-0900		Christian Science World Service	9455$_{va}$	11705va	13760va
			17555va	15610va	
0800-0900		WHRI Noblesville, Indiana	7315$_{eu}$	9495$_{sa}$	
0800-0900		VOA Europe, Washington	11740$_{eu}$	15160$_{eu}$	15195$_{eu}$
			21570$_{eu}$	21615$_{eu}$	
0800-0900		Voice of Indonesia, Jakarta	11752$_{as}$	11785$_{as}$	
0800-0900		Voice of Kenya, Nairobi	7140$_{do}$		
0800-0900		Voice of Nigeria, Lagos	7255$_{af}$		
0800-0900		Zimbabwe BC Corp., Harare	3396$_{do}$	7283$_{do}$	
0830-0855		Radio Netherlands, Hilversum	9770$_{au}$		
0830-0900		Radio Netherlands, Hilversum	17575$_{as}$	21485$_{as}$	
0830-0900		Swiss Radio Int'l, Bern	9560$_{as}$	13685$_{as}$	17670$_{as}$
			21695$_{as}$		
0830-0900		Radio Australia, Melbourne	9580va	9710va	15160va
			15240va	15320va	17630va
			21775va	25750	
0830-0900		Voice of Amercia, Washington	11735$_{va}$	15160$_{va}$	15195$_{va}$
			21570$_{va}$	21700$_{va}$	
0840-0850	mtwhfa	Voice of Greece, Athens	15650$_{au}$	17525$_{au}$	
0840-0900		Radio Prague Inter-Program	6055$_{eu}$	7345$_{eu}$	9505$_{eu}$
0850-0900	s	TWR Monte Carlo	9480eu		

0900 UTC [5:00 AM EDT/2:00 AM PDT]

FREQUENCIES

0900-0905		Radio 1, Accra, Ghana[1]	4915$_{do}$		
0900-0905	f	Radio 2, Accra, Ghana	3366$_{do}$		
0900-0910		Malawi B'casting Corp., Blantyre	5995$_{do}$		
0900-0915		Radio Voice of Lebanon, Beirut	6549.5$_{me}$		
0900-0925		Radio Netherlands, Hilversum	17575$_{as}$	21485$_{as}$	
0900-0930		Radio Australia, Melbourne	9580$_{na}$	13705$_{va}$	15160$_{va}$
			15240$_{va}$	17630$_{va}$	17715$_{va}$
			17750$_{va}$	21775$_{va}$	25750$_{me}$
0900-0935	s	Trans World Radio, Monte Carlo	9480eu		
0900-0950		Deutsche Welle, Koln, Germany	9565$_{af}$	15410$_{af}$	21600$_{af}$
0900-0950		Deutsche Welle, Koln, Germany	6160as	11915as	17780as
			17820as	21465as	
			21650as	21680as	
0900-1000		Christian Science World Svc	9455va	11705va	13760va
			15610va	17555va	
0900-1000	s	BBS, Thimphu, Bhutan	5023$_{do}$		
0900-1000		Radio New Zealand, Wellington	9700pa		
0900-1000		WWCR Nashville, Tennessee	7520am		
0900-1000		TWR Monte Carlo	9480		
0900-1000		BBC London, England	5975$_{na}$	6180$_{na}$	6190$_{va}$
			6195$_{va}$	7150$_{va}$	7325$_{na}$
			9410$_{eu}$	9640$_{af}$	9740$_{af}$
			11760$_{me}$	11940$_{af}$	11955$_{pa}$
			12095$_{eu}$	15070$_{va}$	15280$_{pa}$
			15310$_{me}$	15360$_{me}$	15420$_{af}$
			15590$_{me}$	17640$_{va}$	17705$_{va}$
			17790$_{af}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
0900-1000		HCJB Quito, Ecuador	9745va		
0900-1000		FEBC Radio Int'l, Philippines	9800$_{as}$	11665$_{as}$	
0900-1000		King of Hope, Lebanon	6280$_{me}$		
0900-1000		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
0900-1000		Radio Beijing, China	11755$_{au}$	15440$_{au}$	17710$_{au}$
0900-1000	sa	Radio E.Africa, Equatorial Guinea	9585$_{af}$		
0900-1000		Radio Japan, Tokyo	15270$_{pa}$	17890$_{pa}$	
0900-1000		Radio Luxembourg	15350om		
0900-1000		Radio Nigeria, Lagos	3326$_{do}$	4990$_{do}$	
0900-1000		Radio Tanzania, Dar es Salaam	5985$_{af}$	9685$_{af}$	11765$_{af}$
0900-1000		RTV Malaysia, Radio 4	7295$_{do}$		
0900-1000		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
0900-1000		SLBS, Freetown, Sierra Leone	3316$_{do}$		
0900-1000		VOA Europe, Washington	11740$_{eu}$	15160$_{eu}$	15195$_{eu}$
			21570eu	21615eu	
0900-1000		Voice of Kenya, Nairobi	7140$_{do}$		
0900-1000		Voice of Nigeria, Lagos	7255$_{af}$		
0900-1000		Zimbabwe BC Corp., Harare	3396$_{do}$	7283$_{do}$	
0905-1000		Cameroon Radio-TV, Yaounde	4850$_{do}$		
0905-1000	sa	Radio 1, Accra, Ghana[1]	4915$_{do}$		
0905-1000	sa	Radio 2, Accra, Ghana	3366$_{do}$		
0905-1000	mtwhf	Radio 2 (Schools Program), Ghana	7295$_{do}$		
0910-0940	smwha	Ulaanbaatar Radio, Mongolia	11850$_{pa}$	12015$_{pa}$	
0920-1000		BFBS (British Forces), London	15245$_{me}$	17830$_{me}$	21745$_{me}$
0930-0940		RTV Togo, Lome	7265$_{do}$		
0930-1000		Radio Australia, Melbourne	9580$_{na}$	15240$_{va}$	17630$_{va}$
			17715$_{va}$	17750$_{va}$	21775$_{va}$
			21825$_{va}$	25750$_{me}$	
0930-1000		Radio Afghanistan, Kabul	4940$_{as}$	9635$_{as}$	17655$_{as}$
			21600$_{as}$		
0940-1000		Radio Prague Inter-Program	6055$_{eu}$	7345$_{eu}$	9505$_{eu}$

1000 UTC [6:00 AM EDT/3:00 AM PDT]

FREQUENCIES

1000-1015	mtwhf	Radio Budapest, Hungary	6110$_{as}$	9585$_{as}$	9835$_{as}$
			11925$_{as}$	15160$_{as}$	15220$_{as}$
1000-1025	mtwhf	BRT, Brussels, Belgium	6035$_{eu}$	13675$_{eu}$	21810$_{af}$
1000-1030		Kol Israel, Jerusalem	11588na	15650na	17575na
			17590eu	21710na	21790na
1000-1030		Radio Tanzania, Dar es Salaam	5985$_{af}$	9685$_{af}$	11765$_{af}$
1000-1030		Radio Australia, Melbourne	6080$_{va}$	9580$_{na}$	9760$_{va}$
			15240$_{va}$	17715$_{va}$	21775$_{va}$
1000-1030		Radio Afghanistan, Kabul	4940$_{as}$	9635$_{as}$	17655$_{as}$
			21600$_{as}$		
1000-1030		Voice of Vietnam, Hanoi	9755$_{as}$	12020$_{as}$	
1000-1100		All India Radio, Delhi	15050$_{as}$	15335$_{as}$	17387$_{as}$
			17865$_{as}$	21735$_{as}$	
1000-1100		Cameroon Radio-TV, Yaounde	4850$_{do}$		
1000-1100	sa	Radio 1, Accra, Ghana[1]	4915$_{do}$		
1000-1100	sa	Radio 2, Accra, Ghana	3366$_{do}$		
1000-1100	mtwhf	Radio 2 (Schools Program), Ghana	7295$_{do}$		
1000-1100		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
1000-1100		Radio Beijing, China	11755$_{au}$	15440$_{au}$	17710$_{au}$
1000-1100	sa	Radio E.Africa, Equatorial Guinea	9585$_{af}$		
1000-1100		Radio Luxembourg	15350om		
1000-1100		FEBC Mainila, Phillipines	9800as	11665as	
1000-1100		WWCR Nashville, Tennessee	7520na		
1000-1100		HCJB Quito, Ecuador	9745pa	11925pa	
1000-1100		Radio New Zealand, Wellington	9700pa		
1000-1100		BBC London, England	5975$_{na}$	6180$_{na}$	6190$_{va}$
			6195$_{va}$	7150$_{va}$	7325$_{na}$
			9410$_{eu}$	9640$_{af}$	9740$_{af}$
			11760$_{me}$	11940$_{af}$	11955$_{pa}$
			12095$_{eu}$	15070$_{va}$	15280$_{pa}$
			15310$_{me}$	15360$_{me}$	15420$_{af}$
			15590$_{me}$	17640$_{va}$	17705$_{va}$
			17790$_{af}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
1000-1100		Christian Science World Svc	9455$_{eu}$	9495$_{eu}$	13625pa
			15610va	17555va	
1000-1100		WYFR Okeechobee, Florida	5985$_{am}$		
1000-1100		KTBN Salt Lake City Utah	7510$_{am}$		
1000-1100		TWR Costa Rica	9725$_{ca}$		
1000-1100		Radio Nigeria, Lagos	4990$_{do}$	7285$_{do}$	
1000-1100	mtwh	RTV Malaysia, Radio 4	7295$_{do}$		
1000-1100		SBC Radio 1, Singapore	5010$_{do}$	5052$_{do}$	11940$_{do}$
1000-1100		SLBS, Freetown, Sierra Leone	3316$_{do}$		
1000-1100	s	Tristan Radio, Tirstan da Cunha	3290$_{do}$		
1000-1100		Voice of America, Washington	5985$_{as}$	11720$_{as}$	11740$_{va}$
			15160$_{va}$	15195$_{va}$	15425$_{as}$
			21570$_{va}$	21615$_{va}$	
1000-1100		Voice of America, Washington	9590$_{ca}$	11915$_{ca}$	15120ca
1000-1100		Voice of Kenya, Nairobi	7140$_{do}$		
1000-1100		Voice of Nigeria, Lagos	7255$_{af}$		
1000-1100		Zimbabwe BC Corp., Harare	3396$_{do}$	7283$_{do}$	
1000-1015	mtwhf	Radio Budapest, Hungary	6110$_{as}$	9585$_{as}$	9835$_{as}$
			11925$_{as}$	15160$_{as}$	15220$_{as}$
1030-1040	mtwhf	Malawi B'casting Corp., Blantyre	5995$_{do}$		
1030-1045	mtwhf	Radio Budapest, Hungary	6110$_{as}$	9585$_{as}$	9835$_{as}$
			11925$_{as}$	15160$_{as}$	15220$_{as}$
1030-1100		Radio Australia, Melbourne	6080$_{va}$	9580$_{na}$	9760$_{va}$
			11715$_{va}$	21775$_{va}$	
1030-1100		Radio Netherlands, Hilversum	6020$_{am}$	11890$_{am}$	
1030-1100	sa	Radio Tanzania, Dar es Salaam	5985$_{af}$	9685$_{af}$	11765$_{af}$
1030-1100		Sri Lanka B'casting Corp.	11835$_{as}$	15120$_{as}$	17850$_{as}$
1030-1100		Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
1030-1100		Radio Austria, Vienna	15450as	21490as	
1030-1100		AWR Foli, Italy	7230eu		
1030-1100		Radio Korea, Seoul	11715na		
1030-1100		UAE Radio, Dubai, United Arab Emirates	15435$_{eu}$	21605$_{eu}$	
1040-1050	mtwhfa	Voice of Greece, Athens	15650$_{as}$	17535$_{as}$	
1040-1100		Radio Prague Inter-Program	6055$_{eu}$	7345$_{eu}$	9505$_{eu}$
1045-1100	s	Radio Budapest, Hungary	7220$_{eu}$	9585$_{eu}$	9835$_{eu}$
			11910$_{eu}$	15160$_{eu}$	15220$_{eu}$

1100 UTC [7:00 AM EDT/4:00 AM PDT]

FREQUENCIES

1100-1110	sa	Malawi B'casting Corp., Blantyre	5995$_{do}$		
1100-1110	mtwhf	Radio 2 (Schools Program), Ghana	7295$_{do}$		
1100-1120		Radio Pakistan, Islamabad	17565$_{eu}$	21520$_{eu}$	
1100-1125		Radio Netherlands, Hilversum	6020$_{am}$	11890$_{am}$	
1100-1130		Radio Mozambique, Maputo	9525$_{af}$	11818$_{af}$	11835$_{af}$
1100-1130		Sri Lanka B'casting Corp.	11835$_{as}$	15120$_{as}$	17850$_{as}$
1100-1130		Swiss Radio Int'l, Bern	13635$_{as}$	15570$_{as}$	17830$_{as}$
			21770$_{as}$		
1100-1130		Voice of Vietnam, Hanoi	7416$_{as}$	9732$_{as}$	
1100-1150		Deutsche Welle, Koln, Germany	11890$_{af}$	15410$_{af}$	17765$_{af}$
			17800$_{af}$	17860$_{af}$	21600af
1100-1200		Radio Australia, Melbourne	6080$_{va}$	7240$_{va}$	9580$_{na}$
			9710$_{va}$	9760$_{va}$	11930$_{va}$
			15160$_{va}$	17715$_{va}$	21775$_{va}$
			21825$_{va}$		
1100-1200		Radio 1, Accra, Ghana[1]	4915$_{do}$		
1100-1200	sa	Radio 2, Accra, Ghana	3366$_{do}$		
1100-1200		TWR Bonaire	11815$_{am}$	15345$_{am}$	
1100-1200		Radio Japan, Tokyo	6120$_{na}$	11815$_{sa}$	11840$_{na}$
			12070$_{pa}$		
1100-1200		WYFR Okeechobee, Florida	5950$_{na}$	7355$_{na}$	11900$_{ca}$
1100-1200		KTBN Salt Lake City, Utah	7510$_{na}$		
1100-1200		Radio Beijing, China	15135$_{eu}$		
1100-1200		Christian Science World Svc	9455$_{eu}$	9495$_{eu}$	13625$_{pa}$
			17555pa	15610pa	
1100-1200		HCJB Quito, Ecuador	11740$_{am}$		
1100-1200		BBC London, England	5975$_{na}$	6180$_{na}$	6190$_{va}$
			6195$_{va}$	7150$_{va}$	7325$_{na}$
			9410$_{eu}$	9640$_{af}$	9740$_{af}$
			11760$_{me}$	11940$_{af}$	11955$_{pa}$
			12095$_{eu}$	15070$_{va}$	15220$_{pa}$
			15280$_{me}$	15310$_{me}$	15420$_{af}$
			15590$_{me}$	17640$_{va}$	17705$_{va}$
			17790$_{af}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
1100-1200		Radio 2, Lusaka, Zambia	6165$_{do}$	7235$_{do}$	
1100-1200	mtwhf	Radio Douala, Cameroon	4795$_{do}$		
1100-1200		Radio Japan, Tokyo	6120$_{na}$	11815$_{na}$	11840$_{na}$
1100-1200		WYFR Okeechobee, Florida	5950$_{na}$	11580$_{na}$	
1100-1200		Radio Moscow World Service	6000$_{va}$	9705$_{va}$	9780$_{va}$
			9875$_{va}$	11920$_{va}$	15175$_{va}$
			15280$_{va}$	15345$_{va}$	15435$_{va}$
			15465$_{va}$	15520$_{va}$	17565$_{va}$
			17605$_{va}$	17780$_{va}$	17790$_{va}$
			17810$_{va}$	17840$_{va}$	17870$_{va}$
			17880$_{va}$	21785$_{va}$	
1100-1200		Trans World Radio, Bonaire	11815$_{na}$	15345$_{na}$	
1100-1200		Radio Korea, Seoul	9650na	15575na	
1100-1200		Radio New Zealand, Wellington	9700pa		
1100-1200		HCJB Quito, Ecuador	11740$_{na}$		
1100-1200		Christian Science World Svc	9455$_{eu}$	9495$_{eu}$	13625$_{pa}$
			15610eu	17555pa	
1100-1200	sa	Radio E.Africa,Equatorial Guinea	9585$_{af}$		
1100-1200		Radio Korea, Seoul,South Korea	15575$_{af}$		
1100-1200		Radio Luxembourg	15350om		
1100-1200		Radio Nigeria, Lagos	4990$_{do}$	7285$_{do}$	
1100-1200		Radio Pyongyang, North Korea	6576$_{na}$	9977$_{na}$	11335$_{na}$
1100-1200		Radio RSA, South Africa	9555$_{af}$	11805$_{af}$	11900$_{af}$
			17835$_{af}$		
1100-1200	sa	Radio Tanzania, Dar es Salaam	5985$_{af}$	9685$_{af}$	11765$_{af}$
1100-1200		Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
1100-1200		RTV Malaysia, Radio 4	7295$_{do}$		
1100-1200		SBC Radio 1, Singapore	5010$_{do}$	5052$_{do}$	11940$_{do}$
1100-1200		SLBS, Freetown, Sierra Leone	3316$_{do}$		
1100-1200	s	Tristan Radio, Tirstan da Cunha	3290$_{do}$		
1100-1200		Voice of America, Washington	5985$_{as}$	6110$_{as}$	9760$_{as}$
			11720$_{as}$	15155$_{as}$	15425$_{as}$
1100-1200		Voice of America, Washington	9590$_{ca}$	11915$_{ca}$	15120ca
1100-1200		Voice of Asia, Kaohsiung,Taiwan	7445$_{as}$		
1100-1200		Voice of Kenya, Nairobi	7140$_{do}$		
1100-1200		Voice of Nigeria, Lagos	7255$_{af}$		
1100-1200	war	Voice of Peace, Baghdad, Iraq	11860$_{me}$	21675$_{me}$	
1100-1200		Zimbabwe B'casting Corp.,Harare	3396$_{do}$	7283$_{do}$	
1110-1115	mtwhf	Radio Botswana, Gaborone	5955$_{af}$	7255$_{af}$	
1115-1145		Voice of Radio Nepal,Kathmandu	5005$_{as}$	7165$_{as}$	
1120-1140		Hunan PBS, Changs ha, China[4]	4990$_{do}$		
1125-1130	sa	Radio Botswana, Gaborone	5955$_{af}$	7255$_{af}$	
1130-1140		Radio Lesotho, Maseru	4800$_{do}$		
1130-1145	mtwhf	Vatican Radio, Vatican City[ml]	6248$_{eu}$	9645$_{eu}$	11740$_{eu}$
			15210$_{eu}$		
1130-1145	a	Radio Budapest, Hungary	7220$_{eu}$	9585$_{eu}$	9835$_{eu}$
			11910$_{eu}$	15160$_{eu}$	15220$_{eu}$
1130-1145		RTV Malaysia-Sarawak, Red Network	5950$_{do}$	7160$_{do}$	
1130-1200		Radio Sweden, Stockholm	11960as	17740as	21570pa
1130-1200		Radio Austria Int'l, Vienna	6155$_{eu}$	13730$_{eu}$	15430$_{as}$
			21490$_{na}$		
1130-1200	mtwhf	Radio Finland, Helsinki	15400na	21550na	
1130-1200		Radio Netherlands, Hilversum	5955$_{eu}$	9715$_{eu}$	17575$_{eu}$
			21480$_{eu}$	21520$_{eu}$	
1130-1200		Radio Thailand, Bangkok	4830$_{as}$	9655$_{as}$	11905$_{as}$
1130-1200		Radio Tirana, Albania	9480$_{as}$	11835$_{as}$	
1130-1200		Voice of America, Washington	11735$_{me}$	15160$_{me}$	15225$_{me}$
			21550$_{me}$	21705$_{me}$	
1130-1200		Voice of the Islamic Republic	9525$_{va}$	9685$_{va}$	9705$_{va}$
		of Iran, Tehran	11745$_{va}$	11790$_{va}$	
1140-1200		Radio Prague Inter-Program	6055$_{eu}$	7345$_{eu}$	9505$_{eu}$
1145-1200		Radiodiffusion Nationale de la	6140$_{af}$		
		Republique du Burundi, Bujumbura			

English language

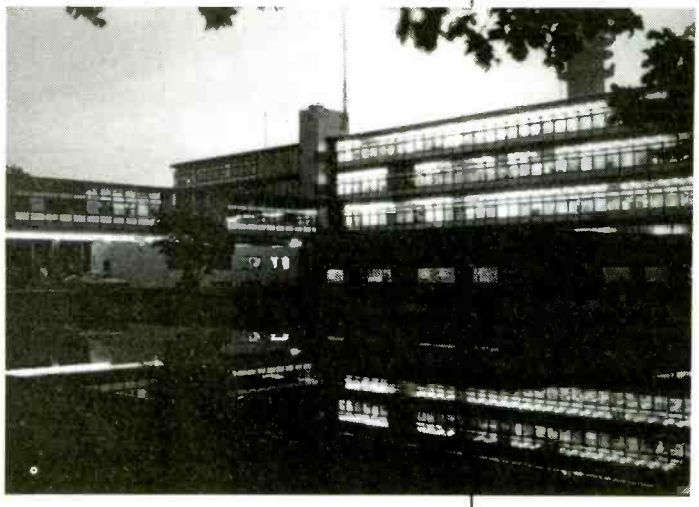
shortwave guide

1100 UTC [7:00 AM EDT/4:00 AM PDT]

PROGRAMS

Sundays

1109 Deutsche Welle: Arts on the Air. Reports and interviews on cultural events and developments.
1115 BBC: Short Story (except 2nd: "Seeing Stars"). Drama written by BBC listeners.
1115 Radio Beijing: China Anthology. Episodes from China's past, with profiles of historical figures.
1125 Radio Beijing: Music Album. A combination of traditional and Western musical selections.
1130 BBC: The Ken Bruce Show. See S 0030.
1130 Radio Netherlands: Happy Station. Tom Meyer's family entertainment program with music and letters.
1134 Deutsche Welle: German by Radio. See S 0134.
1140 Radio Beijing: Listeners' Letterbox. Listener letters and information about China.



The Radio Netherlands headquarters are featured in this QSL from Richard Lane.

Mondays

1109 Deutsche Welle: Newsline Cologne. A current affairs program with worldwide reports and a German press review.
1115 BBC: Health Matters. Developments in the world of medical science and advice on keeping fit.
1115 Radio Beijing: Current Affairs. An in-depth look at events and happenings in China.
1130 BBC: Composer Of The Month. See M 0230.
1134 Deutsche Welle: Hello Africa. Musical requests and greetings to friends.
1137 Radio Netherlands: Newsline. See S 0037.
1140 Radio Beijing: Learn to Speak Chinese. Chinese language lessons for English speakers.
1152 Radio Netherlands: The Research File. The latest developments in science and technology.

Tuesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1115 BBC: Waveguide. See M 0530.
1115 Radio Beijing: Current Affairs. See M 1115.
1125 BBC: Book Choice. A short review of a newly released book.
1130 BBC: Megamix. Music, sports, fashion, health, travel, news, and opinion for young people.
1134 Deutsche Welle: Hello Africa. See M 1134.
1137 Radio Netherlands: Newsline. See S 0037.
1152 Radio Netherlands: Images. An arts magazine, featuring film, theatre, opera, books, and music.

Wednesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1115 BBC: Country Style. See W 0145.
1115 Radio Beijing: Current Affairs. See M 1115.
1130 BBC: Meridian. See W 0630.
1134 Deutsche Welle: Hello Africa. See M 1134.
1137 Radio Netherlands: Newsline. See S 0037.
1140 Radio Beijing: Learn to Speak Chinese. See M 1140.
1152 Radio Netherlands: Feature. Topical programming on various subjects (except May 29th: Democracy in Africa, a symposium on the future of the continent; June: African Elephant, the plight of the endangered animal).

Thursdays

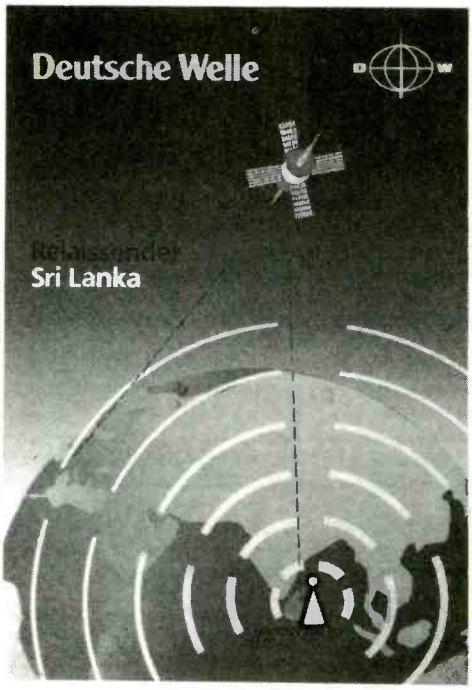
1109 Deutsche Welle: Newsline Cologne. See M 1109.
1115 BBC: From Our Own Correspondent. See S 0330.
1115 Radio Beijing: Current Affairs. See M 1115.
1130 BBC: Drama. This month, hear "And The Band Played On," five plays based on a piece of music.
1134 Deutsche Welle: Hello Africa. See M 1134.
1137 Radio Netherlands: Newsline. See S 0037.
1140 Radio Beijing: Culture in China. The rich cultural heritage of China, as manifested in literature and art.
1152 Radio Netherlands: Media Network. Jonathan Marks surveys communications developments worldwide.

Fridays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1115 BBC: Global Concerns. See F 0145.
1115 Radio Beijing: Current Affairs or The Business Show. An in-depth look at events and happenings in China, or news on Chinese trade and industry.
1130 BBC: Meridian. See W 0630.
1134 Deutsche Welle: Hello Africa. See M 1134.
1137 Radio Netherlands: Newsline. See S 0037.
1140 Radio Beijing: In the Third World. Reports and music from developing nations.
1152 Radio Netherlands: Sounds Interesting. The sights and sounds of Holland, along with listener questions and opinion.

Saturdays

1109 Deutsche Welle: Africa This Week. A review of trends and events on the African continent.
1115 BBC: Worldbrief. See F 2315.
1115 Radio Beijing: Press Clippings. See S 0015.
1120 Radio Beijing: Travel Talk. See S 0020.
1128 Radio Beijing: Cooking Show. See S 0028.
1130 BBC: Meridian. See W 0630.
1134 Deutsche Welle: Mailbag Africa. Listeners' questions, music requests, and the club corner.
1135 Radio Beijing: Music from China. See S 0035.
1137 Radio Netherlands: Newsline. See S 0037.
1152 Radio Netherlands: Asiascan. A live magazine show with interviews with newsmakers, press reviews, monthly quizzes and listener opinion.



Deutsche Welle's Sri Lanka relay was heard by Paul Garland of El Paso, Texas.

1200 UTC [8:00 AM EDT/5:00 AM PDT]

FREQUENCIES

1200-1210		Radio New Zealand, Wellington	9700pa		
1200-1210	w	Malawi B'casting Corp., Blantyre	3381do	5995do	
1200-1215		Voice of the People of Cambodia, Phnom-Penh	9695as	11938as	
1200-1225	sa	Radio 2, Accra, Ghana	3366do		
1200-1225		Radio Netherlands, Hilversum	5955eu	9715eu	17575eu
			21480eu	21520eu	
1200-1225		Voice of the Islamic Republic of Iran, Tehran	9525va	9685va	9705va
			11745va	11790va	
1200-1230	as	Radio Norway, Oslo	17820me	21695as	
1200-1230		Radio Tashkent, Uzbekistan	9540as	9600as	15420as
1200-1230		Radio Mogadishu, Somalia	6095af		
1200-1230		Radio Romania Int'l, Bucharest	15365as	15380as	17720as
1200-1230		Radio Thailand, Bangkok	4830as	9655as	11905as
1200-1230	s	Radio Zambia Int'l, Lusaka[1]	9505af	11880af	17895af
1200-1230	smwha	Ulaanbaatar Radio, Mongolia	11850as	12015as	
1200-1230	mtwhf	Vatican Radio, Vatican City	17865as	21515as	
1200-1230		Voice of America, Washington	6110as	9760as	11715as
			15155as	15425as	
1200-1300		Radio 1, Accra, Ghana[1]	4915do		
1200-1300		Radio Beijing, China	15110am	17715am	
1200-1300		Radio Beijing, China	8425as	11660as	
1200-1300	mtwhf	Radio Douala, Cameroon	4795do		
1200-1300	sa	Radio E. Africa, Equatorial Guinea	9585af		
1200-1300	mtwhf	Radio Canada Int'l, Montreal	9635am	11855am	17820am
1200-1300		Radio Jordan, Amman	13655me		
1200-1300		WYFR Okeechobee, Florida	5950am	6015am	11580am
			17750am		
1200-1300		Radio Luxembourg	15350om		
1200-1300		Radio Nigeria, Lagos	4990do	7285do	
1200-1300	sa	Radio Tanzania, Dar es Salaam	5985af	9684af	11765af
1200-1300		WWCR Nashville, Tennessee	15690na		
1200-1300		Radio Canada Int'l, Montreal	9635am	11855am	17820am
1200-1300		ABC Perth	9610		
1200-1300		BBC London, England	3955eu	5955na	5975af
			6190af	6195as	7120eu
			7150af	7230eu	7325me
			9410as	9600as	9740as
			11760eu	11940af	11955as
			12095me	15070me	15220pa
			15310me	15360af	15400af
			15420af	15590me	17640af
			17790me	17830af	17885af
			21470af	21660af	21715af
1200-1300		TWR Bonaire	11815am	15345am	
1200-1300		KTBN Salt Lake City, Utah	7510am		
1200-1300		Christian Science World Service	9475am	9495am	13625am
			13760am	15610pa	
1200-1300		Radio Korea, Seoul, S. Korea	9750na		
1200-1300		HCJB Quito, Ecuador	11740am	15115am	17890am
1200-1300		Radio Moscow World Service	6000	7305	9705
			9875	11920	13705
			15280	15345	15465
			15520	15550	17565
			17665	17780	17790
			17810	17870	17880
			21680	21725	21785
1200-1300		RTV Malaysia, Radio 4	7295do		
1200-1300		SBC Radio 1, Singapore	5010do	5052do	11940do
1200-1300		SLBS, Freetown, Sierra Leone	3316do	5980do	
1200-1300		Voice of Kenya, Nairobi	7140do		
1200-1300		Voice of Nigeria, Lagos	7255af		
1200-1300	war	Voice of Peace, Baghdad, Iraq	11860me	21675me	
1215-1230		Radio Bayrak, Cyprus	6150va		
1215-1300		Radio Korea, Seoul	9750am		
1215-1300		Radio Cairo, Egypt	17595as		
1226-1300		Radio 2, Accra, Ghana	7295do		
1230-1255	S	BRT, Brussels, Belgium	21810na		
1230-1300		Voice of Turkey, Ankara	9675eu		
1230-1255	mtwhf	Radio Finland, Helsinki	15400am	21550am	
1230-1300		Radio Bangladesh, Dhaka	15647as	17750as	
1230-1300		Radio Sweden, Stockholm	11715as	17740as	21570as
1230-1300		Sri Lanka B'casting Corp.	6075as	9720as	
1230-1300		Radio France Int'l, Paris	9805eu	11670eu	15155eu
			15195eu	21635na	21645na
1230-1300	mtwhf	Tristan Radio, Tristan da Cunha	3290do		
1230-1300		Voice of America, Washington	6110as	9760as	11715as
			15155as	15425as	
1230-1300		Voice of Vietnam, Hanoi	9840as	12020as	15010as
1235-1245		Voice of Greece, Athens	15550am	15650am	17525am
1240-1300		Radio Prague Inter-Program	6055eu	7345eu	9505eu

PROGRAMS

Sundays

1200 Radio Norway Int'l: Norway Today. See S 0100.
1201 BBC: Play Of The Week. See S 0101.
1215 Radio Beijing: China Anthology. See S 1115.
1225 Radio Beijing: Music Album. See S 1125.
1240 Radio Beijing: Listeners' Letterbox. See S 1140.

Mondays

1215 BBC: Quiz. Robert Robinson returns with the general-knowledge game show "Brain Of Britain" (through August 12th).
1215 Radio Beijing: Current Affairs. See M 1115.
1240 Radio Beijing: Learn to Speak Chinese. See M 1140.
1245 BBC: Sports Roundup. News from the world of sports.

Tuesdays

1215 BBC: Multitrack 1: Top 20. See M 2330.
1215 Radio Beijing: Current Affairs. See M 1115.
1240 Radio Beijing: Listeners' Letterbox. See S 1140.
1240 Radio Beijing: Listeners' Letterbox. See S 1140.
1245 BBC: Sports Roundup. See M 1245.

Wednesdays

1215 BBC: New Ideas. See M 1615.

Olav Grimdalen of Radio Norway International's frequency management office.

1215 Radio Beijing: Current Affairs. See M 1115.
1235 BBC: Talks. See M 1635.
1240 Radio Beijing: Learn to Speak Chinese. See M 1140.
1245 BBC: Sports Roundup. See M 1245.

Thursdays

1215 BBC: Multitrack 2. See W 2330.
1215 Radio Beijing: Current Affairs. See M 1115.
1240 Radio Beijing: Culture in China. See H 1140.
1245 BBC: Sports Roundup. See M 1245.

Fridays

1215 BBC: Feature. Topical programming on various subjects.
1215 Radio Beijing: Current Affairs or The Business Show. See F 1115.
1240 Radio Beijing: In the Third World. See F 1140.
1245 BBC: Sports Roundup. See M 1245.

Saturdays

1200 Radio Norway Int'l: Norway Today. See S 0100.
1215 BBC: Multitrack 3. See F 2330.
1215 Radio Beijing: Press Clippings. See S 0015.
1220 Radio Beijing: Travel Talk. See S 0020.
1228 Radio Beijing: Cooking Show. See S 0028.
1235 Radio Beijing: Music from China. See S 0035.
1245 BBC: Sports Roundup. See M 1245.

English language

shortwave guide

1300 UTC [9:00 AM EDT/6:00 AM PDT]

FREQUENCIES

1300-1315		Radio Korea, Seoul, S. Korea	9750$_{na}$		
1300-1325		Voice of Kenya, Nairobi	7140$_{do}$		
1300-1330	as	Radio Finland, Helsinki	15400na	21550na	
1300-1330	as	Radio Norway, Oslo	9590eu	11860eu	
1300-1330		TWR Bonaire	11815am	15345am	
1300-1330		Radio Sweden, Stockholm	11960as	17740as	21570as
1300-1330		Radio Yugoslavia, Belgrade	21715$_{am}$		
1300-1330		Radio Cairo, Egypt	17595$_{as}$		
1300-1330		Radio Beijing, China	11600$_{as}$	11660$_{as}$	
1300-1330	mtwhf	Radio Douala, Cameroon	4795$_{do}$		
1300-1330		Voice of America, Washington	6110$_{as}$	9760$_{as}$	11715$_{as}$
			15155$_{as}$	15245$_{as}$	
1300-1400		FEBC Radio Int'l, Philippines	11850$_{as}$		
1300-1400		Radio 1, Accra, Ghana[1]	4915$_{do}$		
1300-1400		Radio 2, Accra, Ghana	7295$_{do}$		
1300-1400	sa	Radio E. Africa, Equatorial Guinea	9585$_{af}$		
1300-1400		Radio Jordan, Amman	13655??		
1300-1400		BBC London, England	3955$_{eu}$	5955$_{na}$	5975$_{af}$
			6190$_{af}$	6195$_{as}$	7120$_{eu}$
			7150$_{af}$	7230$_{eu}$	7325$_{me}$
			9515$_{as}$	9600$_{as}$	9740$_{as}$
			11775$_{eu}$	11940$_{af}$	11955$_{as}$
			12095$_{me}$	15070$_{me}$	15220$_{pa}$
			15310$_{me}$	15360$_{af}$	15400$_{af}$
			15420$_{af}$	15590$_{me}$	17640$_{af}$
			17790$_{me}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
1300-1400		Radio Moscow World Service	6000$_{va}$	9705$_{va}$	9780$_{va}$
			9875$_{va}$	11920$_{va}$	15175$_{va}$
			15280$_{va}$	15345$_{va}$	15435$_{va}$
			15465$_{va}$	15520$_{va}$	17565$_{va}$
			17605$_{va}$	17780$_{va}$	17790$_{va}$
			17810$_{va}$	17840$_{va}$	17870$_{va}$
			17880$_{va}$	21785$_{va}$	
1300-1400		Radio Luxembourg	15350om		
1300-1400		Radio Nigeria, Lagos	4990$_{do}$	7285$_{do}$	
1300-1400	s	Radio Canada Int'l, Montreal	11955am	17820am	
1300-1400		FEBC Manila	11685pa		
1300-1400		Radio Pyongyang, North Korea	9325$_{eu}$	9345$_{eu}$	9640$_{as}$
			13650$_{as}$	15230$_{as}$	
1300-1400		Radio Romania Int'l, Bucharest	11940$_{eu}$	15365$_{eu}$	17720$_{eu}$
			21665$_{eu}$		
1300-1400	sa	Radio Tanzania, Dar es Salaam	5985$_{af}$	9684$_{af}$	11765$_{af}$
1300-1400		ABC Perth	9610		
1300-1400		Christian Science World Svc	9475pa	9495pa	13625pa
			13760pa	15610pa	
1300-1400		HCJB Quito, Ecuador	11740	15115	17890
1300-1400		Radio Luxembourg	15350		
1300-1400		WHRI Noblesville, Indiana	9465	11790	
1300-1400		WWCR Nashville, TN	15690		
1300-1400		WYFR Okeechobee, Florida	6015am	11580am	13695eu
			17750af		
1300-1400		RTV Malaysia, Radio 4	7295$_{do}$		
1300-1400		SBC Radio 1, Singapore	5010$_{do}$	5052$_{do}$	11940$_{do}$
1300-1400		SLBS, Freetown, Sierra Leone	3316$_{do}$	5980$_{do}$	
1300-1400		Sri Lanka B'casting Corp.	6075$_{as}$	9720$_{as}$	
1300-1400		Voice of Nigeria, Lagos	7255$_{af}$		
1300-1400		KTBN Salt Lake City, Utah	7510		
1300-1400	war	Voice of Peace, Baghdad, Iraq	11860$_{me}$	21675$_{me}$	
1300-1330		Swiss Radio Int'l, Bern	6165$_{eu}$	9535$_{eu}$	12030$_{eu}$
1305-1315	s	Radio Riga, Latvia	15330		
1315-1330		Radio Voice of Lebanon, Beirut	6549.5$_{me}$		
1325-1400	mtwhf	Voice of Kenya, Nairobi	4934$_{do}$		
1330-1400		All India Radio, Delhi	9565$_{as}$	11760$_{as}$	15335$_{as}$
1330-1400		Nat'l Radio of Laos, Vientiane	7112$_{as}$		
1330-1400		Radio Austria Int'l, Vienna	15430$_{as}$		
1330-1400		Radio Douala, Cameroon	4795$_{do}$		
1330-1400	a	Radio Republik Indonesia Jayapura		3385$_{do}$	6070$_{do}$
1330-1400		Swiss Radio Int'l, Bern	7480$_{as}$	11695$_{as}$	13635$_{as}$
			15570$_{as}$	17830$_{as}$	21695$_{as}$
1330-1400		Radio Tashkent, Uzbekistan	9540	9600	15470
1330-1400		UAE Radio, Dubai	15320$_{eu}$	15435$_{eu}$	21605
			21675		
1330-1400		Radio Finland, Helsinki	15400na	21550na	
1330-1400		Radio Canada Int'l, Montreal	6095as	9535as	9700as
			11795as		
1330-1400		Voice of America	6110as	9760as	15155as
			15425as		
1330-1400		Voice of Vietnam, Hanoi	9840$_{as}$	12020$_{as}$	15010$_{as}$

PROGRAMS

Sundays

1300 Radio Norway Int'l: Norway Today. See S 0100.
1315 Radio Beijing: China Anthology. See S 1115.
1325 Radio Beijing: Music Album. See S 1125.
1340 Radio Beijing: Listeners' Letterbox. See S 1140.

Journalists in Africa Number One's editorial offices.

Mondays

1315 Radio Beijing: Current Affairs. See M 1115.
1340 Radio Beijing: Learn to Speak Chinese. See M 1140.

Tuesdays

1315 Radio Beijing: Current Affairs. See M 1115.
1340 Radio Beijing: Listeners' Letterbox. See S 1140.

Wednesdays

1315 Radio Beijing: Current Affairs. See M 1115.
1340 Radio Beijing: Learn to Speak Chinese. See M 1140.

Thursdays

1315 Radio Beijing: Current Affairs. See M 1115.
1340 Radio Beijing: Culture in China. See H 1140.

Fridays

1315 Radio Beijing: Current Affairs or The Business Show. See F 1115.
1340 Radio Beijing: In the Third World. See F 1140.

Saturdays

1300 Radio Norway Int'l: Norway Today. See S 0100.
1315 Radio Beijing: Press Clippings. See S 0015.
1320 Radio Beijing: Travel Talk. See S 0020.
1328 Radio Beijing: Cooking Show. See S 0028.
1335 Radio Beijing: Music from China. See S 0035.

1400 UTC [10:00 AM EDT/7:00 AM PDT]

FREQUENCIES

1400-1410		Malawi B'casting Corp., Blantyre	3381$_{do}$		
1400-1410		Radio Juba, Sudan	9540$_{do}$	9550$_{do}$	
1400-1415		Radio Jordan, Amman	13655??		
1400-1425	mtwhf	BRT, Brussels, Belgium	21810$_{na}$		
1400-1430q		Radio Canada Int'l, Montreal	11935eu	15305eu	15315eu
			15325eu	17795eu	17820eu
			21545eu		
1400-1430		Radio Douala, Cameroon	4795$_{do}$		
1400-1430		Radio Tirana, Albania	9500$_{as}$	11985$_{as}$	
1400-1500		All India Radio, Delhi	9565$_{as}$	11760$_{as}$	15335$_{as}$
1400-1500		Cameroon Radio-TV, Yaounde	4850$_{na}$		
1400-1500		BBC London, England	3955$_{eu}$	5955$_{na}$	5975$_{af}$
			6190$_{af}$	6195$_{as}$	7120$_{eu}$
			7150$_{af}$	7230$_{eu}$	7325$_{me}$
			9410$_{as}$	9600$_{as}$	9740$_{as}$
			11760$_{eu}$	11940$_{af}$	11955$_{as}$
			12095$_{me}$	15070$_{me}$	15220$_{pa}$
			15310$_{me}$	15360$_{af}$	15400$_{af}$
			15420$_{af}$	15590$_{me}$	17640$_{af}$
			17790$_{me}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
1400-1500	s	Radio Canada Int'l, Montreal	11955	17820	
1400-1500		Radio Moscow World Service	6000$_{va}$	9705$_{va}$	9780$_{va}$
			9875$_{va}$	11840$_{va}$	15180$_{va}$
			15280$_{va}$	15375$_{va}$	15435$_{va}$
			15485$_{va}$	15520$_{va}$	17565$_{va}$
			17605$_{va}$	17780$_{va}$	17790$_{va}$
			17810$_{va}$	17840$_{va}$	17870$_{va}$
			17880$_{va}$	21785$_{va}$	
1400-1500		FEBC Radio Int'l, Philippines	11850$_{as}$		
1400-1500		King of Hope, Lebanon	6280$_{me}$		
1400-1500		Radio 1, Accra, Ghana[1]	4915$_{do}$		
1400-1500		Radio 2, Accra, Ghana	7295$_{do}$		
1400-1500		Radio France Int'l, Paris	11910as	17650as	21765as
1400-1500		Radio Beijing, China	7405$_{am}$		
1400-1500		Radio Beijing, China	4200$_{as}$	11815$_{as}$	15135$_{as}$
			15165$_{as}$		
1400-1500		Radio Korea, Seoul, S. Korea	9570$_{as}$		
1400-1500		Radio Luxembourg	15350om		
1400-1500		Radio Nigeria, Lagos	4990$_{do}$	7285$_{do}$	
1400-1500	sa	Radio Tanzania, Dar es Salaam	5985$_{af}$	9684$_{af}$	11765$_{af}$
1400-1500		FEBC Manila, Phillipines	11685pa		
1400-1500		WWCR Nashville, Tennessee	15690am		
1400-1500		KTBN Salt Lake City, Utah	7510		
1400-1500		WYFR Okeechobee, FLorida	6015na	11580sa	17750af
1400-1500		Christian Science World Svc	9530pa	13625pa	13760pa
			15610pa	21670pa	
1400-1500		HCJB Quito, Ecuador	15115na	17890na	25950na
1400-1500		CFRX Montreal	6070do		
1400-1500		Radio Australia, Melbourne	9580pa	21770pa	
1400-1500		WHRI Noblesville, Indiana	9465	11790	
1400-1500		VLW6 Wanneroo, Australia	6140		
1400-1500		RTV Malaysia, Radio 4	7295$_{do}$		
1400-1500		SBC Radio 1, Singapore	5010$_{do}$	5052$_{do}$	11940$_{do}$
1400-1500		SLBS, Freetown, Sierra Leone	3316$_{do}$	5980$_{do}$	
1400-1500		Sri Lanka B'casting Corp.	6075$_{as}$	9720$_{as}$	
1400-1500		Voice of America, Washington	6110$_{as}$	7125$_{as}$	9645$_{as}$
			9760$_{as}$	15160$_{as}$	15205as
			15395$_{as}$	15425	
1400-1500	mtwhf	Voice of Kenya, Nairobi	4934$_{do}$		
1400-1500		Voice of Nigeria, Lagos	7255$_{af}$		
1405-1430		Radio Finland, Helsinki	6120eu	11755eu	11820eu
			15185eu	21550eu	
1415-1500		BBS, Thimphu, Bhutan	5023$_{do}$		
1420-1500		Radio Jordan, Amman	9560??		
1430-1500		Radio Austria Int'l, Vienna	6155$_{eu}$	13730$_{eu}$	21490$_{va}$
1430-1500	mtwhfa	Radio Douala, Cameroon	4795$_{do}$		
1430-1500		Radio Sofia, Bulgaria	11765af	17780af	17825af
1430-1500		Radio Netherlands, Hilversum	5955$_{eu}$	13770eu	15150eu
			17575eu	17605eu	21480eu
1430-1500		Voice of Myanmar, Burma	5990do		
1430-1500		Guizhou PBS, Guiyang, China[4]	3260$_{do}$	7275$_{do}$	
1435-1450		Nei Mongol PBS, Hohot, China	3970$_{do}$	7105$_{do}$	
1445-1500	smwha	Ulaanbaatar Radio, Mongolia	9575$_{as}$	13780$_{as}$	
1445-1500		Vatican Radio, Vatican City	6248$_{eu}$	9645$_{eu}$	11740$_{eu}$

PROGRAMS

Sundays

1401 BBC: Feature. Topical programming on various subjects, including "Mid-life: A Time Of Crisis" (2nd).
1415 Radio Beijing: China Anthology. See S 1115.
1425 Radio Beijing: Music Album. See S 1125.
1430 BBC: Anything Goes. Bob Holness presents a variety of music and other recordings.
1430 Radio Netherlands: Happy Station. See S 1130.
1440 Radio Beijing: Listeners' Letterbox. See S 1140.

Mondays

1405 BBC: Outlook. Conversation, controversy, and color from the UK and the world.
1415 Radio Beijing: Current Affairs. See M 1115.
1430 BBC: Off The Shelf. See M 0430.
1437 Radio Netherlands: Newsline. See S 0037.
1440 Radio Beijing: Learn to Speak Chinese. See M 1140.
1445 BBC: Talks. This month's primary selection is "Keep To The Path" (3rd/10th/17th).
1452 Radio Netherlands: The Research File. See M 1152.

Tuesdays

1405 BBC: Outlook. See M 1405.
1415 Radio Beijing: Current Affairs. See M 1115.
1430 BBC: Off The Shelf. See M 0430.
1437 Radio Netherlands: Newsline. See S 0037.
1440 Radio Beijing: Listeners' Letterbox. See S 1140.
1445 BBC: Classical Music. See M 0145.
1452 Radio Netherlands: Images. See T 1152.

Wednesdays

1405 BBC: Outlook. See M 1405.
1415 Radio Beijing: Current Affairs. See M 1115.
1430 BBC: Off The Shelf. See M 0430.
1437 Radio Netherlands: Newsline. See S 0037.
1440 Radio Beijing: Learn to Speak Chinese. See M 1140.
1445 BBC: Good Books. See M 0315.
1452 Radio Netherlands: Feature. See W 1152.

Thursdays

1405 BBC: Outlook. See M 1405.
1415 Radio Beijing: Current Affairs. See M 1115.
1430 BBC: Off The Shelf. See M 0430.
1437 Radio Netherlands: Newsline. See S 0037.
1440 Radio Beijing: Culture in China. See H 1140.
1445 BBC: Recording Of The Week. See S 0315.
1452 Radio Netherlands: Media Network. See H 1152.

Fridays

1405 BBC: Outlook. See M 1405.
1415 Radio Beijing: Current Affairs or The Business Show. See F 1115.
1430 BBC: Off The Shelf. See M 0430.
1437 Radio Netherlands: Newsline. See S 0037.
1440 Radio Beijing: In the Third World. See F 1140.
1445 BBC: Talks. See S 0445.
1452 Radio Netherlands: Sounds Interesting. See F 1152.

Saturdays

1401 BBC: Sportsworld. Shortwave's "Wide World Of Sports" with Paddy Feeny.
1415 Radio Beijing: Press Clippings. See S 0015.
1420 Radio Beijing: Travel Talk. See S 0020.
1428 Radio Beijing: Cooking Show. See S 0028.

This QSL from Radio Beijing was sent to us by Brian Johnson of San Diego, CA

1435 Radio Beijing: Music from China. See S 0035.
1437 Radio Netherlands: Newsline. See S 0037.
1452 Radio Netherlands: Asiascan. See A 1152.

1500 UTC [11:00 AM EDT/8:00 AM PDT]

FREQUENCIES

1500-1515	smwha	Ulaanbaatar Radio, Mongolia	9575as	13780as	
1500-1525		Radio Netherlands, Hilversum	5955eu	13770eu	15150eu
			17575ee	17605eu	21480eu
1500-1530		Radio Romania Int'l, Bucharest	11775as	11940as	15250as
			15335as	17720as	17745as
1500-1530		Radio Canada Int'l, Montreal	11935eu	15305eu	15325eu
			17820eu	21545eu	
1500-1530	as	Radio Norway, Oslo	15305na	17790na	
1500-1530	sa	Radio Tanzania, Dar es Salaam	5985af	9684af	11765af
1500-1550		Deutsche Welle, Koln, Germany	9735af	11965af	13610af
			17735af	17765af	21600af
1500-1555		FEBA Seychelles	11865af		
1500-1600	s	Radio Canada Int'l, Montreal	11955	17820	
1500-1600		WWCR Nashville, Tennessee	15690am		
1500-1600	whfa	FEBA Seychelles	9590as	15330af	
1500-1600		Voice of America, Washington	7125as	9645as	9700as
			15205va	15260as	15395as
1500-1600		BBC London, England	3955eu	5955na	5975af
			6190af	6195as	7120eu
			7150af	7230eu	7325me
			9410as	9515as	9740as
			11755eu	11940af	11955as
			12095me	15070me	15260pa
			15310me	15360af	15400af
			15420af	15590me	17640af
			17790me	17830af	17885af
			21490af	21660af	21715af
1500-1600		KNLS Anchor Point, Alaska	9615as		
1500-1600		Voice of Myanmar, Burma	5990do		
1500-1600		Radio Moscow World Service	6000va	9705va	9780va
			9875va	11840va	15180va
			15280va	15345va	15325va
			15485va	15520va	17565va
			17605va	17670va	17790va
			17810va	17840va	17870va
			17880va	21785va	
1500-1600		Cameroon Radio-TV, Yaounde	4850do		
1500-1600		FEBC Radio Int'l, Philippines	11685as		
1500-1600		FEBA, Mahe, Seychelles	9590as	11865as	15330as
1500-1600		Radio 1, Accra, Ghana[1]	4915do		
1500-1600		Radio 2, Accra, Ghana	7295do		
1500-1600		Radio Beijing, China	7405am		
1500-1600		Radio Beijing, China	4200as	11815as	15165as
1500-1600		Radio Jordan, Amman	9560??		
1500-1600		Radio Luxembourg	15350om		
1500-1600		Radio Nigeria, Lagos	4990do	7285do	
1500-1600		Radio Pyongyang, North Korea	9325va	9640va	9977va
			11760va		
1500-1600		Christian Science World Svc	9530pa	13625pa	13760pa
			15610pa	21670pa	
1500-1600		Radio Bangladesh	4880		
1500-1600		KTBN Salt Lake City, Utah	7510		
1500-1600		WYFR Okeechobee, Florida	11580na	11830na	17750af
1500-1600		WHRI Noblesville, Indiana	15105	21840	
1500-1600		Radio Australia, Melbourne	11720		
1500-1600		Radio RSA, South Africa	7230af	15210af	15270af
1500-1600		Radio Australia, Melbourne	9580pa	17630as	21770pa
1500-1600		HCJB Quito, Ecuador	15115na	17890na	21455na
			25950na		
1500-1600		WRNO New Orleans	15420na		
1500-1600		RTV Malaysia, Radio 4	7295do		
1500-1600		SBC Radio 1, Singapore	5010do	5052do	11940do
1500-1600		SLBS, Freetown, Sierra Leone	3316do	5980do	
1500-1600		Sri Lanka B'casting Corp.	6075as	9720as	
1500-1600		Voice of Ethiopia, Addis Ababa	9560af		
1500-1600	mtwhf	Voice of Kenya, Nairobi	4934do		
1500-1600		Voice of Nigeria, Lagos	7255af		
1530-1540	mtwhfa	Voice of Greece, Athens	11645eu	15550am	17525am
1530-1600		Radio Zambia Int'l, Lusaka[1]	9505af	11880af	17895af
1530-1600		Radio Sweden, Stockholm	17875na	21500na	
1530-1600		Radio Tanzania, Dar es Salaam	5985af	9684af	11765af
1530-1600		Radio Tirana, Albania	9500af	11835af	
1530-1600		Swiss Radio Int'l, Bern	13685af	15430af	17830af
			21630af		
1530-1600		Sudan Nat'l B'casting Corp.	9540do	9550do	11635do
1530-1600	mtwha	Vatican Radio, Vatican City	6185eu		
1545-1600	mtwhf	Radiodiffusion Nationale de la Republique du Burundi, Bujumbura	6140af		
1545-1600		Vatican Radio, Vatican City	11715as	15090as	17870as
1555-1600	a	FEBA Seychelles	11865af		

PROGRAMS

Sundays

1500 Radio Norway Int'l: Norway Today. See S 0100.
1509 Deutsche Welle: Religion and Society. News and developments concerning the world's major religions.
1513 Deutsche Welle: Through German Eyes. German journalists provide a perspective on world events.
1515 BBC: Concert Hall. Recordings from the world's concert halls.
1515 Radio Beijing: China Anthology. See S 1115.
1525 Radio Beijing: Music Album. See S 1125.
1534 Deutsche Welle: Pop from Germany. A look at the German pop music scene.
1540 Radio Beijing: Listeners' Letterbox. See S 1140.

Mondays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: Feature/Drama. See M 0101.
1515 Radio Beijing: Current Affairs. See M 1115.
1534 Deutsche Welle: Monday Special. An interview or report on an event or development with special relevance for Africa.
1540 Radio Beijing: Learn to Speak Chinese. See M 1140.

Tuesdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener rock music requests.
1515 Radio Beijing: Current Affairs. See M 1115.
1534 Deutsche Welle: Insight. An in-depth feature, giving the background to political events and international developments.
1540 Radio Beijing: Listeners' Letterbox. See S 1140.

The BBC's "Multitrack" presenters (from left): Tim Smith, Graham Bannerman, and Sarah Ward.

Wednesdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: Talks. See M 2315.
1515 Radio Beijing: Current Affairs. See M 1115.
1530 BBC: Comedy Show (except July 3rd: "Two Cheers For June"). The BBC's regular half-hour spot of British humor.
1534 Deutsche Welle: Living in Germany. See M 0116.
1540 Radio Beijing: Learn to Speak Chinese. See M 1140.

Thursdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: Music For A While With Richard Baker. Richard Baker with classical music selections.
1515 Radio Beijing: Current Affairs. See M 1115.
1534 Deutsche Welle: Spotlight on Sport. Background stories and coverage of important sporting events.
1540 Radio Beijing: Culture in China. See H 1140.

Fridays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: Music Review. See H 2315.
1515 Radio Beijing: Current Affairs or The Business Show. See F 1115.
1534 Deutsche Welle: Economic Notebook. A look at the economic scene in Germany and around the world.
1540 Radio Beijing: In the Third World. See F 1140.

Saturdays

1500 Radio Norway Int'l: Norway Today. See S 0100.
1509 Deutsche Welle: Africa Highlight. A weekly feature on an important topic concerning Africa.
1513 Deutsche Welle: Development Forum. Reports and interviews on projects and progress in Africa and Asia.
1515 BBC: Sportsworld. See A 1401.
1515 Radio Beijing: Press Clippings. See S 0015.
1520 Radio Beijing: Travel Talk. See S 0020.
1528 Radio Beijing: Cooking Show. See S 0028.
1534 Deutsche Welle: Science and Technology. See M 0234.
1535 Radio Beijing: Music from China. See S 0035.

English language

shortwave guide

1600 UTC [12:00 PM EDT/9:00 AM PDT]

FREQUENCIES

1600-1605		SBC Radio 1, Singapore	5052$_{do}$	11940$_{do}$	
1600-1610		Malawi B'casting Corp., Blantyre	3381$_{do}$		
1600-1610		Radio Lesotho, Maseru	4800$_{do}$		
1600-1610		Vatican Radio, Vatican City	11715$_{as}$	15090$_{as}$	17870$_{as}$
1600-1615	sa	Radiodiffusion Nationale de la Republique du Burundi, Bujumbura	6140$_{af}$		
1600-1630		Radio Pakistan, Islamabad	13665$_{me}$	15605$_{me}$	17555$_{me}$
			17895$_{af}$	21480$_{af}$	21530$_{me}$
1600-1630		Radio Sofia, Bulgaria	11735$_{af}$	11840$_{af}$	15370$_{af}$
1600-1630	mtwhf	Vatican Radio, Vatican City[ml]	6248$_{eu}$	7250$_{eu}$	9645$_{eu}$
			11740$_{eu}$	15210$_{eu}$	
1600-1630		Voice of America, Washington	3980$_{eu}$	7125$_{as}$	9645$_{as}$
			9700$_{va}$	15205$_{va}$	15260$_{as}$
			15395$_{as}$		
1600-1630		Voice of Vietnam, Hanoi	9840$_{eu}$	12020$_{eu}$	15010$_{eu}$
1600-1630		Radio Canada Int'l, Montreal	11935$_{eu}$	15305$_{eu}$	15325$_{eu}$
			17820$_{eu}$	21545$_{eu}$	
1600-1630	as	Radio Norway, Oslo	21705$_{me}$		
1600-1630	mtwhf	Radio Portugal, Lisbon	21530$_{me}$		
1600-1640		UAE Radio, Dubai, United Arab Emirates	15320$_{af}$	15435$_{eu}$	21605$_{eu}$
			21675$_{af}$		
1600-1650		Deutsche Welle, Koln, Germany	6170$_{as}$	7225$_{as}$	15105$_{as}$
			15415$_{as}$	15595$_{as}$	17810$_{as}$
			21680$_{as}$		
1600-1700		BSKSA Saudi Arabia	9705$_{eu}$	9720$_{eu}$	
1600-1700		Radio 1, Accra, Ghana[1]	4915$_{do}$		
1600-1700		Radio 2, Accra, Ghana	7295$_{do}$		
1600-1700		Radio Beijing, China	4130$_{af}$	9570$_{af}$	15110$_{af}$
			15130$_{af}$		
1600-1700		BBC London, England	3955$_{eu}$	5955$_{na}$	5975$_{af}$
			6190$_{af}$	6195$_{as}$	7120$_{eu}$
			7150$_{af}$	7230$_{eu}$	7325$_{me}$
			9410$_{as}$	9515$_{as}$	9740$_{as}$
			11775$_{na}$	11940$_{af}$	11955$_{as}$
			12095$_{me}$	15070$_{me}$	15260$_{pa}$
			15310$_{me}$	15360$_{af}$	15400$_{af}$
			15420$_{af}$	15590$_{me}$	17640$_{af}$
			17705$_{me}$	17830$_{af}$	17885$_{af}$
			21470$_{af}$	21660$_{af}$	21715$_{af}$
1600-1700		Voice of the Somali People	6320$_{do}$		
1600-1700		Radio Moscow World Service	6000$_{va}$	9705$_{va}$	9780$_{va}$
			9875$_{va}$	11840$_{va}$	15175$_{va}$
			15280$_{va}$	15325$_{va}$	15485$_{va}$
			15465$_{va}$	15520$_{va}$	17565$_{va}$
			17670$_{va}$	17780$_{va}$	17790$_{va}$
			17810$_{va}$	17840$_{va}$	17870$_{va}$
			17880$_{va}$	21645$_{va}$	
1600-1700		Radio Jordan, Amman	9560$_{me}$		
1600-1700		Radio Korea, Seoul, S. Korea	5975$_{om}$	9870$_{af}$	
1600-1700		Radio Australia, Melbourne	9580$_{pa}$	17630$_{as}$	21770$_{pa}$
1600-1700		Radio Luxembourg	15350$_{om}$		
1600-1700		Radio Nigeria, Lagos	4990$_{do}$		
1600-1700		Radio RSA, South Africa	7230$_{af}$	15210$_{af}$	15270$_{af}$
1600-1700		Radio Tanzania, Dar es Salaam	5985$_{af}$	9684$_{af}$	11765$_{af}$
1600-1700		Radio Zambia Int'l, Lusaka[1]	9505$_{af}$	11880$_{af}$	17895$_{af}$
1600-1700		SLBS, Freetown, Sierra Leone	3316$_{do}$	5980$_{do}$	
1600-1700		Sri Lanka B'casting Corp.	6075$_{as}$	9720$_{as}$	
1600-1700	mtwhf	Tristan Radio, Tristan da Cunha	3290$_{do}$		
1600-1700		Voice of America, Washington	9575$_{af}$	11920$_{af}$	15410$_{af}$
			15580$_{af}$	17800$_{af}$	21625$_{af}$
1600-1700		WRNO New Orleans, Louisiana	15420		
1600-1700		KTBN Salt Lake City, Utah	15590am		
1600-1700		WWCR Nashville, Tennessee	15690am		
1600-1700		WHRI Noblesville, Indiana	15105am	17830am	
1600-1700		WYFR Okeechobee, Florida	11580am	11830am	15355am
			17750af	21525eu	21615af
1600-1700		Radio France Int'l, Paris	11705af	12015af	6175eu
			15530me	17620af	17795af
			17850af		
1600-1700		Christian Science WorldSvc	11580as	13625as	15610am
			17555am	21640af	
1600-1700	mtwhf	Voice of Kenya, Nairobi	4934$_{do}$		
1600-1700		Voice of Nigeria, Lagos	7255$_{af}$		
1610-1615	mtwhf	Radio Botswana, Gaborone	5955$_{af}$	7255$_{af}$	
1615-1630	s	Radiodiffusion Nationale de la Republique du Burundi, Bujumbura	6140$_{af}$		
1615-1630	mh	Radio Budapest, Hungary	7220$_{eu}$	9585$_{eu}$	9835$_{eu}$
			11910$_{eu}$	15160$_{eu}$	15220$_{eu}$
1615-1700		Swiss Radio Int'l, Bern[1]	11955$_{eu}$		
1630-1700		Radio Austria, Vienna	6155$_{eu}$	11780as	13730eu
			21490$_{eu}$		
1630-1700		Radio Canada Int'l, Montreal	7150as	9555as	
1630-1700	mtwhfa	Radio Netherlands	6020af	15570af	
1630-1700		Radio Cairo, Egypt	15255$_{af}$		
1630-1700		HCJB Quito, Ecuador	21455	21480	25950
1630-1700	mwf	Alma Ata Radio, USSR	5035do	5915do	6135do
1630-1700		RTV Rwandiase, Kigali, Rwanda	3330	6055	
1630-1700	mtwhf	RTV Morocco, Rabat	15335$_{af}$	15360$_{af}$	17595$_{af}$
1630-1700		Voice of America, Washington	7125$_{as}$	9645$_{as}$	9700va
			11740$_{va}$	15205$_{va}$	15245va
			15260as	15395va	3980eu
			6040eu		

PROGRAMS

Sundays

1600 Radio Norway Int'l: Norway Today. See S 0100.
1609 Deutsche Welle: Arts on the Air. See S 1109.
1615 BBC: Feature. See S 0230.
1615 Radio Beijing: China Anthology. See S 1115.
1625 Radio Beijing: Music Album. See S 1125.
1634 Deutsche Welle: German by Radio. See S 0134.
1640 Radio Beijing: Listeners' Letterbox. See S 1140.
1645 BBC: Letter From America. See S 0545.

Mondays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: New Ideas. Innovative developments in technology and new products.
1615 Radio Beijing: Current Affairs. See M 1115.
1634 Deutsche Welle: Asia-Pacific Report. Correspondents' reports, interviews, and background news from the Asia-Pacific region.
1635 BBC: Talks. Brief conversations on various subjects.
1637 Radio Netherlands: Newsline. See S 0037.
1640 Radio Beijing: Learn to Speakof the international scene.
1652 Radio Netherlands: The Research File. See M 1152.

Tuesdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Megamix. See T 1130.
1615 Radio Beijing: Current Affairs. See M 1115.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1637 Radio Netherlands: Newsline. See S 0037.
1640 Radio Beijing: Listeners' Letterbox. See S 1140.
1645 BBC: The World Today. See M 1645.
1652 Radio Netherlands: Images. See T 1152.

Wednesdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Rock/Pop Music. See T 0630.
1615 Radio Beijing: Current Affairs. See M 1115.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1637 Radio Netherlands: Newsline. See S 0037.
1640 Radio Beijing: Learn to Speak Chinese. See M 1140.
1645 BBC: The World Today. See M 1645.
1652 Radio Netherlands: Feature. See W 1152.

Thursdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Network UK. Issues and events affecting people across the UK.
1615 Radio Beijing: Current Affairs. See M 1115.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1637 Radio Netherlands: Newsline. See S 0037.
1640 Radio Beijing: Culture in China. See H 1140.
1645 BBC: The World Today. See M 1645.
1652 Radio Netherlands: Media Network. See H 1152.

Fridays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Science in Action. The latest news about scientific innovations.
1615 Radio Beijing: Current Affairs or The Business Show. See F 1115.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1637 Radio Netherlands: Newsline. See S 0037.
1640 Radio Beijing: In the Third World. See F 1140.
1645 BBC: The World Today. See M 1645.
1652 Radio Netherlands: Sounds Interesting. See F 1152.

Saturdays

1600 Radio Norway Int'l: Norway Today. See S 0100.
1609 Deutsche Welle: International Talking Point. See S 0419.
1615 BBC: Sportsworld. See A 1401.
1615 Radio Beijing: Press Clippings. See S 0015.
1620 Radio Beijing: Travel Talk. See S 0020.
1623 Deutsche Welle: Development Forum. See A 1513.
1628 Radio Beijing: Cooking Show. See S 0028.
1634 Deutsche Welle: Religion and Society. See S 1509.
1635 Radio Beijing: Music from China. See S 0035.
1637 Radio Netherlands: Newsline. See S 0037.
1652 Radio Netherlands: Airtime Africa. Music, discussion with studio guests, and analysis of the issues that concern both Europe and Africa.

1700 UTC [1:00 PM EDT/10:00 AM PDT]

FREQUENCIES

1700-1705		Radio 2, Accra, Ghana	7295do	
1700-1710		Radio Bafoussam, Cameroon[1]	4000do	
1700-1715		Kol Israel, Jerusalem	11588eu	11655eu
1700-1725		Radio Netherlands, Hilversum	6020af	15570af
1700-1728		SLBS, Freetown, Sierra Leone	3316do	5980do
1700-1730		Radio Sweden, Stockholm	6065eu	9615eu
1700-1730		Radio Canada Int'l, Montreal	7235eu	9555eu 15325eu
			17820eu	21545eu
1700-1730	as	Radio Norway, Oslo	9655eu	
1700-1730		Radio Jordan, Amman	9560me	
1700-1730		Sri Lanka B'casting Corp.	6075as	9720as
1700-1800		Voice of America, Washington	3980va	6040va
			7125as	9645as 9700va
			9760va	15205va 15395as
			11760eu	15245eu 15260eu
1700-1800		B'casting Service of the Kingdom of Saudi Arabia, Riyad	9705eu	9720eu
1700-1800		Radio 1, Accra, Ghana[1]	4915do	
1700-1800		Radio Africa, Equatorial Guinea	7190af	
1700-1800		Radio Beijing, China	4130af	7405af 8260af
			9570af	11575af
1700-1800		Radio Cairo, Egypt	15255af	
1700-1800		Radio Luxembourg	15350om	
1700-1800		BBC London, England	3955eu	5955na 5975af
			6190af	6195as 7120eu
			7150af	7230eu 7325me
			9410as	9515as 9640as
			11775eu	11940af 11955as
			12095me	15070me 15260pa
			15310me	15360af 15400af
			15420af	15590me 17640af
			17790me	17830af 17885af
			21470af	21660af 21715af
1700-1800		WRNO New Orleans, Louisiana	15420	
1700-1800		WWCR Nashville, Tennessee	15690	
1700-1800		KTBN Salt Lake City, Utah	15590	
1700-1800		WHRI Noblesville, Indiana	15105	17830
1700-1800		WYFR Okeechobee, Florida	13760am	21500eu
1700-1800		Christian Science World Svc	11580as	13625as 17555am
			15610am	21640af
1700-1800		Radio Moscow World Service	6000va	9705va 9780va
			9875va	11840va 15185va
			15280va	15375va 15435va
			15465va	15520va 17565va
			17695va	17780va 17790va
			17810va	17840va 17870va
			17880va	21845va
1700-1800		WMLK Bethel, Pennsylvania	9465eu	
1700-1800		Radio Japan, Tokyo	11865na	
1700-1800		Radio RSA, South Africa	7230af	15210af 15270af
			17710af	17835af
1700-1800		Radio Tanzania, Dar es Salaam	5985af	9684af 11765af
1700-1800		Radio Zambia Int'l, Lusaka[1]	9505af	11880af 17895af
1700-1800	mtwhfa	RTV Morocco, Rabat	15335af	17595af 17815af
1700-1800		Radio Nigeria, Lagos	3326do	4990do
1700-1800		HCJB Quito, Ecuador	21480am	
1700-1800		Radio Pyongyang, North Korea	9325va	9640va 9977va
			11760va	
1700-1800		Voice of America, Washington	9575af	11920af 15410af
			15580af	17800af 21625af
1700-1800	mtwhf	Voice of Kenya, Nairobi	4934do	
1700-1800		Voice of Nigeria, Lagos	7255af	
1700-1800	war	Voice of Peace, Baghdad, Iraq	6055me	11860me 21675me
1706-1800		Radio 2, Accra, Ghana	3366do	
1715-1730		Radio Buea, Cameroon[1]	3970do	
1715-1800		Radio Pakistan, Islamabad	11570eu	15605eu
1728-1800		SLBS, Freetown, Sierra Leone	3316do	
1730-1745		Radio Bayrak, Cyprus	6150va	
1730-1745	a	Radio Douala, Cameroon	4795do	
1730-1800		BRT Brussels, Belgium	21815af	
1730-1800		Radio Sofia, Bulgaria	11765af	17780af 17825af
1730-1800		Radio Austria Int'l, Vienna	5945eu	6155eu 12010me
			13730af	
1730-1800		Radio Romania Int'l, Bucharest	15365af	17720af 17745af
1730-1800		Vatican Radio, Vatican City	17710af	17730af 21650af
			25950	
1740-1800		Cameroon Radio-TV, Yaounde	4850do	
1745-1800	mtwhfa	Radio Douala, Cameroon	4795do	
1745-1800		RTV Madagascar, Antananarivo	3232do	3286do 5005do

1800 UTC [2:00 PM EDT/11:00 AM PDT]

FREQUENCIES

1800-1810		Malawi B'casting Corp., Blantyre	3381do	
1800-1830	as	Radio Norway, Oslo	17755na	
1800-1830		Radio Canada Int'l, Montreal	15260af	13670af 17820af
1800-1830		Radio Sofia, Bulgaria	11765af	17780af 17825af
1800-1830		Radio Cairo, Egypt	15255af	
1800-1830		Radio Sweden, Stockholm	6065va	9655va 11900va
1800-1830		RTV Congolaise, Brazzaville[1]	3265af	4765af
1800-1830		Voice of Vietnam, Hanoi	9840eu	12020eu 15010eu
1800-1840	w	Radio Bertoua, Cameroon	4750do	
1800-1845	mtwhfa	Radio Douala, Cameroon	4795do	
1800-1900		All India Radio, Delhi	11935af	
1800-1900		B'casting Service of the Kingdom of Saudi Arabia, Riyad	9705eu	9720eu
1800-1900		Cameroon Radio-TV, Yaounde	4850do	
1800-1900		Radio 1, Accra, Ghana[1]	4915do	
1800-1900		Radio 2, Accra, Ghana	7295do	
1800-1900		Radio Africa, Equatorial Guinea	7190af	
1800-1900		Radio Luxembourg	15350om	
1800-1900		Radiobras, Brasilia, Brasil	15265eu	
1800-1900		Radio Korea, Seoul	15575eu	
1800-1900		KNLS Anchor Point, Alaska	9615as	
1800-1900		KTBN Salt Lake City, Utah	15590	
1800-1900		WHRI Noblesville, Indiana	13760na	15105sa
1800-1900		Voice of Ethiopia, Addis Ababa	9662af	
1800-1900		WRNO New Orleans, Louisiana	15420na	
1800-1900		WWCR Nashville, Tennessee	15690na	
1800-1900		Christian Science World Svc	13625as	15610am 17555am
			21640af	
1800-1900		WYFR Okeechobee, Florida	21500na	
1800-1900		Radio Mozambique, Maputo	3265af	4855af 9618af
1800-1900		BBC London, England	5975eu	9410eu 9740eu
			11750pa	12095eu 15070eu
			15310af	15400af 17640af
1800-1900		Radio Moscow World Service	7170va	7235va 7315va
			9765va	9795va 9830va
			9875va	11630va 11840va
			15375va	17670va 17695
			21660va	21845va
1800-1900		Radio New Zealand Int'l	13785pa	
1800-1900		Radio Nigeria, Lagos	3326do	4990do
1800-1900		Radio Tanzania, Dar es Salaam	5985af	9684af 11765af
1800-1900		Radio for Peace Int'l, Costa Rica	13660am	21566 25945 all
1800-1900		Radio Zambia Int'l, Lusaka[1]	9505af	11880af 17895af
1800-1900		SLBS, Freetown, Sierra Leone	3316do	
1800-1900		Voice of America, Washington	9575af	11920af 15410af
			15580af	17800af 21625af
1800-1900	mtwhf	RAE Buenos Aires, Argentina	11710	
1800-1900		Voice of America, Washington	3980eu	6040va 9700va
			9760va	11760eu 15205eu
			15245eu	
1800-1900		CFRX Montreal	6070do	
1800-1900		WMLK Bethel, Pennsylvania	9465eu	
1800-1900	mtwhf	Voice of Kenya, Nairobi	4934do	
1800-1900		Voice of Peace, Baghdad, Iraq	6055me	11860me 21675me
1800-1830	a	Radio Riga Int'l, Latvia, USSR	5935eu	
1815-1830		Kol Israel, Jerusalem	11585eu	11655eu
1815-1900		Radio Bangladesh, Dhaka	12030as	15255as
1815-1830		Radio Voice of Lebanon, Beirut	6549.5me	
1830-1900		Radio Afghanistan, Kabul	7310eu	9635eu
1830-1900	as	Radio Canada Int'l, Montreal	15260eu	17820eu
1830-1900		Radio Netherlands, Hilversum	6020af	15570af 17605af
			21685af	
1830-1900		Radio Sweden, Stockholm	6065va	15270va
1830-1900		Radio Kuwait (speculative)	11675/13610	
1830-1900		Radio Sofia, Bulgaria	11660eu	11720eu 15330eu
1830-1900		Radio Tirana, Albania	7120eu	9480eu
1830-1900		Sri Lanka B'casting Corp.	9720eu	15120eu
1830-1900		Radio Finland, Helsinki	6120eu	9550eu 11755eu
			15185eu	
1830-1900		Swiss Radio Int'l, Bern	9885af	11955af
1840-1850		Voice of Greece, Athens	11645af	15650af
1845-1900		Ghana B'casting Corp., Accra	6130af	
1845-1900		RTV Guinea, Conakry	4900af	7125af
1845-1900	s	RTV Mali, Bamako[3]	4783do	5995do 7285do
			11960do	

1900 UTC [3:00 PM EDT/12:00 PM PDT]

FREQUENCIES

1900-1915		Radio Tanzania, Dar es Salaam	5985af	9684af	11765af
1900-1925		Radio Netherlands, Hilversum	6020af	15570af	17605af 21685af
1900-1930		Kol Israel, Jerusalem	9435na	11605na	15640na 17630af
1900-1930		Radio Canada Int'l, Montreal	5995eu	7235eu	13650eu 15325eu 17875eu 21675eu
1900-1930	as	Radio Norway, Oslo	15175eu	17750pa	
1900-1930	mtwhf	Radio Canada Int'l, Montreal	15260af	13670af	17820af
1900-1930		Radio Afghanistan, Kabul	7310eu	9635eu	
1900-1930	t	Radio Budapest, Hungary	6110eu	7220eu	9520eu 9585eu 9835eu 11910eu
1900-1930		Voice of Vietnam, Hanoi	9840eu	12020eu	15010eu
1900-1945		Cameroon Radio-TV, Yaounde	4850na		
1900-1950		Deutsche Welle, Koln, Germany	9760af	11785af	11810af 13790af 15350af 15390af 17810af
1900-2000		All India Radio, Delhi	11935af		
1900-2000		B'casting Service of the Kingdom of Saudi Arabia, Riyad	9705eu	9720eu	
1900-2000		Ghana B'casting Corp., Accra	6130af		
1900-2000		Radio for Peace Int'l, Costa Rica	13660	21566	25945 all am
1900-2000		Radio 1, Accra, Ghana[1]	4915do		
1900-2000		WMLK Bethel, Pennsylvania	9465eu		
1900-2000		Radio 2, Accra, Ghana	7295do		
1900-2000		HCJB Quito, Ecuador	21455eu	21480eu	25950eu
1900-2000		Radio Africa, Equatorial Guinea	7190af		
1900-2000		Radio Algiers, Alger, Algeria	9640	15215	
1900-2000		Radio Kuwait (speculative)	11675/13610		
1900-2000		Radio Beijing, China	6955af	9440af	11515af
1900-2000		Radio Havana Cuba	15435eu		
1900-2000		Radio Luxembourg	15350om		
1900-2000	smtwhf	Radio New Zealand Int'l	13785pa		
1900-2000		KTBN Salt Lake City, Utah	15590		
1900-2000		WHRI Noblesville, Indiana	13760	17830	
1900-2000		WRNO New Orleans, Louisiana	15420		
1900-2000		WWCR Nashville, Tennessee	15690		
1900-2000		Christian Science World Svc	13625as	17555am	21640af 21780am
1900-2000		WYFR Okeechobee, Florida	15355af	21615eu	
1900-2000		Radio Nigeria, Lagos	3326do	4990do	
1900-2000		Radio Zambia Int'l, Lusaka[1]	9505af	11880af	17895af
1900-2000	s	RTV Morocco, Rabat	15335af		
1900-2000		SLBS, Freetown, Sierra Leone	3316do		
1900-2000		Sri Lanka B'casting Corp.	9720eu	15120eu	
1900-2000		Voice of America, Washington	9575af	11920af	15410af 15580af 17800af 21625af
1900-2000		BBC London, England	5975va	7325va	9410va 12095va 15070va 17885va
1900-2000		Voice of America, Washington	3980eu	6040va	9525as 9700va 9760va 11760va 11870as 15180as 15205va 15245as
1900-2000	mtwhf	Voice of Kenya, Nairobi	4934do		
1900-2000		Radio Moscow World Service	11840am	15185eu	15375af 17670af 17695af
1900-2000		Voice of Nigeria, Lagos	7255af		
1910-1915		Radio Botswana, Gaborone	3356af		
1920-1930		Voice of Greece, Athens	7430	9395	
1920-1930		Radio Buea, Cameroon[1]	3970do		
1930-1940		Radio Austria Int'l, Vienna	5945eu	6155eu	12010me 13730af
1930-1940	irr	Radio Burkina, Burkina Faso	4815af	7230af	
1930-2000		Radio Budapest, Hungary	6110eu	7220eu	9520eu 9585eu 9835eu 11910eu
1930-2000		Radio Canada Int'l, Montreal	6170eu	9650eu	9670eu 13650eu 15325eu 17825eu 21675eu
1930-2000		Radio Romania Int'l, Bucharest	5990eu	7195eu	9690eu
1930-2000	tes	KFBS Saipan	9475af		
1930-2000		Radio Sweden, Stockholm	6065va	9655va	
1930-2000		Voice of the Islamic Republic of Iran, Tehran	6030eu	9022eu	
1935-1955		RAI, Rome, Italy	7275eu	9710eu	11800eu
1935-1945		RTV Togo, Lome	5047af		
1940-2000	smwha	Ulaanbaatar Radio, Mongolia	11850eu	12015eu	
1945-2000	mwf	Tristan Radio, Tristan da Cunha	3290do		
1950-2000		Sudan Nat'l B'casting Corp.	9540do	9550do	11635do
1955-2000		Radio Finland, Helsinki	6120eu	9550eu	11755eu 15185eu

Jess Bunshaft of East Meadow, NY submits three unique QSLs.

Left, Swiss Radio International; Below, Radio Praha; Right, BRT Belgium

2000 UTC [4:00 PM EDT/1:00 PM PDT]

FREQUENCIES

2000-2010	w	Malawi B'casting Corp., Blantyre	3381do
2000-2010	mtwhf	Voice of Kenya, Nairobi	4934do
2000-2010	smwha	Ulaanbaatar Radio, Mongolia	11850eu 12015eu
2000-2030	as	Radio Norway, Oslo	15165na
2000-2030		Radio Romania Int'l, Bucharest	5990eu 7195eu 9690eu
2000-2030		Swiss Radio Int'l, Bern[1]	3985eu 6165eu 9535eu
2000-2030	mtwhf	Radio Portugal, Lisbon	11740eu
2000-2030		Voice of Nigeria, Lagos	7255af
2000-2100	tes	KFBS Saipan	9475af
2000-2100		B'casting Service of the Kingdom of Saudi Arabia, Riyad	9705eu 9720eu
2000-2100		King of Hope, Lebanon	6280me
2000-2100		Radio 1, Accra, Ghana[1]	4915do
2000-2100		Radio 2, Accra, Ghana	7295do
2000-2100		KNLS Anchor Point, Alaska	11910as
2000-2100		Radio Africa, Equatorial Guinea	7190af
2000-2100		Radio Kuwait (speculative)	11675/13610
2000-2100		Radio Beijing, China	9440af 11715af 15110af
2000-2100		Radio Beijing, China	4130eu 8260eu 9920eu 11500eu
2000-2100		BBC London, England	5975va 7325va 9410va 12095va 15070va 15260va 17885af
2000-2100		Radio Havana Cuba	17705eu
2000-2100		Radio Luxembourg	15350om
2000-2100	smtwhf	Radio New Zealand Int'l	13785pa
2000-2100		Radio for Peace Int'l, Costa Rica	13660 21566 25945 all am
2000-2100		Radio Nigeria, Lagos	3326do 4990do
2000-2100		Radio Moscow World Service	11840am 15185eu 17695af
2000-2100		Radio Pyongyang, North Korea	9345va 9640va 9977va
2000-2100		KTBN Salt Lake City, Utah	15590
2000-2100		WHRI Noblesville, Indiana	13760af 15105sa
2000-2100		WRNO New Orleans, Louisiana	15420
2000-2100		WWCR Nashville, Tennessee	15690
2000-2100		Voice of Turkey, Ankara	9795eu
2000-2100		Christian Science World Svc	9455as 13625pa 13770am 17555sa 15610eu
2000-2100		KVOH Los Angeles, California	17775am
2000-2100		WYFR Okeechobee, Florida	15566eu 17612af 21525eu 21615eu
2000-2100	s	Radio Zambia Int'l, Lusaka[1]	9505af 11880af 17895af
2000-2100		SLBS, Freetown, Sierra Leone	3316do
2000-2100	mwf	Tristan Radio, Tristan da Cunha	3290do
2000-2100		Voice of America, Washington	9570af 15410af 15580af 17800af 21485af 21625af
2000-2100		Voice of America, Washington	3980eu 6040va 9700va 9760va 11760va 15205va 15245va
2000-2100		Voice of Indonesia, Jakarta	7125as 9675as 11752as 11785as
2005-2100		Radio Damascus, Syria	12085na 15095na
2010-2100	sa	Voice of Kenya, Nairobi	4934do
2015-2030		Voix de la Revolution Benin	4870af 5025af
2015-2045	sth	Voice of Resistance of Black Cockerel (Angolan clandestine)	9700af
2020-2030	mtwhfa	Voice of Greece, Athens	9395eu 11645eu
2025-2045		RAI, Rome, Italy	7235me 9575me 11800me
2030-2100		Radio Sofia, Bulgaria	11660eu 11720eu 15330eu
2030-2100		Radio Sweden, Stockholm	6065na
2030-2100		Radio Cairo, Egypt	15375af
2030-2100		Radio Korea, Seoul, s.Korea	6480eu 7550af 15575eu
2030-2100		Radio Netherlands, Hilversum	7285af 9860af 9895af 11660af 13700af
2030-2100		Voice of Vietnam, Hanoi	9840eu 12020eu 15010eu
2045-2100		All India Radio, Delhi	7412eu 9665eu 9910eu 11620eu 11715eu 15265eu
2050-2100		Vatican Radio, Vatican City	6248eu 7250eu

2100 UTC [5:00 PM EDT/2:00 PM PDT]

FREQUENCIES

2100-2105		Radio Damascus, Syria	12085na 15095na
2100-2110		Malawi B'casting Corp., Blantyre	3381do
2100-2110		Vatican Radio, Vatican City	6248eu 7250eu
2100-2125		Radio Netherlands, Hilversum	7285af 9860af 9895af 11660af 13700af
2100-2130		King of Hope, Lebanon	6280me
2100-2130		Radio Korea, Seoul	6480eu 7550af 15575eu
2100-2130		Radio Budapest, Hungary	6110eu 7220eu 9520eu 9585eu 9835eu 11910eu
2100-2130		Radio Romania Int'l, Bucharest	5990eu 6105eu 7105eu 7195eu 9690eu
2100-2130	mtwhf	Radio Portugal, Lisbon	15250af
2100-2130		Swiss Radio Int'l, Bern	12035af 13635af 15525af
2100-2130		Radio Canada Int'l, Montreal	5995eu 7235eu 13650eu
2100-2130		Vatican Radio, Vatican City	17710af 17730af 21650af
2100-2145		Radio Yugoslavia, Belgrade	5960eu 11735na
2100-2150		Deutsche Welle, Koln, Germany	9760as 9765as 11785as 13780as 15350as 15360as
2100-2200		Radio Kiev, Ukranian SSR	6185eu
2100-2200		Radio 1, Accra, Ghana[1]	4915do
2100-2200		Radio 2, Accra, Ghana	7295do
2100-2200		Radio Africa, Equatorial Guinea	7190af
2100-2200		Radio New Zealand Int'l	13785pa
2100-2200		Radio Baghdad, Iraq	13660eu
2100-2200		Radio Beijing, China	4130eu 9920eu 11500eu
2100-2200		Radio Cairo, Egypt	15375af
2100-2200		SLBC Sri Lanka	15120as
2100-2200		Radio Luxembourg	15350om
2100-2200		Radio for Peace Int'l, Costa Rica	13660 21566 25945 all am
2100-2200		R. Nacional de Angola, Luanda	3355af 9535af
2100-2200		Radio Nigeria, Lagos	3326do 4990do
2100-2200		Radio Zambia Int'l, Lusaka[1]	9505af 11880af 17895af
2100-2200		SLBS, Freetown, Sierra Leone	3316do
2100-2200	mwf	Tristan Radio, Tristan da Cunha	3290do
2100-2200		Radio Moscow World Service	11840am 11675af 15500eu 17695af 17735am
2100-2200		Voice of America, Washington	15410af 15580af 17800af 21485af 21625af
2100-2200		BBC London, England	5975va 7325va 9590na 12095va 15070va 15260na 15400af 21660ca
2100-2200		KTBN Salt Lake City, Utah	15590
2100-2200		WHRI Noblesville, Indiana	13760 17830
2100-2200		WRNO New Orleans, Louisiana	15420
2100-2200		WWCR Nashville, Tennessee	15690
2100-2200		Radio Canada Int'l, Montreal	15325eu 17875eu
2100-2200		Christian Science World Svc	9455as 13625pa 13770am 17555sa 15610eu
2100-2200		WYFR Okeechobee, Florida	15566af 17612af 21525eu 21615eu
2100-2200		KVOH Los Angeles, California	17775
2100-2200		Voice of America, Washington	3980eu 6040va 9700va 9760va 11760va 11870as 11960va 15185as 15205va 15245as 17735as
2100-2200		Voice of Peace, Baghdad, Iraq	6055me 11860me 21675me
2110-2200		Radio Damascus, Syria	12085na 15095na
2115-2200		Radio Cairo, Egypt	9900eu
2115-2130	s	R. Republik Indonesia Jayapura	6070do
2130-2145		Radio Buea, Cameroon[1]	3970do
2130-2200		Radio Canada Int'l, Montreal	11880af 15150af 17820af
2130-2200		Kol Israel , Jerusalem	9435na 11588eu 11605na 11655na 15640na 17630af
2130-2200		Radio Sofia, Bulgaria	11660eu 15330eu
2130-2200		Radio Finland, Helsinki	6120eu 11755eu
2130-2200		Radio Vilnius, Lithuania, USSR	6100eu
2130-2200		UAE Radio, Dubai	11795na 13675na 15320na 15400na
2130-2200		HCJB Quito, Ecuador	21455eu 21480eu
2130-2200	smtwhf	King of Hope, Lebanon	6280me
2145-2200		Cameroon Radio-TV, Yaounde	4850na

2200 UTC [6:00 PM EDT/3:00 PM PDT]

FREQUENCIES

2200-2210		Radio Bafoussam, Cameroon[1]	4000do		
2200-2210		Radio Damascus, Syria	12085na	15095na	
2200-2215		Cameroon Radio-TV, Yaounde	4850na		
2200-2215		Radio Zambia Int'l, Lusaka[1]	9505af	11880af	17895af
2200-2218		RTV Congolaise, Brazzaville	4765do	5985do	
2200-2225		BRT, Brussels, Belgium	5910eu	9925eu	15515af
2200-2225		RAI, Rome, Italy	5990as	9710as	11800as
2200-2230		All India Radio, Delhi	7412eu	9665eu	9910eu
			11620eu	11715eu	15265eu
2200-2230		Radio Canada Int'l, Montreal	5960na	9755na	11905as
			13670ca		
2200-2230		Radio Beijing, China	3985eu		
2200-2230	a	Radio Republik Indonesia Kupang	3385do	4805do	
2200-2230		Radio Prague, Czechoslovakia	5930eu	6055eu	7345eu
2200-2230	s	KGEI San Fransisco, California	15280sa		
2200-2230		Radio Sweden, Stockholm	6065va		
2200-2230		Radio Sofia, Bulgaria	11660eu	15330eu	
2200-2230		Radio Vilnius, Lithuania, USSR	11790na	13645na	15180na
			15455na	15485na	
2200-2230	as	Radio Norway, Oslo	21705va		
2200-2230		Voice of the UAE, Abu Dhabi United Arab Emirates	9600??	11985??	13605??
2200-2245		Radio Cairo, Egypt	9900eu		
2200-2300		DZAS,Metro-Manila,Philippines[1]	6030do		
2200-2300		Voice of Turkey, Ankara	7225eu	9445na	9685eu
			17880as		
2200-2300		Radio 1, Accra, Ghana[1]	4915do		
2200-2300		Radio 2, Accra, Ghana	7295do		
2200-2300		Radio for Peace Int'l, Costa Rica	13660	21566	25945 all am
2200-2300	sa	Radio Africa, Equatorial Guinea	7190af		
2200-2300		Radio Baghdad, Iraq	13660eu		
2200-2300		Radio Havana Cuba	7215eu		
2200-2300		Radio Luxembourg	15350om		
2200-2300		Radio New Zealand Int'l	17770pa		
2200-2300		Radio Nigeria, Lagos	3326do	4990do	
2200-2300	smtwha	RTV Malaysia, Radio 4	7295do		
2200-2300		SBC Radio 1, Singapore	5010do	5052do	11940do
2200-2300		KTBN Salt Lake City, Utah	15590		
2200-2300		WHRI Noblesville, Indiana	13760na	17830sa	
2200-2300		Radio Station Peace & Progress	11980am		
2200-2300		CBC Montreal	9625do		
2200-2300		CFRX Montreal	6070do		
2200-2300		Radio Moscow North American Svc	9220na	11675na	15500na
			15535na	17575na	
2200-2300		WRNO New Orleans, Louisiana	13720na		
2200-2300		WWCR Nashville, Tennessee	15690na		
2200-2300		Christian Science World Svc	9465na	13625as	15405as
			17555sa	15300af	
2200-2300		WYFR Okeechobee, Florida	17612af	21525eu	
2200-2300		SLBS, Freetown, Sierra Leone	3316do		
2200-2300		Radio Moscow World Service	11630va		
2200-2300		Voice of America, Washington	6095as	7120va	9770as
			11760as	15185va	15215va
			15255as	15290as	15305va
			17735as	17810as	17820as
			17885va		
2200-2300		BBC London, England	5975va	7325va	9410va
			12095va	15070va	17885va
2205-2300		Vatican Radio, Vatican City	7125as	9615as	11830as
2230-2300		Capital Radio, Abu Dhabi United Arab Emirates	11985eu	13605eu	17855na
2230-2300		Radio Sofia, Bulgaria	9700eu	11680eu	
2230-2300		Radio Tirana, Albania	7215eu	9480eu	
2230-2300		Swiss Radio Int'l, Bern[1]	6190eu		
2240-22250		Voice of Greece, Athens	11645am		

Radio Vilnius: ***Is Moscow timing Vilnius at 2300 during the summer to confuse listeners? 2200 is announced but the broadcast has been airing at 2300 even after the time change in Europe)***

QSL from Radio Moscow, courtesy of R . Rogers, Vancouver, British Columbia

2300 UTC [7:00 PM EDT/4:00 PM PDT]

FREQUENCIES

2300-2315		DZAS, Metro-Manila, Philippines[1]	6030$_{do}$
2300-2305		Radio 1, Accra, Ghana[1]	4915$_{do}$
2300-2305		Radio 2, Accra, Ghana	7295$_{do}$
2300-2330		Radio Canada Int'l, Montreal	9755na 11730ca 13670na 11940ca 15235sa
2300-2330		Capitol Radio, Abu Dhabi	11985eu 13605eu 17855na
2300-2330		Vatican Radio, Vatican City[mu]	6185$_{eu}$
2300-2330		Kol Israel, Jerusalem	7495$_{na}$ 9435$_{na}$ 11605$_{na}$ 12025$_{na}$
2300-0000		Radio Luxembourg	6090om
2300-0000		Radio New Zealand Int'l	17770$_{pa}$
2300-0000		Radio Pyongyang, North Korea	11700$_{na}$ 13650$_{na}$
2300-0000		Radio Thailand, Bangkok	4830$_{as}$ 9655$_{as}$ 11905$_{as}$
2300-0000	smtwha	RTV Malaysia, Radio 4	7295do
2300-0000		WRNO New Orleans	13720na
2300-0000		WHRI Noblesville, Indiana	9495na 13760sa
2300-0000		KTBN Salt Lake City	15590na
2300-0000		KSDA Guam	15610as
2300-0000		Radio Moscow N. American Svc	9720na 11675na 15500na 15535na 17575na
2300-0000		CFRX Montreal	6070do
2300-0000		Christian Science World Svc	9465na 13625as 15405as 15300af 17555sa
2300-0000		wyfr Okeechobee Florida	5985na 11915na
2300-0000	smtwha	RTV Malaysia, Radio 4	7295$_{do}$
2300-2000		SBC Radio 1, Singapore	5010$_{do}$ 5052$_{do}$ 11940$_{do}$
2300-0000		SLBS, Freetown, Sierra Leone	3316$_{do}$
2300-0000		KTBN Salt Lake City, Utah	15590
2300-0000		WHRI Noblesville, Indiana	9495 13760
2300-0000		WRNO New Orleans, Louisiana	15420
2300-0000		WWCR Nashville, Tennessee	15690
2300-0000		KSDA Guam	15610$_{as}$
2300-0000		Radio for Peace Int'l, Costa Rica	13660 21566 25945 all am
2300-0000		Radio Japan, Tokyo	11735$_{eu}$ 11815$_{am}$ 15195$_{as}$ 15230$_{am}$ 17810$_{pa}$ 21610$_{as}$
2300-0000		Radio Sofia, Bulgaria	11660$_{am}$ 15330$_{am}$
2300-0000		Radio Kiev, The Ukraine	7400$_{am}$ 9750$_{am}$ 15180$_{am}$ 17690$_{am}$ 17720$_{am}$
2300-0000		Christian Science World Svc	9465na 13625as 15405as 15300af 17555sa
2300-0000		WYFR Okeechobee, Florida	5985$_{na}$ 11915$_{na}$
2300-0000		Radio Moscow N. American Svc	9530$_{na}$ 9685$_{na}$ 972$_{na}$ 11735$_{na}$ 11860$_{na}$ 11950$_{na}$ 12050$_{na}$ 15425$_{na}$ 17605$_{na}$ 17665$_{na}$ 17700$_{na}$ 21480$_{na}$
2300-0000		BBC London, England	5975$_{va}$ 7325$_{va}$ 9410$_{va}$ 12095$_{va}$ 15070$_{va}$ 17885$_{va}$
2300-0000		Voice of America, Washington	7120$_{as}$ 9530$_{va}$ 9770$_{as}$ 11760$_{as}$ 11905$_{va}$ 11960$_{va}$ 15185$_{as}$ 15225$_{va}$ 15290$_{as}$ 15305$_{as}$ 15445$_{va}$ 17735$_{as}$ 17820$_{as}$ 17885$_{va}$
2300-0000		UAE Radio, Dubai	11795$_{na}$ 13675$_{na}$ 15320$_{na}$ 15400$_{na}$
2305-2355		Radio Polonia, Warsaw	7270$_{eu}$
2315-0000		All India Radio, Delhi	9535$_{as}$ 9910$_{as}$ 11715$_{as}$ 11745$_{as}$ 15110$_{as}$
2330-0000		Radio Sweden, Stockholm	9695$_{la}$ 11705$_{la}$
2330-0000		Radio Tirana, Albania	6120$_{na}$ 9760$_{na}$ 11825$_{na}$
2330-0000	twhfas	Radio Budapest, Hungary	6110$_{am}$ 9520$_{am}$ 9585$_{am}$ 9835$_{am}$ 11910$_{am}$ 15160$_{am}$
2330-0000		BRT Brussels, Belgium	13675$_{na}$ 13720$_{na}$
2330-0000		Voice of Vietnam, Hanoi	9840$_{as}$ 12020$_{as}$ 15010$_{as}$
2335-2345	smtwhf	Voice of Greece, Athens	9425 11645 12105
2300-0000		CFRX Montreal	6070do
2300-0000		Radio Sofia, Bulgaria	11660am 15330am
2300-0000		BBC London	5975na 6175na 6195eu 7325na 9410eu 9590na 9915eu 12095va 15070va 15260na
2300-0000		Radio Moscow North Am Svc	9720na 11675na 15500na 15535na 17575na
2300-0000		Christian Science World Svc	9465na 13625as 15405as 15300af 17555sa
2300-0000		WYFR Okeechobee Florida	5985na 11915na
2300-0000		Radio Japan, Tokyo	11735eu 11815na 15195as 15230am 17810pa 21610as
2300-0000		Voice of America	6095as 7125as 9770as 11760as 15185as 15215as 15255as 15290as 15305as 17735as 17810as 17820as 17885as
2305-0000		Radio Polonia, Warsaw	7270eu
2315-0000		All India Radio, Delhi	9535as 9910as 11715as 11745as 15110as
2330-0000		Radio Sweden, Stockholm	9695sa 11705sa
2330-0000		BRT Brussels	13655na
2330-0000		Voice of Vietnam, Hanoi	9840as 12020as 15010as
2335-2345	smtwhf	Voice of Greece, Athens	9425na 11595na 11645na
2330-0000	mtwhf	Radio Canada Int'l, Montreal	5960na 9755na 13670sa
2330-0000	as	Radio Canada Int'l, Montreal	5960na 9755na 11940sa 15235sa
2330-0000		Radio Tirana, Albania	6120na 9760na 11825na

PROGRAMS

Sundays

2305 BBC: World Business Review. See S 0530.
2310 Kol Israel: Calling All Listeners. A mailbag program.
2315 BBC: Letter From America. See S 0545.
2325 Kol Israel: DX Corner. Ben Dalfen presents DX news.
2330 BBC: Feature. See S 1401.

Mondays

2305 BBC: World Business Report. The latest news from the markets worldwide.
2310 Kol Israel: Spectrum. A review of developments in science, technology, and medicine.
2315 BBC: Talks. Britain's favorite sport is featured this month on "It's Not Just Cricket," with reviews of books on the subject.
2330 BBC: Multitrack 1: Top 20. The smash singles on the UK pop music charts.

Tuesdays

2305 BBC: World Business Report. See M 2305.
2310 Kol Israel: With Me in the Studio. Inteviews with guests in the Kol Israel studios.
2315 BBC: Concert Hall. See S 1515.
2325 Kol Israel: Faith to Faith. Israel's religions and religious communities.

Wednesdays

2305 BBC: World Business Report. See M 2305.
2310 Kol Israel: Jewish News Review. A look at events affecting followers of Judaism.
2315 BBC: Good Books. See M 0315.
2315 Kol Israel: Living Here. People who have made Israel their home.
2330 BBC: Multitrack 2. New pop records, interviews, news, and contests.

Radio Beijing's Sun Changquing talking with Dr. Rafael Salas, Deputy Secretary-General of the UN.

Thursdays

2305 BBC: World Business Report. See M 2305.
2310 Kol Israel: Jewish News Review. A look at events affecting followers of Judaism.
2315 BBC: Music Review. News and views from the world of classical music.
2315 Kol Israel: Living Here. People who have made Israel their home.

Fridays

2305 BBC: World Business Report. See M 2305.
2310 Kol Israel: Letter from Jerusalem. Arie Haskel presents commentary on topical issues.
2315 BBC: Worldbrief. A roundup of the week's news headlines and developments.
2315 Kol Israel: Thank Goodness It's Friday. A look at Judaism today.
2330 BBC: Multitrack 3. News and releases from the British alternative music scene.

Saturdays

2305 BBC: Words Of Faith. See S 0540.
2310 BBC: Book Choice. See T 1125.
2310 Kol Israel: Spotlight. See S 0010.
2315 BBC: A Jolly Good Show. See T 1515.

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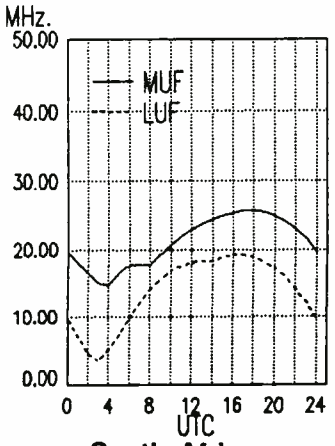
shortwave guide

How to use the propagation charts

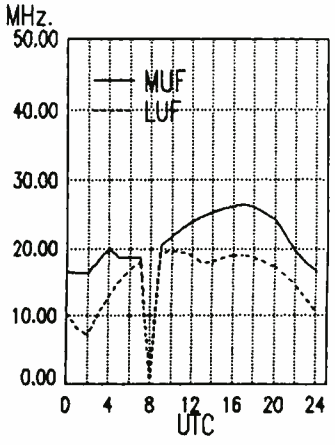
Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location (they are divided into east coast, midwest and west coast of North America). Then look for the one most closely describing the geographic location of the station you want to hear.

Conditions for areas EAST of the Mississippi and ...

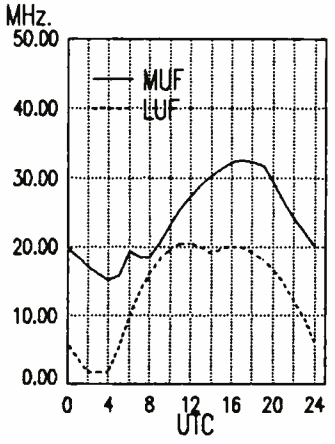
Europe



Middle East



Africa



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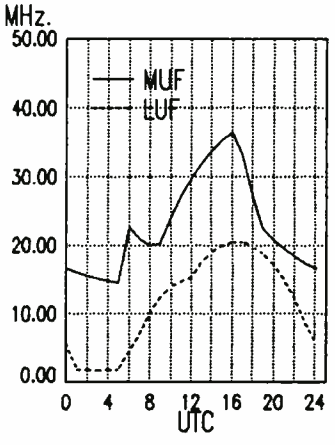
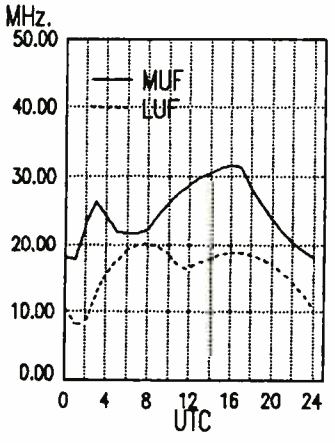


Indian Ocean



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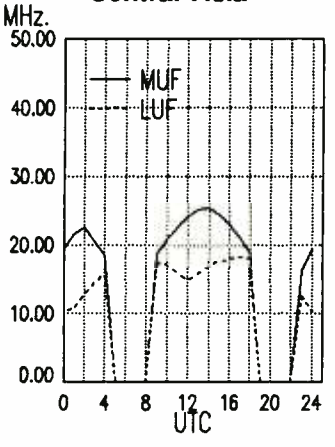
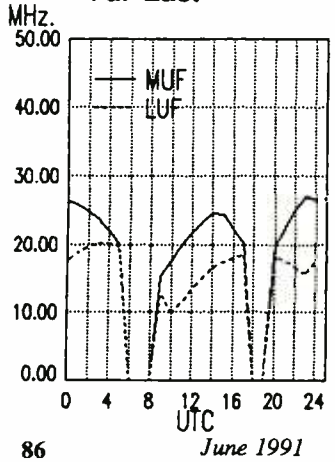
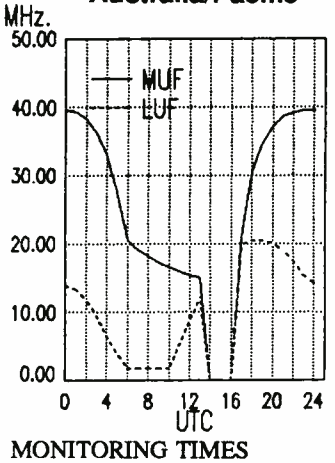


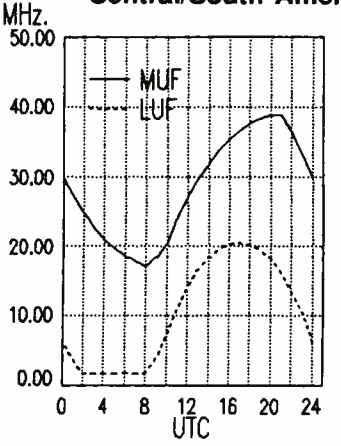
Far East



Australia/Pacific



Central/South America

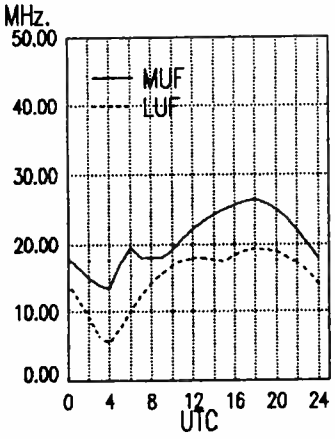


Once you've located the correct charts, look along the horizontal axis of the graph for the time that you are listening. The top line of the graph shows the Maximum Usable Frequency (MUF) and the lower line the Lowest Usable Frequency (LUF) as indicated on the vertical axis of the graph.

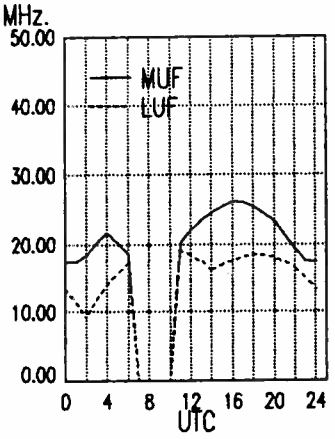
While there are exceptions to every rule (especially those regarding shortwave listening), you should find the charts helpful in determining the best times to listen for particular regions of the world. Good Luck!

Conditions for areas WEST of the Mississippi and ...

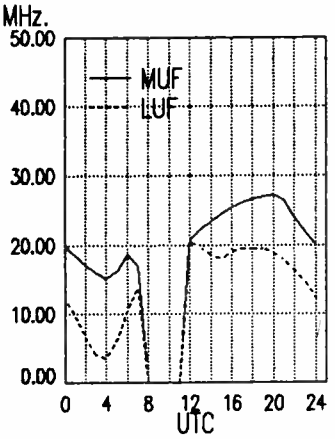
Europe



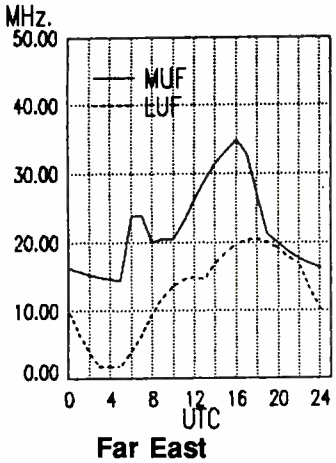
Middle East



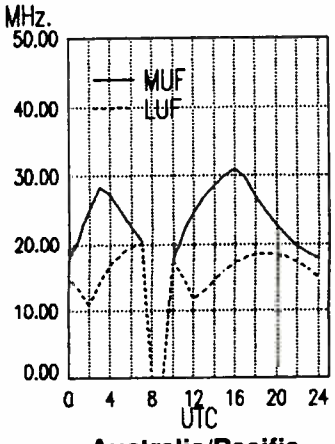
Africa



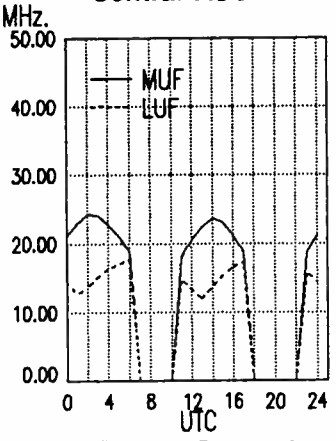
South Africa



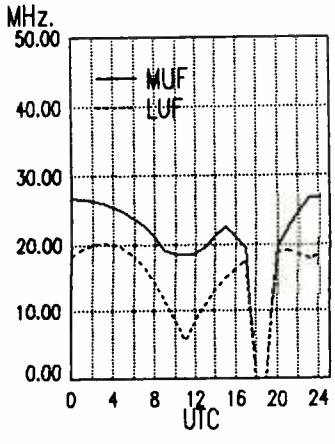
Indian Ocean



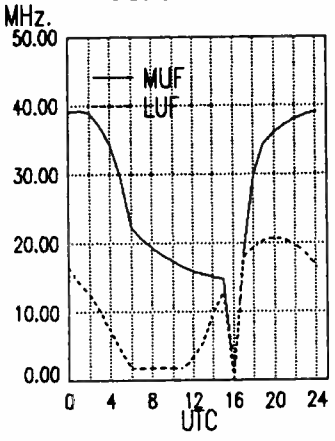
Central Asia



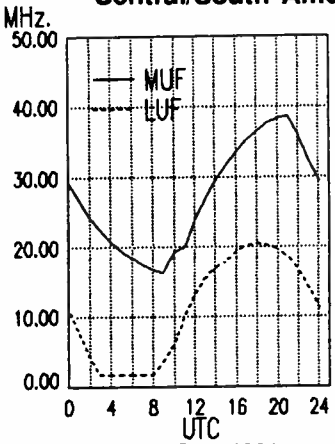
Far East



Australia/Pacific



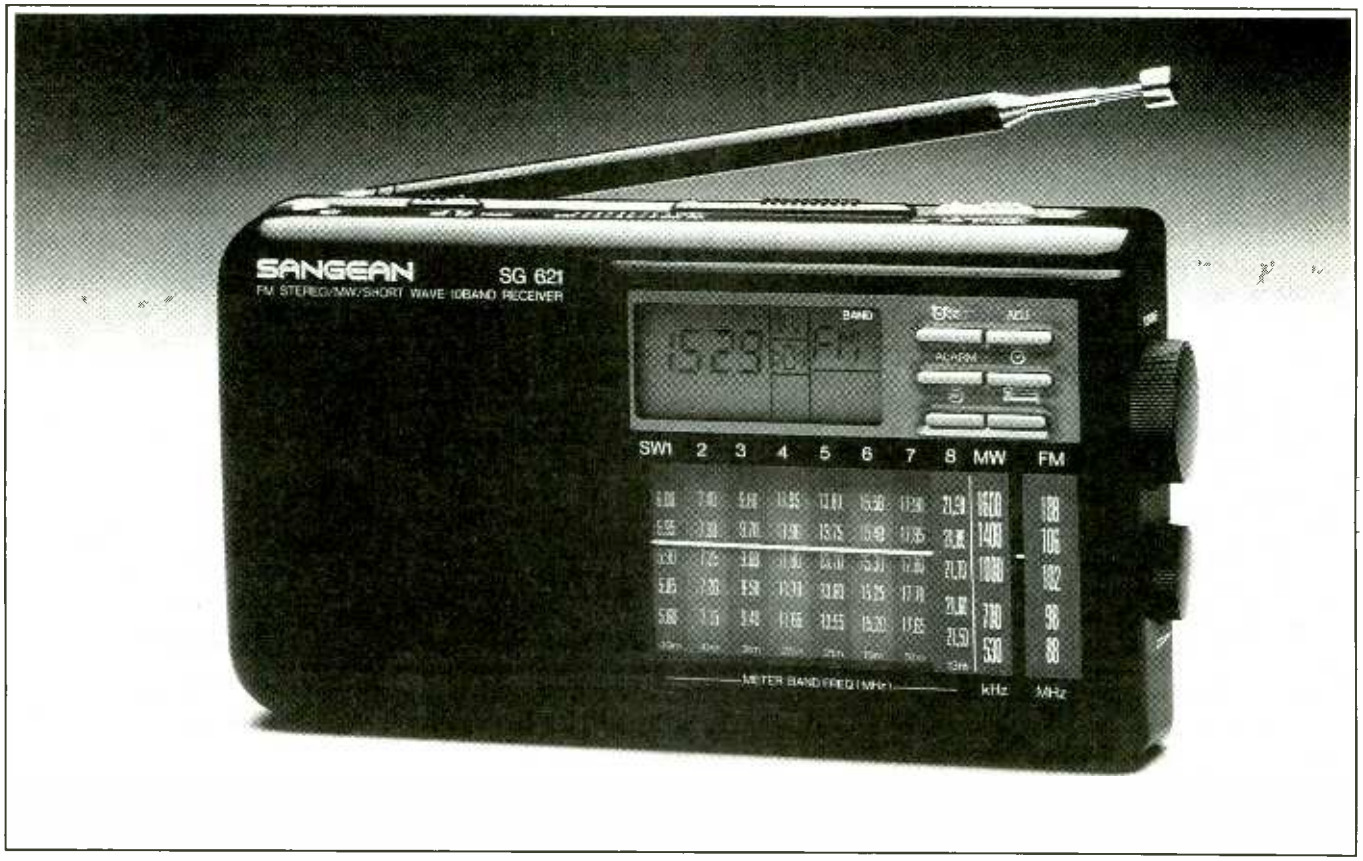
Central/South America



Lawrence Magne

Editor-in-Chief
Passport to World Band Radio

Sangean's Non-Digital SG 621 Digital Portable



Hey, check it out: digital readout in a 119-buck Sangean portable! No, not a Tushmaster PDQ-123 from Honest Abe's catalog house. A real Sangean. The good stuff.

Digital Surprise

But look closer. Sangean's new SG 621 compact portable has an LCD, all right, digital to the core, and to the unwary this might suggest a digital frequency display. But it's just a digital clock. Tuning isn't with precise numbers, but by needle-and-dial with bandspread -- the old way.

How many ordinary consumers are going to realize this before they plunk down money for the radio is anybody's guess. But, this oddity aside, Sangean's new offering is pretty much yet another in the caravan of low-cost look-alike shortwave portables that are more short than wave.

Normal Frequency Coverage for Class

The '621 covers AM 530-1710 kHz, which means full coverage once the expanded AM band takes root in the Americas. FM has the usual coverage, and as a bonus works in stereo when headphones or earpieces -- the latter come with the radio -- are used.

As with most needle-and-dial sets, the '621's shortwave coverage isn't continuous. Instead, it covers the major international bands from 5880-6250, 7050-7500, 9470-9950, 11600-12100, 13550-13950, 15010-15700, 17450-18000 and 21450-22050 kHz. Can't argue with that -- these are the prime chunks -- except that in Europe it's tough to do

without the Beeb on 9410 kHz, or France on 3965 kHz.

Dual-Zone Illuminated Clock

The easily adjusted clock covers two time zones, both in the 24-hour format. (Why, one wonders, can't Asian time "experts" ever get it right: 24-hour format for World Time/UTC, 12-hour with AM and PM for local time?) There's also a sleep-delay and an alarm facility, but no related shutoff, so it's not really a VCR-type event timer. It's useful for trips, though, or for getting up to the strains of Waltzing Matilda.

That clock also comes with a self-extinguishing dial light. Well, a clock light, really, as the little bulb doesn't shed so much as one ray of light onto the tuning dial. So in the dark you can tell the time, but not where the radio is tuned!

In all fairness, the LCD also tells you what band the radio's tuned to. So, light aglow, you may not be able to tell that the radio's around 6175 kHz, but you can tell that it's operating *somewhere* within the 49 meter band. It's spring, the sun is shining, so let's call this half a loaf.

Non-Rotating Antenna

Another half loaf is the antenna. Swivel side-to-side it does, rotate full circle it doesn't. Little portables, like little children, operate comfortably on their backs. Do that with the '621 -- and most other low-cost models -- and the telescopic antenna winds up, like a pencil, flat on the table. The antenna should be vertical for proper FM and shortwave reception.

So from now until you ashcan the radio, you have to rest the '621 on its tipsy little bottom, which makes operating the controls a two-handed exercise. All this hassle to save, what, five cents on the cost of the antenna?

Shortwave Performance About What You'd Expect

Shortwave performance? No surprises here. Selectivity is okay, but somewhat wide. Sensitivity's fairly reasonable, too. And because this is a low-cost single-conversion design, image "ghosts" haunt the sturdiest of ears. Audio, too, is out of the everyday mold for compacts: somewhat distorted, with precious little low-end response. Fortunately, the earpieces do a much better job than the tiny, tinny speaker.

Superior FM

FM stereo also sounds pretty good through those earpieces. But there's no SCA filter, so on some FM stations there are chirps and squeals, plus the AFC is a bit strong and bass response somewhat anemic. But otherwise, superior capture ratio and overall commendable performance allow the '621's FM stage to flush stations out from the thicket better than do most other compact world band radios.

The Bottom Line

You just can't get good world band performance from a radio -- any radio -- for under $120, and the Sangean SG 621 is no exception. But within that low-cost category, the '621 offers no real surprises. Indeed, its lack of digital frequency readout puts it technologically well behind the recently introduced front runners having synthesized tuning.

Still, the '621 has superior FM performance and a nice dual-zone clock. And, being a Sangean, made in Taiwan, it will almost certainly hold up better to the rigors of use than will competing models from the People's Republic of China. For some, these advantages will be enough to make it the model of choice.

mt

PASSPORT'S "RDI White Paper" equipment reports contain virtually everything found during IBS' exhaustive tests of premium receivers and antennas. These reports are available in the U.S. from DX Radio Supply, EEB and Universal Shortwave; in Canada from PIF, C.P. 232, L.d.R., Laval PQ H7N 4Z9; in Europe from Interbooks, 8 Abbot Street, Perth PH2 0EB, Scotland; in the U.K. from Lowe Electronics stores; and in Japan from IBS-Japan, 5-31-6 Tamanawa, Kamakura 247. For a complete list, send a self-addressed stamped envelope to RDI White Papers, Box 300M, Penn's Park PA 18943 USA.

Bob Grove, WA4PYQ

Choosing the Right Scanner

One of the most common questions we receive here at *MT* is "Which scanner is best?" This question is akin to "Which car is best"? There are many considerations.

For example, do you want a hand-held, desktop or mobile scanner? Do you need high memory-channel capacity? Will you wish to monitor UHF military aircraft or commercial FM and TV broadcasting? Is there a price range you must stay within?

Hand-held or desktop?

Don't worry about sacrificing performance when you buy a hand-held scanner; they have the same sensitivity, selectivity and dynamic ranges as their desktop/mobile counterparts. Their speakers are smaller, so audio quality and volume may be compromised. You can always plug in an external speaker, and attaching an outdoor antenna will give you the same coverage as it would with a comparable desktop.

When you're using the battery-operated scanner indoors, it's a good idea to plug in the AC charger/adaptor. While it won't charge the batteries as fast when the scanner is operating as it would when it's off, it will prevent the batteries from becoming discharged during indoor use.

Although an 8-10 hour recharge time is normal, don't worry about overcharging the nicads; memory is a myth. Unless the batteries get overly warm, temporary reduction in capacity ("voltage depression") is restored after one or two discharge cycles. The batteries should last at least three years.

Are some scanners better than others?

Absolutely. Generally speaking, you get what you pay for. The least expensive scanners may have just as good sensitivity and selectivity as the higher priced units, but may lack a frequency readout (display channel number only), have reduced memory capacity (typically 10 or 16 channels), and offer only basic frequency coverage (land mobile low, high and UHF bands).

Let's be specific

So what are the best models? That's easy. Let's look at the fastest sellers; that should tell us something. After all, reputations -- good and bad -- spread fast.

The big three -- Radio Shack, Uniden and AOR -- dominate the market, with Uniden, manufacturer of the Bearcat line, controlling over 80% of sales. But why don't we compare some of these models so you can make a more informed decision regarding your next scanner purchase?

BC200XLT vs. AR1000

Without question, the Bearcat 200XLT is America's premier hand-held scanner choice. With 200 memory channels and 800 MHz coverage as well (less cellular, easily restorable), the 200 seems to be dangling from the hip of every scanner aficionado!

From the factory, the slip-on battery pack is capable of running the radio for several hours; early models had notoriously short charge life because of an incorrectly designed low-battery alarm circuit in the radio which notified the user much too prematurely of the batteries' discharge.

Reprints of the *MT* article which described how to increase battery charge life as well as restore the cellular telephone frequency range which is disabled at the factory are available for $2 and a self-addressed, stamped envelope.

The excellent sensitivity of the 200 is also its downfall in strong signal environments like the inner city (or even the outer city!). Intermod (intermodulation) is severe, causing unwanted signals to be heard all over the place.

This is where the AOR AR1000 has the advantage; not only is it more intermod-resistant, but it has a switchable attenuator to knock signal levels down when necessary. Other features include 1000 memory channels, continuous frequency coverage from 8-600 and 805-1300 MHz (to include shortwave broadcasting, FM and TV broadcasting, and UHF military aircraft).

Step increments are user-selectable; if you want to search or tune in 25 kHz steps for aircraft or 5 kHz for shortwave stations, you can elect to do so.

The 1000 uses conventional, replaceable AA-size nicads (a special battery pack is required for the BC200XLT). A tuning dial allows manual up/down selection of channels or search frequencies.

But there is a down side, too; many disappointed users return their 1000s because of prominent "birdies" -- strong, self-generated oscillations (phantom signals) which block desirable frequencies, stopping the scanning sequence when no actual signal is present.

Squelch settings vary depending upon frequency range and mode; if squelch is set to operate on a mix of modes and frequencies, the weakest signals may not stop the scan sequence.

Frequency readouts of all AR1000s read 5 kHz off. All-channel delay means that you don't have a choice among some channels delaying scan resume and others resuming immediately.

If these idiosyncrasies are acceptable, the 1000 does an excellent job.

BC800XLT, BC760XLT and PRO2006

The Realistic PRO2006, sold by Radio Shack stores and some mail order outlets,

could well be the best scanner ever made. Its 400 memory channels are enough for just about anyone; user-selectable AM, FM wide and FM narrow modes provide additional -- and useful -- functionality. Frequency coverage of 25-520 and 760-1300 MHz (cellular excluded; easily restored) meets most anyone's needs.

Although not as sensitive as comparable Bearcats, this can be a blessing in disguise; it has very little intermod under strong-signal conditions. If there are unusually high signal strengths present, a rear-panel attenuator may be switched in to reduce average signal levels even further.

An external preamp (preamplifier) can be purchased from many retailers to boost signal strengths, although this can cause more intermod. The 2006's off-the-shelf sensitivity is adequate for the vast majority of listening applications, especially in metropolitan areas.

The BC760XLT is a champion among mobile scanners. As tiny as the smallest CB mobile radios, this scanner offers 100 memory channels; pre-programmed search ranges for police, fire, aircraft, maritime, emergency and weather channels; and an optional CTCSS (PL subaudible tone) squelch decoder. Sensitivity is excellent (yes, it suffers from strong-signal intermod).

The 760 comes with an AC wall adaptor and plug-in antenna so that it can double as a desktop unit; its bottom-mounted speaker is quite adequate for either type of installation.

Covering low, high, UHF, aircraft and 800 MHz bands, the 760's cellular frequencies, deleted at the factory, are the most difficult to restore of all the scanners we are comparing. Even so, these signals may be heard (although unlawfully) on their image frequencies 21.7 MHz higher than their assigned (but deleted) frequencies.

The BC800XLT is the oldest among all of the prominent scanners on the market. It is a desktop, the only model from Uniden (or Radio Shack, for that matter) in which cellular frequencies have not been deleted. Cellular frequencies are included on all AOR products which offer 800 MHz coverage.

With 40 memory channels and easy programming, the 800 remains a popular choice among the low-cost competitors. Its excellent sensitivity does invite intermod, but no worse than the other Bearcats. A separate antenna is required for the 800 MHz band; two whips come with it.

So there you have it -- a few tips to make choosing your scanner a little easier.

Doug DeMaw

Power FETs as RF Power Amplifiers

How do power FETs compare to bipolar transistors in RF power service? Do they offer advantages not available when using bipolars? What weak points might we expect when working with power FETs? These are common questions in the minds of experimenters who have not used power FETs. We will consider the pros and cons of power FETs in this month's discussion.

Comparing FETs and BJTs

FET stands for field-effect transistor. BJT is the acronym for a bipolar junction transistor. Outwardly, the two devices look alike, and there are internal similarities. Basically, the BJT has a low input impedance, comparatively speaking. Most RF power amplifiers that use BJTs have an input impedance that may range from three or four ohms to perhaps 15 ohms. This makes input matching to the usual 50-ohm signal source a bit tricky.

FETs, on the other hand, have a characteristically high input impedance which is typically one megohm or greater. Also, a power FET has its input terminal (gate) insulated from the drain-source junction, whereas the input terminal of a BJT (base) is part of the collector-emitter junction. In terms of the input impedance, we may consider a power FET as similar to a triode vacuum tube.

The output impedance of BJTs and power FETs are similar. Both exhibit a low output impedance. This is determined by the collector voltage and the output power. In both situations, the impedance may be calculated by Z (ohms) = Vcc^2 divided by 2Po when working with BJTs, where Vcc is the collector voltage and Po is the design output power.

For power FETs Z (ohms) = Vdd^2 divided by 2Po, where Vdd is the dc drain voltage. Thus, if a power FET is called upon to deliver 10 watts of output power and the Vdd is +24 V, the output impedance is 28.8 ohms.

The lower the collector or drain voltage, the lower the output impedance. For example, a BJT that delivers 10 watts of output power and has a +12-V supply will have an output impedance of only 7.2 ohms. Once again, this tends to make impedance matching to a 50-ohm load a critical proposition, but it can be done.

FET high points

Power FETs are relatively immune to the self-destructive phenomenon known as "thermal runaway," which does affect BJTs. Also, FETs generate cleaner output waveforms (reduced harmonic current) than is true of BJTs. IMD (intermodulation distortion) products are of lower amplitude in FETs.

The FET input and output capacitances change very little versus operating frequency and voltage changes. This makes input and output matching-network design simpler than it is for BJTs. The feedback networks for broadband FET amplifiers are easier to design for this same reason.

FET low points

Power FETs are more fragile, respective to mistreatment, than are BJTs. The gate insulation is very thin and can be punctured instantly by excessive gate voltage. Excessive gate current can also damage the thin layer of metal oxide gate insulation. In a like manner, the drain-source junction can be short circuited quickly from excessive drain-source voltage peaks or spikes.

Power FETs are inherently good devices from dc through the VHF spectrum, owing to their internal structure. The smaller FETs, in particular, if they do not contain built-in protective Zener diodes, will often perform well up to 175 MHz.

This depends in part upon the FET RDs (on) rating, which defines the internal drain-source resistance when the FET is fully turned on or in full conduction. The higher the RDs rating in ohms, the poorer the upper frequency performance. The FET's potential for operating well at VHF makes it prone to VHF parasitic oscillation, and this is another problem area for the designer. More on this later.

Although it may not represent a low point for FET performance, these devices work best at +24 V or greater. The FET efficiency is very poor at +12 V, even though useful power output can be had.

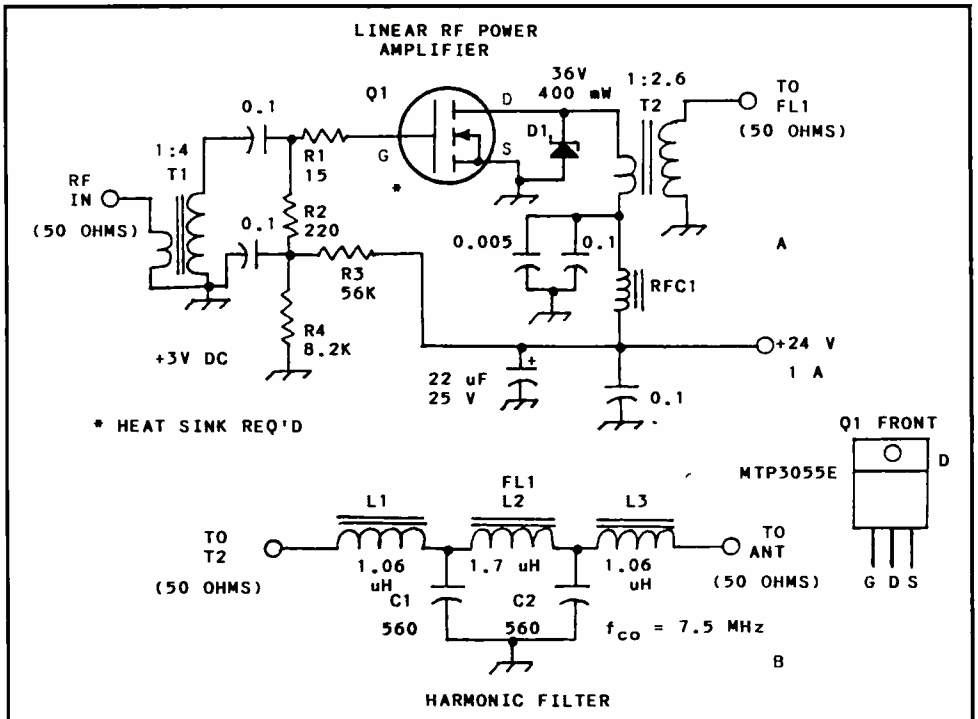


Figure 1 -- Schematic diagram of a practical 15-W power FET RF amplifier for use from 1.8 through 10.1 MHz. Decimal value capacitors are in uF. Resistors are 1/4- or 1/2-W carbon film or composition. C1 and C2 are in pF and are silver mica or polystyrene. D1 is a 33- or 36-V Zener diode. L1 and L3 have 15 turns of no. 24 enamel wire on Amidon Associates T50-2 toroid cores. L2 consists of 18 turns of no. 24 enamel wire on an Amidon T50-2 toroid. RFC1 has 10 turns of no. 24 enamel wire on an Amidon FT-50-43 ferrite toroid. T1 uses 14 secondary turns of no. 26 enamel wire. T2 has three primary turns of no. 24 enamel wire on an Amidon FT-82-43 ferrite toroid. The secondary consists of five turns of no. 24 enamel wire.

Operating class

Power FETs, BJTs and vacuum tubes may be operated in the class A, AB, B and C modes by biasing the devices accordingly. Positive voltage (forward bias) is applied to the BJT base or the FET gate to cause the transistor to draw a resting or quiescent collector or drain current. The amount of current determines the operating class. Class C operation is satisfactory for CW and FM signal amplification. Linear operation (class A, AB or B) is necessary if we are to amplify AM or SSB signal energy. This minimizes distortion of the output waveform (reduced IMD products).

A practical FET RF amplifier

Figure 1 contains the circuit for a class AB linear RF power amplifier that delivers 15 watts of output power in the MF and HF spectrum. R2 determines the amplifier input impedance, which is 220 ohms in this example. This makes it practical to use a 1:4 impedance radio broadband transformer (T1) for matching the amplifier to the 50-ohm driving source.

This resistor negates the otherwise high input impedance of the FET. R1 serves as a VHF parasitic suppressor by deQing this part of the circuit. D1 may be added to work as a peak RF and dc voltage clamp to protect the transistor from excessive voltage peaks. Note: Some power FETS, such as the IRF511, have this device built into the transistor.

T2 is another broadband matching transformer. It matches the 19.2-ohm drain impedance to a 50-ohm load (FL1). RFC1 and the associated bypass capacitors above and below it function as an RF decoupling network to aid amplifier stability. Bypassing is effective over a wide frequency range because of the different values of capacitance used.

A resistive divider (R3 and R4) reduces the supply voltage to +3 to produce gate bias for linear operation. This simple network is adequate because an FET gate draws only microamperes of dc current. Bias regulation is not necessary.

The maximum peak-peak gate voltage for Q1 should not exceed approximately 30. Excessive driving power will cause these limits to be exceeded, and this could destroy Q1. A pair of back-to-back 15-V, 400-mW Zener diodes may be bridged from the Q1 gate to ground for use as a gate-protection clamp.

Figure 1B shows a 5-element low-pass harmonic filter for use between the amplifier and the antenna. This filter ensures that all spurious output energy is 40 dB or greater below peak output power, which is an FCC requirement. FL1 component values are listed for 40-meter operation. The correct values for C1, C2, L1, L2 and L3, for other bands of operation, may be obtained easily from the normalized filter tables presented in *The ARRL Handbook*.

A heat sink is necessary for the Figure 1A amplifier. It should be the extruded-aluminum type with fins. Minimum size is 3 X 3 inches with a height of at least 0.75 inch. Use a thin layer of heat-sink compound between the transistor body and the heat sink.

Some final thoughts

Maximum RF driving power for this amplifier is one watt. Typically, full output can be obtained with 0.5-watt of driving power. This equates to an amplifier gain of roughly 15 dB.

The Motorola MTP3055E FET specified for Q1 is not designed for RF service. It is a switching transistor, but works very well from 1.8 to at least 10 MHz. These transistors are inexpensive, and hence my choice of a switching device. The IRF511 may be used as a substitute.

Many other plastic FET switching devices are also suitable as RF amplifiers. Don't be afraid to experiment. FETs that are designed expressly for RF power amplification are very expensive. I don't recommend them for the experimenter who lacks design experience.

Class C operation may be employed by removing R3 and R4, then grounding the bottom of R2. This will require slightly more RF driving power in order to obtain 15 watts of output power.

Realistic Pro-34 Mods

Several readers have asked recently for modifications for the popular Realistic PRO-34 handheld. The following mods from Grove Enterprises and Lescom will restore the cellular frequencies and also speed up the scan rate. As always, modifying your receiver will likely void your warranty, and neither company assumes any liability in case of damage or warranty cancellation.

Several diode positions are already marked on the board for various worldwide frequency schemes. D9 enables 66-88 MHz coverage (RF realignment is required), but at the loss of 30-54 MHz. D10 enables 896.1125-960 MHz and is installed at the factory. D11 disables 825-855.1 (cellular mobiles) and 870-896.1 (cellular bases) and is installed at the factory. D12 disables 136-146 MHz (disallowed in some countries).

For our purposes, then, only the removal of D11 is of interest since it permits uninterrupted 806-960 MHz frequency coverage with 30 kHz channel spacing.

The following procedure is relatively complicated and should not be attempted by anyone unfamiliar with soldering small circuit boards. A complete service manual (stock no. 20-135/9135) for the PRO34 is available from Radio Shack.

1. Remove the battery cover and battery, four black screws from the rear cover, and volume and squelch knobs.

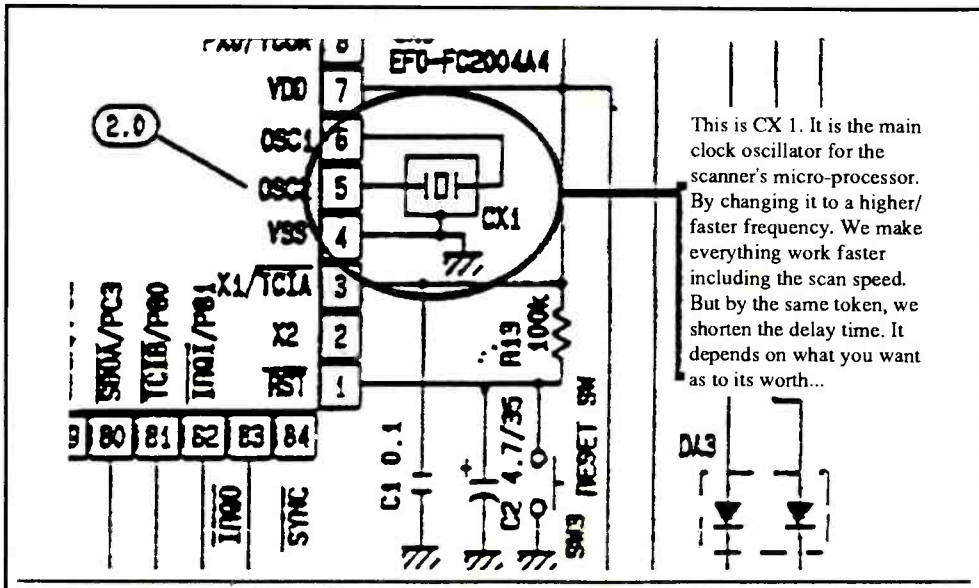
2. Remove the rear cover, lifting back and upwards to clear the control shafts (do not remove belt clip or circuit board screws).

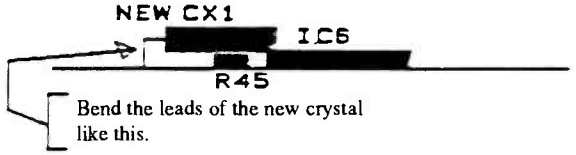
3. Unplug the brown volume control connector (green, yellow, black cable) and white squelch cable connector (white, black, red cable) from the linear circuit board.

4. Unsolder the ground lead from T111 (at the corner of the linear circuit board above the external power connectors). Unsolder the two power switch leads from the back of the volume control. Unsolder the antenna connector center pin and ground leads from the linear circuit board.

5. Unscrew the four combination screws that hold the linear circuit board and held the rear cover screws. Grasp the linear circuit board at the top and lift it straight away from the front case, unplugging the 16-pin connector.

6. Remove the three screws holding the metal frame assembly which held the linear circuit board to the front panel. Unplug the red-black power lead and lay the frame aside (it is still connected to the battery contacts).





Bend the leads of the new crystal like this.

Get it as close to the board and components as practicle. Be sure that the case is insulated from everything it comes in contact with.

Courtesy of LESCOMM

7. Locate diodes D9-D12 on the volume control side of the logic circuit board under T1; D10 and D11 are marked. Clip one lead of D11, separating the gap slightly (it may be resoldered later if desired).

You are now ready to go on to the speed mod. Or if you don't plan to perform that modification, you are ready to reassemble the board by reversing the disassembly procedure outlined above.

PRO34 SCAN SPEED MODIFICATION

After you have completed steps one through seven above, locate the little white block on the logic board labeled CX1. This is a 2 MHz ceramic resonator. Lift out the Logic Board and CAREFULLY...CAREFULLY! remove the resonator from the Logic Board.

The center lead is connected to ground through a plated through hole on the opposite side of the board. Because of this, it must be heated longer than the other two. But be careful not to overheat the board.

Go down to your local Radio Shack and purchase a color TV crystal, part number 272.1310 ($1.39). This is a 3.579545MHz crystal. This will give almost a 80% increase in scan speed. Or you can purchase a 4.000MHz crystal for a 100% increase, but you must insulate the crystal base with heat shrink or electrical tape.

Install this crystal as shown in the illustration. You need only use the outside two holes. Now reassemble reversing the disassembly instructions above. Our thanks to Lescom (1116 Stone Street, Jacksonville, AR 72076) for the speed mod tips and diagram.

A Note of Thanks

This month we say good-bye to Rich Arland as editor of the Experimenter's Workshop column. In the past two years he has educated and entertained our readers and passed on the many scraps of knowledge and experience you have submitted to him. Thanks, Rich for spending some time with us.

The new column editor will be needing your input as to desired topics, technical questions that have always puzzled you, and solutions and mods that have worked for you (quote the source if it didn't originate with you). As always, enclose an SASE if you expect a reply.

W. Clem Small, KR6A, CET

A New Tower Of Babble?

Telecom Tower may be the most interesting and complex antenna structure in the world. Or so it would seem according to some material sent to me by *Monitoring Times* reader M.L. Cauthon III. Discussing this tower, M.L. says that: "The Telecom Tower is located in Canberra, Australia, and is a premier tourist attraction in that city. It is common to add antennas to high rise revolving restaurants, but I think this structure is unusual in that the restaurant has been added to the antenna."

The Tower of Many Voices:

The Telecom Tower antenna, which pierces the ether to a dizzying height of 195.2 meters (over 600 feet), is actually a giant antenna mast with many, many antennas, numerous rooms, galleries, and platforms arrayed on and integrated into its construction. Its antenna complement includes radio relay antennas, mobile and paging base station antennas, FM broadcasting antennas, UHF and VHF TV antennas, and "radio bearer antennas."

At various locations within the antenna tower are to be found rooms for transmitting apparatus and various associated operating, testing, and maintenance equipment, viewing and work platforms, and windowed galleries for viewing the surrounding countryside.

Add to this the revolving restaurant, with its spectacular view of all of Canberra, and you have one very unusual and impressive antenna structure.

Now A Bit More Down to Earth:

It seems safe to say that none of us *MT* readers will ever afford at $16 million such a magnificent antenna tower at our listening posts, but we can still put up some great skywires that will bring the stations we want into our receivers. So, let's talk a bit about some ways we can
make it easier to get those antennas mounted.

First, a few tips that have come my way over the years concerning making inexpensive antenna insualtors. for antennas that won't be

staying up long, dry varnished wood is actually okay. But it will weather quicker than some other materials like glass, or even plastic or fiberglass. Strips of heavy plastic or fiberglass with a hole in each end are often satisfactory insulators.

The Insulator With the Hourglass Figure:

Another tip that I have heard more than once uses a glass or plastic bottle with an hourglass figure, like a classic Coke® bottle. Around the center, or waist, of the bottle, make a loop with the end of the antenna. Make it fit almost tight. Then make a similar loop around the middle of the bottle with the cord or light rope which supports the antenna. When the rope is tied to one antenna support, such as a tree, and the antenna pulled out to another support, the two loops slip slightly apart and yet are too small to slip over the large ends of the bottle.

I've heard that it works well, but I'd be careful; if your rope breaks, someone could get conked on the head with a bottle. Maybe that means that a small, light plastic bottle would be best for this one.

Up, Up, Up and Away:

Getting your antenna guy rope up over the desired tree or even over a high building can sometimes be a problem. Clever radio experimenters and hams have often been known to use a bow and arrow, or a slingshot to get a string over things like tall trees.

The secret is to attach a thin fishline to the arrow or weight which you shoot over the tree. Then use the string to pull up a small rope, and you can use the rope to pull up your antenna. It may take a few tries, but it is worth it. Remember to watch out for electrical power lines and don't put the arrow or weight through a window.

Some Reader Feedback:

MT reader Brian Jones of San Antonio, Texas, writes that when he was recently on a trip to Costa Rica, he found a use for one of the "Antennas for the Simple-Minded" from one of our past "Antenna Topics" columns. Since he was staying on the top floor of a building, he tried just stringing a wire around the floor as an ar·nna. Results were poor.

He then tried the "Simple Minded" technique of hooking a wire from his receiver's antenna input to the finger-stop on the telephone dial. It didn't work.

Being the experimental kind, Brian didn't give up, but as he says: " . . . took the wire and wrapped it around the phone 10 or 15 loops." This is similar to the "Simple Minded" foil under the phone trick. Brian reports that the looping technique worked pretty good. So, a little ingenuity and experimenting can often provide a way to get a working antenna, even under adverse conditions.

MT reader Harlan Crew of Mena, Arizona, writes in to share a tip that he used in making

the "Antenna Topics" (Nov. `90) five-eighth wave ground plane antenna. He used TV rabbit ears elements as elements for that antenna. He says this allows him to easily tune the antenna to various bands. Sounds like a good idea, Harlan. Thanks.

RADIO RIDDLES:

Last Month:

We discussed space diversity, polarization diversity, and frequency diversity. All of these types of diversity give the receiving station a better chance of receiving the information contained in the desired signal. In closing then, I asked you to name another kind of diversity reception that has many relatives including SITOR, AMTOR, packet and the CW prowords QSM and QSZ.

Did you guess this one? Well, it is "time diversity," something that has been with us since the beginnings of wireless, after a fashion at least.

Time diversity is accomplished by transmitting the same information more than one time, giving the receiving operator a better chance to copy its content than when that information is sent only once. Thus, when a ham radio operator asks for the station with which he/she is talking to repeat its last transmission, he/she is requesting a rudimentary sort of time diversity.

On the CW portions of the bands, the prowords (procedure words) QSM and QSZ request the same sort of thing. Shortwave broadcast stations also often use a sort of time diversity when they broadcast the same program at morethan one time during the day, to take advantage of varying propagation conditions.

With the more sophisticated transmission modes of SITOR, AMTOR, and packet radio, the repeating, when needed, is automatic with the software and hardware, no operator request is needed. But in each of the examples cited, the idea is to increase the chances of getting the information through correctly by transmitting it more than once. So, all things considered, diversity reception in its many forms is a great asset to radio communications.

This Month:

There was once a dentist named Loomis,
whose name may not mean
too much to us.
But in days long gone by,
He flew a kite in the sky,
and gave the word "antenna" to us.

What is Loomis' given name and why is he cited in many serious historical works on the history of radio? Hint: It is not primarily for giving us the word antenna.

Get a solution to this riddle, and much more, in your next month's "*Monitoring Times*." Till then, Peace, DX, and 73.

Interested in Writing for MT?
Send for the Author's Guidelines

ask bob

Bob Grove, WA4PYQ

Q. I have an old Hallicrafters SX-99 and a Lafayette HE-30, neither of which is capable of single sideband reception. Is there an external adaptor that I can use to hear SSB? (Frank Gunnder, Jeannette, PA)

A. Both of your sets are capable of SSB reception without an adaptor. Adjust the main tuning dial until the SSB signal is strongest, switch on the CW or SSB mode and adjust the BFO control slowly until the voice becomes intelligible. If this doesn't work, the set needs alignment.

Q. Is there any way to reduce the "popping" interference on my shortwave receiver caused by electric fences? (Verlin Shinn, Hidden Hills, CA)

A. In a word, no. The spark generated by the contact in the electric fence charger is rich in harmonics which spread far into the shortwave range. Good communications receivers (ICOM, Kenwood, Yaesu, JRC, Drake, Ten Tec, etc.) have noise limiters or blankers which are optimized to reject pulse noise.

Try moving the wire antenna in different directions while listening to the interference in an effort to place the signal(s) from the worst offender(s) in a null (minimum pickup). This would normally be off the end of the wire.

There are sophisticated phasing devices which utilize two antennas and a phasing device to null out the interfering signal, but at their cost, you might as well buy a better receiver.

Q. Why does our local police department use four channels in the 800 MHz band which rotates with voice and a loud tone? (Larry Hoffer, Milwaukee, WI)

A. You are hearing a trunked system; the loud tone is a data channel which automatically tells the base and mobile units which channel they will be switched to next. Trunking helps even out the "loading," or amount of use, each channel sees so that one channel won't be tied up while another lies dormant.

Q. I need lengths of steel rod such as used on whip antennas. Where can I find it? (Robert Kenyan, Tombstone, AZ)

A. One prominent industry source, Maryland Specialty Wire (Cockeysville, MD), only processes orders in the 300 pound range--a little big for home experimenters wanting a whip! You may wish to try a welder's supply house; stainless steel rods should be available in appropriate diameters. Some hobby supply stores may have it as well.

Q. What is the future of AM stereo on shortwave? (Mark Hansen, Sunnyvale, CA)

A. Bleak. Even on medium wave AM it is considered a novelty, an experiment in bad audio. Shortwave, with its attendant interference, would be even worse. There aren't any stations using it there, and there aren't any receivers which would hear it if there were.

Q. Recently I heard telephone conversations near 87 and 108 MHz on my car FM, sometimes both sides, other times only one side. Often there would be more than one going on at once. Were these cellular telephone repeater harmonics? (Puzzled in Cincinnati)

A. Did most of the conversations stop in mid-sentence? That would indicate cellular. If they lasted for several minutes, it would have been conventional mobile telephone (152/158 or 454/459 MHz) or cordless telephones (46/49 MHz).

It is likely that the phenomenon was intermodulation-related ("intermod") from strong-signal overload in your receiver since harmonics of these services wouldn't fall in the FM broadcast band. Were you within a couple of miles of a telephone exchange building with tall antenna towers? That would cinch it!

Q. I occasionally see a frequency listed as 5.000 MHz, then the same service shown as 5000.0 kHz. How can they be the same frequency? (Terry Weddle, Fort Scott, KS)

A. Just as we can give a person's height as 6.0 feet or 72.0 inches, radio frequencies can be stated as kilohertz (thousands of vibrations per second) or megahertz (millions of vibrations per second).

In your example, 5000 kilohertz means 5000 thousands; this is the same as 5 million (5 megahertz).

Q. What are the new 800 MHz cordless telephone frequencies? (Many Inquiries)

A. We went to the FCC for this one. According to John Reed, who authored the Part 15 FCC rules and regulations, there is a frequency pool from 902-928 MHz which can be used for a variety of services. Low power cordless phones compete (in order of priority) with:

- ISM (industrial, scientific and medical) equipment like diathermy machines and microwave ovens;
- Military radar
- Airport wind shear detectors
- AVM (automatic vehicle monitoring) equipment (PacTel will shortly be in 100 major cities)
- and amateur radio (southern California already has many repeaters there).

Q. I recently paid nearly $500 for a Uniden MR8100 scanner, but returned it after I found that it suffered from intermod. Don't two-way-grade radios have better performance than the average scanner? (Bill Reuter, Swanton, OH)

A. Yes, two-way radios do, but the MR8100 is a scanner with improved functional design, not a two-way-grade receiver with better dynamic range or restricted frequency coverage (the real culprits here) like the two-ways have.

Q. Why does the 1991 Dodge "Spirit" owner's manual warn against using a magnetic-mount antenna for trans-

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 question along with a self-addressed, stamped envelope (no telephone calls, please) in care of MT.

mitting? (Richard C. Meese, Marquette, MI)

A. Good questions. My guess is that they are concerned about their liability if improper antenna grounding resulted in radio-frequency interference with the electronic control unit for the vehicle.

***Q.** I have a Radio Shack 43-143 memory tone dialer which is painfully slow; can it be speeded up? (David H. Ramsay, Londonderry, N. Ireland)*

A. If you are game for an experiment and handy with a soldering iron, you might try substituting a higher-frequency time-base crystal (probably a ceramic resonator in your unit). If it doesn't work, put the other one back!

***Q.** I recently ordered a PacTel CS-8410 cordless telephone from Crutchfield, but sent it back after I discovered that it radiated all sorts of signals which interfered with scanning, even when switched off! Is this typical of cordless phones? (Tom Gabriel, North East, PA)*

A. It's typical of some cordless phones. I'm afraid that sensitive, wideband receiving equipment like a good scanner installation is not of concern to most manufacturers when they design their products. Just so long as they meet FCC part 15 (incidental radiation) specifications, they are under no further obligation.

***Q.** Why does my Uniden BC50XL hand-held scanner go through batteries so fast? I use only fresh alkalines, yet within 90 minutes or so the low-battery beeper starts. (Seamus Ahern, Oak Park, IL)*

A. Premature low-battery alarm is endemic among the Uniden portables. There is general plenty of battery life left after the alarm goes off in the BC50XL and the BC100/200XLT models as well. *MT* has had modification articles in the past to correct the problem.

Thanks to all the faithful readers of "Ask Bob" who responded to Kevin Neal's quest for a base diagram of the old 1629 "seeing eye" tube in a previous issue. Judging from the number of people who sent in base diagrams and specifications, Kevin now knows more about the old 1629 than most engineers did when it gained its popularity a half century ago!

A comprehensive list of questions and answers regarding monitoring may be found in Bob Grove's "Scanner and Shortwave Answerbook," $12.95 plus $3 shipping from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902.

LETTERS

continued from page 3

reflects the feelings of about 30 others in the Scranton, Pennsylvania, area. Being disabled, he finds CB the only outlet that "keeps him from going nuts with boredom," but that the 40 regular channels contain too much foul language to be used, especially in front of his three children. He maintains he and his friends would "gladly pay a $50 license fee to get regular CB channels cleaned up rather than $60 to get the extra [illegal] channels."

"If a petition would help we would do it," say Magnum, " but it seems the FCC doesn't care! Can anyone help?"

While we don't condone resorting to illegal channels (even though Magnum and his friends claim they don't run extra power and avoid interference with other services), his S.O.S. is a common one heard these days in reference to the citizens band. Has any community had any success "cleaning up" the legal channels? We've heard one man's story; We'd like to hear *your* story.

Harley Braidman, Head of the English News section of Kol Israel, wrote *MT* after reading May's profile of reporter Connie Lawn. He remembers the Yom Kippur war and the trying circumstances under which they broadcast during that time. While many of the staff were drafted into the army, the others were given requisition orders to stay on the job, and worked round-the-clock shifts to keep Kol Israel on the air. "Connie Lawn did an excellent job as our reporter in Washington," says Harley, but she certainly did not produce the entire English section. As Connie herself remarks, "That would be an impossibility."

Braidman pointed out the distinction between "government" and "state." "Kol Israel is not a 'government-owned station'; it is a public, state corporation."

Connie Lawn goes on to explain: "Kol Israel is not a propaganda arm of the Israeli government, no more than the BBC is one of the British government. All the government-licensed stations around the world get their money from license fees or ads. The government exercises no control over their content, except in the case of military matters which jeopardize the national security. That would be like saying NPR is a propaganda arm of the U.S. Government! These are independent stations, often highly critical of their governments."

Lawn also adds, "The article gives the impression I take soundbites off of CNN. That is certainly not true. When we take interviews from CNN and the networks, we always attribute them. For example, we say, 'Vice President Quayle, as interviewed on CNN.'"

She also states that David Eppel, who hired her for Kol Israel, was at the time head of the English News section in Jerusalem, rather than Washington correspondent, and that she reports for Australian Radio News, not for the Australian Broadcasting Commission. Thanks for the clarifications, Connie.

Earlier this year, Canadian Minister of Communications Marcel Masse assured John Dunmire of Boulder City, Nevada, that although "The Canadian Broadcasting Corporation has informed the Government of Canada that it lacks the resources to continue the short-wave service ... RCI will continue to broadcast around the world while a permanent solution is being sought."

Apparently they have kept their promise, but according to *MT* columnist James Hay, you never know what you'll hear when you tune in. One time he thought he accidentally tuned in the BBC as he listened to a guided tour of the London zoo. Or wondered what use someone in Africa made of daily traffic reports from Montreal. "As It Happens," currently in progress, serves as a time filler, often entering or being cut off mid-word. In Hay's opinion, "Radio Canada International has fallen from second place next to the BBC to somewhere below Radio Bangladesh."

It's heartening to know that Canadians like James Hay and Wojtek Gwiazda care as much about what is happening to their broadcasting system as do international listeners. Larry Weil of Salem, New Hampshire, was surprised to find the Ottawa *Citizen* on sale in Florida while he was there on vacation. Two outraged editors filled their columns with testimonies from listeners worldwide on the part RCI has played in their lives.

"Today," says reporter Dave Todd in one article, "RCI's lone representatives in the nation's capital ... occupy what was formerly a storage closet at the back of the CBC's suite of offices in the Chateau Laurier Hotel."

D. Schoales, another Canadian citizen, says he found the RCI article "interesting both because I'm a SWL and an employee of the 'People's Network.'" Schoales enclosed the above "No CBC Cutbacks" sticker.

"We have all had to deal with the hardships of the cuts," he continues. "Every corner of the CBC has been affected and a great many relationships have had to be dissolved all across the network (TV and Radio). The world of SWL will go on whether RCI has a signal in every corner of the world or not. And please -- make no mistake about it -- RCI will return to its former self."

We certainly hope so, "D". But meanwhile, those of us who don't have a vote

in Canada and to whom the broadcasts were directed, can tell Prime Minister Brian Mulroney (House of Commons, Ottawa, Canada) that we *were* listening.

If we ever doubted that *MT* readers respond (and we didn't), proof to the contrary arrived in a thanks to all of you from Patrick Kerrigan of Operation Desert Storm, who received several letters from the U.S. and Canada after our mention of him in "Letters."

Patrick expressed surprise that the U.S. had sold out of shortwave radios; "I thought everyone was at home watching CNN, the best reporting on the war, at least according to Mr. Cheney."

In spite of monitoring "several radios, one marine band, one hi-band VHF, which was our SCUD missile and anti-terrorist alert net, an army field FM radio, and army field HF transceiver," Patrick really missed not being able to listen to shortwave radio, or his scanner, or even news from home on the VOA! We trust you are now safely home, Patrick, and *that's* the best news.

The use of computer programs to enhance radio monitoring is growing by leaps and bounds. Your response on the 1991 survey indicated it is a field in which *Monitoring Times* could be of help, and we are looking into a beginners column on software.

Meanwhile, for those of you who use a database program from Symantee Corporation called Q&A, we received a special offer from one *MT* reader. Charles Bolland, KA4PRF (P.O. Box 18402, West Palm Beach, FL 33416-8402) is offering his shortwave broadcasting database.

Send him $5 for cost of mailing and the disk, and he promises to send you the result of hours of "pleasurable research and processing" by return mail. Thanks, Charles, it could be an enormous time saver. By the way, the Q&A Database program, which Charles recommends as very easy to use, can be purchased from mail-order companies for around $219.

Thanks to everyone who has written to us in recent weeks; we're always interested in your ideas, input, and opinions. See you next month with some more good monitoring times!

-Rachel Baughn, Editor

CONVENTION CALENDAR

Date	Location	Club/Contact Person
June 1	**Knoxville, TN**	RAC of Knoxville/ Steve Fritts WA4GZE 400 Tobler Ln, Knoxville, TN 37919 Location: Knoxville Convention Center, downtown Knoxville, 9am-5pm $4 advance tickets, $5 at door.
June 1	**Columbia, MO**	Central MO ARA/ Jesse Brown WM0Y 1915 Blue Ridge Rd, Columbia, MO 65202
June 2	**Tamaqua, PA**	Tamaqua Transmitting Soc & Anthracite Rptr Assoc./Allen Breiner Sr. W3TI 212 Race St, Tamaqua, PA 18252
June 2	**Manassas, VA**	Ole Virginia Hams/ Ken Moan KM4UH PO Box 1255, Manassas, VA 22110
June 2	**Salina, KS**	Central Kansas ARC/ Jim McKim W0CY 1721 Glenn, Salina, KS 67401
June 2	**Princeton, IL**	Starved Rock RC/ Pete Jacobsen AA9R 19 Briarcliff Dr, Spring Valley, IL 61362
June 2	**Queens, NY**	Hall of Science ARC/ Stephen Greenbaum WB2KDG PO Box 131, Jamaica, NY 11415; (718) 898-5599 Location: NY Hall of Science parking lot, Flushing Meadows Park, off 47th Ave & 111th St, 9am-3pm, $4 donation, talk in 445.175 rptr/146.52 simplex
June 8	**Winston-Salem, NC**	Forsyth Co ARC/ Jim or Dolly Rodgers PO Box 11361, Winston-Salem, NC 27116 (919) 760-2493 Location: Benton Convention Center, 9am-5pm
June 8	**Loveland, CO**	Loveland Superfest/ CO assoc of DXers* Location: Larimer Co Fairgrounds; 8am - ??
June 7-9	**Arlington, TX**	West Gulf Div Conv/ John Fleet WA5OHG PO Box 2502B, Dallas, TX 75225
June 9	**Willow Springs, IL**	6 Mtr Club of Chicago/ Joseph Gutwein WA9RIJ 7109 Blackburn Ave, Downers Grove, IL 60516
June 9	**Lancaster, NY**	Lancaster ARC/ Nick Mueller WA2CJJ 5645 Genesee St, Lancaster, NY 14086 Location: Elks Club Hall, Rt 20-Broadway across from Lancaster PO, admission $4 person, Phone (716)681-6410/683-8880/894-0343, talk 146.550 simplex/224.640 rptr
Jun 14-15	**Albany, GA**	Albany Amateur RC/ John Crosby K4XA PO Box 1205, Albany, GA 31702
June 16	**Kinston, NC**	Down East Hamfest/ Larry Schwarz 118 River Bluff Apts, Greenville, NC 27834 Location: Lenoir Country Fairgrounds, Hwy 11S off Hwy 70, admission $5.00, 9am-3pm, talk in on 146.085/146.685 simplex
June 22	**Lempster, NH**	Conn Valley FM Assoc/ Conrad Ekstrom WB1GXM PO Box 1076, Claremont, NH 03743-1076; (603) 543-1389 Location: Goshen-Lempster Coop School Gym, Rt 10, Lempster, 10 mi so of Newport, NH, 25 no of Keene, 7am-2pm, $1 admission, talk-in 146.16/76.
June 29	**Glenwood Spr, CO**	CO Assoc of DXers* Location: Glenwood Springs, CO Mountain College
June 30	**Wilkes-Barre, PA**	Murgas ARC/ Robert Nygren WA3YON RD1 Box 134-6, Sweet Valley, PA 18656
July 6	**Oak Creek, WI**	So Milwaukee ARC/ Robert Kastelic, PO Box 102, So Milwaukee, WI 53172-0102 Location: American Legion Post #434, 9327 S. Shepard Ave, Oak Creek, WI 53154, 7am-2pm, $4 admission, talk in 146.580 simplex
Jul 12-13	**Maplewood, MN**	Amateur Fair/ Keith Mobarry, PO Box 26331, St. Paul, MN 55126 (612)653-9999. Location: Aldrich Arena, 1850 White Bear Ave, Maplewood, MN, Fri 6pm-10pm, Sat 6am-2:30pm, $5 admission.
Jul 13-14	**Woodland Pk, CO**	Mountain ARC Swapfest/ CO Assoc of DXers* Location: Red Rocks Campground, 8am-4pm both days.
July 14	**Downers Grove, IL**	Dupage ARC/ Edwin Weinstein, WD9AYR, 7511 Walnut Ave, Woodridge, IL 60517
July 20	**Wellington, OH**	Northern Ohio ARS, Darlene Ohman, KA8VTS, 4122 Bush Ave, Cleveland, OH 44109
July 20	**Union, ME**	Maine Hamfest Assoc/ Rod Scribner, KA1RFD, 19 South Grove St, Augusta, ME 04330, (207)622-9197. Location: Union Fairgrounds, Route 17, 8am-2pm, $3 admission.
July 21	**Golden, CO**	Denver Radio Club Hamfest/ CO Assoc of DXers* Location: Jefferson Cty Fairgrounds, 8am to ??
July 21	**Berwyn, IL**	Amat Cross Link Rptr Assoc/ Gary Myk, KA9SUN, 6520 W. 28th, Berwyn, IL 60402
July 27	**Texas City, TX**	Tidelands ARS/ Carl (Bill) Steele, WA5WVP, PO Box 892, Texas City, TX 77592
July 27	**Eau Claire, WI**	Eau Claire Hamfest Assoc/ Liz Searing, N9EQR, 1129 McKinley Road, Eau Claire, WI 54701, (715)834-1303.
Jul 27-28	**Atlanta, GA**	Georgia State Convention/ Verne Fowler, W8BLA, 4343 Shallford Rd Ste E6, Marietta, GA 30062.
Jul 27-28	**Oklahoma City, OK**	Central Oklahoma Radio Amateurs/ CORA Ham Holiday 1991, PO Box 95942, Oklahoma City, OK 73143-5942. Location: Oklahoma State Fair Park, Arts & Craft Bldg. 8am-??, $8 admission, talk in on 147.03/63 simplex.
July 28	**Baltimore, MD**	BRATS Hamfest/ Mayer D. Zimmerman, W3GXK, PO Box 5915, Baltimore, MD 21208, (301)583-9147. Location: Maryland State Fairgrounds, York Road off I-83 and I-695, Set-up Sat 2pm, Sun 6am, talk in on 147.03 simplex,/224.96 rptr

*Colorado Assoc of DXers, PO Box 22202, Denver, CO 80222-0202 for info

Monitoring Times is happy ro run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to: Monitoring Times Convention Calendar, PO Box 98, Brasstown, NC 28902.

INDEX OF ADVERTISERS

When readers are in the market, they look here to find your ad ... Will it be here?

We'd like to hear your comments, opinions, and experiences concerning the world of radio. Please understand that personal replies are not always possible.

Letters should be addressed to ***Letters to the Editor,*** *Monitoring Times, P. O. Box 98, Brasstown, NC 28902. Please include your name and address (may be withheld at your request).*

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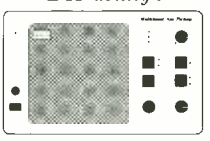

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Closing Comments

Is Shortwave Broadcasting Doomed?

Recently there has been considerable discussion about the "demise" of shortwave as a communications medium. Budget cuts at the Canadian Broadcasting Corporation have effectively cut Radio Canada International off the air. Many utilities and broadcasters alike have moved to satellites. Millions of Americans listen to satellite transmissions direct with their home TVRO (television receive only) dish terminals.

Does this success story of the multi-billion-dollar satellite industry herald the extinction of shortwave as a communications medium? Do these signals from space ring as a death knell for nearly a century of high frequency broadcasting?

There is certainly no indication of that -- there have never been so many signals on the high frequency 3-30 MHz spectrum as there are now. While the sunspot peak accounts for some of the din, the fact remains that the military, a prime user of satellites, has reaffirmed shortwave as a prime backup for their critical communications. They have billions of dollars already invested, and utilities listeners who monitored Air Force and Navy communications during the Iraqi conflict will attest to the amount of HF traffic.

The same is true for international broadcasters. While many prime SWL favorites -- Radio Moscow, Deutsche Welle, VOA -- have already implemented satellite broadcast distribution, they have hardly abandoned shortwave. To the contrary; perhaps the hottest item on the agenda of the 1992 World Admininstrative Radio Conference (WARC) in Geneva is the annexing of yet more spectrum for shortwave broadcasting! Does this sound like HF is doomed? Hardly.

Satellites will unquestionably come into their own for international broadcast distribution; a consortium is presently planning to launch such a network, perhaps as early as 1996. But this will augment, not replace, shortwave.

Even when enough of the broadcasters have their satellite feeds in place, special receivers will be required to monitor them. While techno-citizens of rich countries may afford such luxuries, emerging nations, the primary targets of many broadcasters, cannot. Inexpensive shortwave radios win again.

With new transmitting and receiving techniques like narrowband technology and digital signal processing (DSP) being implemented in modern HF equipment, much of the fading and interference associated with shortwave signals will be a thing of the past.

The high frequency spectrum is a valuable resource. To expect its abandonment in favor of satellites anywhere in the foreseeable future is unrealistic. While satellite technology will make huge advances in coming years, and prices of receiving equipment will become more affordable, don't sell your shortwave receiver just yet.

Bob Grove, WA4PYQ
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