Volume 11, Number 7 • July 1992 $3.75

Monitoring Times

A Publication of
Grove Enterprises, Inc.

Voice of America
CELEBRATES 50 YEARS

L.A. Story
MONITORING THE MADNESS

Introducing the
Grove SW-100
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Plus America's First Radio Election, How To Take a Scanning Vacation, and more tips for summer listening

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July 1992

Monitoring Times

The VOA at 50

8

By Jeff Chanowitz

Fifty years ago a broadcast was made to Germany. It opened with the words, "Here speaks a voice from America." The name stuck, and the Voice of America began its distinguished career.

Although many feel the VOA's job is over with the ending of the Cold War, the agency's charter indicates its purpose is not primarily anti-communist, but to provide listeners with enough objective information to make their own judgments. The target areas may shift, but as long as there are populations who are denied access to information, especially about the U.S., the VOA will remain relevant.

Planning a Scanning Vacation

14

By Jack Sullivan

Take an inviting beach and a military radio buff, and you have a combination guaranteed to please the whole family, because that's where the largest number of military bases are located. This kind of vacation takes some advance planning, however, and seasoned traveler Sullivan will show you the ropes.

The 1924 Radio Election

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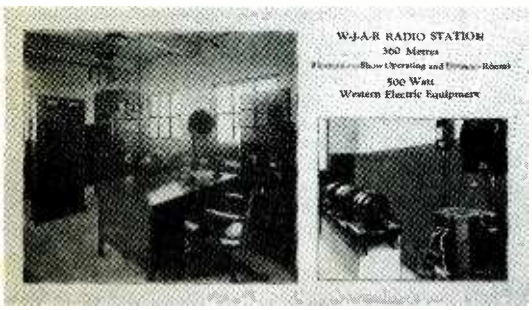
By Don Moore



Before 1920, radio had not been considered a serious vehicle for mass communication. Nonetheless, hopes were high for the part radio might play in the 1924 election. The response of the nation and the technological feats pulled off by the broadcasters far exceeded anyone's expectations and changed the nature of both radio and politics forever.

COVER:

A fireworks display at Epcott (photo by Harry Baughn) is the background for the new Grove SW-100 receiver (production model may differ slightly in appearance).

✔ Check Your Label!
If there is no date next to your name, or if it has expired, this is a sample issue of Monitoring Times

Monitoring the Madness 22

By Torno, Amaniera and Dokey

As the nation sat riveted to the television set while Los Angeles exploded in violent reaction to the jury's verdict in the Rodney King case, California hobbyists were tuning in their radios. Here are the accounts of three monitors who followed the dramatic events, each tailoring their listening strategy to their particular equipment and location.

Introducing the Grove SW100 26

By Bob Grove

It's been a long time coming, but a new receiver representing a monitor's approach to receiver design is almost here. *American* manufacturer Bob Grove traces the development of the SW-100 and the specifications the receiver is designed to meet.

And much more...

Most utility listeners know by now that, contrary to expectations, the end of the Cold War has not resulted in much, if any, decrease in the "spy" numbers transmissions. "Outer Limits" reports receiving reader loggings of number stations, and so does "Utility World," which examines some of the current thinking and theories regarding their source and intent.

Another area where theory abounds concerns antennas. But as "On the Ham Bands" points out, theory and reality don't always coincide. "Antenna Topics," by the way, has construction details for a nifty wire beam that provides high gain and portability for that summer DXpedition.

Chances are if you popped into a hamfest or flea market this summer, you picked up a real "bargain." Now you realize you are no technician and what could you have been thinking when you dickered on a radio that doesn't even work?! Well, don't despair. "DeMaw's Workbench" will help you examine critical but easily repaired or replaced elements of your prize that may restore it to working order without major surgery.

Most of all, enjoy your summer; for some "easy listening" check out "The Beginner's Corner" for some entertaining but not too strenuous targets. As long as you keep *Monitoring Times* close by your radio, we guarantee you'll never be bored!

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LETTERS

July Fireworks

It's July, and do we have a hot issue for you! As you can tell by our cover, publisher Bob is proud to announce his long-anticireceiver, designed for radio monitors by nitor. Fireworks also commemorate the 's celebration of fifty years of broadcast-

Fireworks of another kind exploded in s Angeles this past May after the Rodney ng trial. Instinctively, many hobbyists aded directly for their radios. Three of our aders volunteered their accounts of the exerience. Their monitoring strategies are an excellent model for anyone in the vicinity of a large-scale crisis.

Getting Registered

When did radio first begin to be taken seriously as a vehicle for influencing public opinion and for mass communication? As you'll see in "The 1924 Radio Election," a case could be argued it began with the presidential primaries.

We are indebted to the Committee to Preserve Radio Verifications for lending us the originals of the precious cards and reply letters used to illustrate the article. They are dated even further back, to 1923. I wonder where these QSLs would have been today if it weren't for this dedicated five-person task force?

A committee of the Association of North American Radio Clubs, the CPRV, preserves the collections of hobbyists who are no longer active or are deceased. QSL cards represent a slice of radio history worth preserving; a fact many hobbyists or their survivors often fail to appreciate.

Have you ever thought what may be the fate of your hard-won collection? You can register it with the committee now, while you are still an active collector. The committee provides stickers to apply to your QSL albums station stating that is it your wish that your collection be donated to the CPRV.

When received, the cards and name of the original owner are catalogued into a computerized index. The actual collections are currently archived at the Boston headquarters of the *Christian Science Monitor*.

For more information on the Registered Collections program contact John C. Herkimer, Registered Collections Coordinator, CPRV, P.O. Box 54, Caledonia, NY 14423; or for more information on the work of CPRV contact CPRV chairman Jerry Berg, 38 Eastern Avenue, Lexington, MA 02173.

In a different vein, we were happy to learn that a registration service available to shortwave listeners many years ago is still in effect; Hank Bennett (P.O. Box 3333, Cherry Hill, NJ 08034) is still running a program in which you, a dedicated shortwave listener, can receive "call letters" as a registered listening post. In response to those who have contacted *MT* wondering if the program is still active, Hank says "We are DEFINITELY in business."

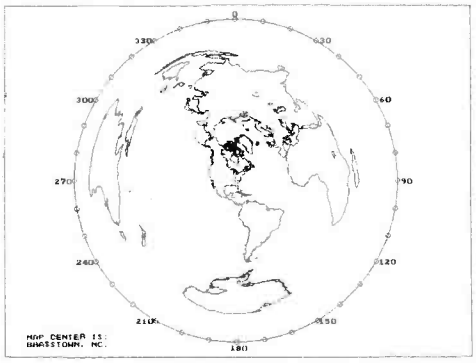
Hank adds that personal concerns over the past year have kept him away from home a great deal, but current inquiries should receive a prompt reply. Unfortunately, Hank did not provide any additional or current information on the registration program.

It's a Self-Centered World

In April, Todd Dokey of California asked about the availability of customized global maps centered on the listener's location. Harold Bower of Sunbury, PA, and Clem Small of Vermont both responded that the American Radio Relay League (225 Main St, Newington, CT 06111; 203-666-1541) has carried maps centered on different cities.

The best map, however, was sent in by Jacques d'Avignon of Canada. The map center is Brasstown, NC, "since everyone knows the world revolves around Brasstown!" It was a delightful surprise to discover this map was produced using DXAID—one of the propagation programs reviewed this month.

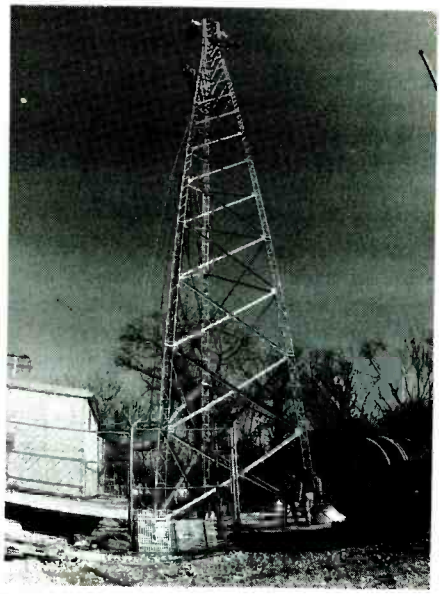
So there you are, Todd. Get a copy of DXAID and center your world anywhere you want. If anyone tries Todd's theory of mapping your logging sessions, let us know how the project worked and send us a sample!



Back to BART

"One of my co-workers was on the last BART train under the bay in the 1989 earthquake," says Paul Sullivan of Albany, CA. "When I spoke to her later, she said that the passengers didn't even know there had been a quake until the train got to the West Oakland station."

LETTERS



Vandalism is suspected in the collapse of this 100-ft cellular telephone tower in Itasca, NY. Jack Svetlik of Parkridge sent these shots of workers repairing the damage to transmitters after the tower was re-erected.

Here is some more "amplification" from Paul on the May article on the Bay Area Rapid Transit system:

"The supposition that the Embarcadero station was an 'afterthought' is correct; that station didn't open until three years after the San Francisco (M) line was put in service.

"The area covered by the K line is the ONLY area in the BART system with more than two revenue tracks. Whether this is why it has a different designation I don't know.

"The special trains from the Oakland Coliseum are usually referred to as 'event trains.' They are operated as callsign 95x to an area outside of the Fruitvale station known as the 'pocket track.' When the event is over, the train will be put into service.

"The origin of the term 'consist' (*all the cars in a train)* as a noun (accent on the first syllable) is this, as far as I can determine, from the regular railroads, where a 'consist' is the locomotive power on a train. The railroads probably corrupted the verb consist (accent on the second syllable)."

Responding to another May feature, the "Survey of 9.7-10.00 MHz," Gigi Lytle of Lubbock, Texas, identifies one of the stations that came in so weakly at Charles Sorrell's location.

She says, "9750 is Radio Portugal. I first heard them on December 30, 1991, at 0240 UTC with ID and giving the following frequencies: Eastern North America 9505, 11800, 11740; Western North America 9705, 21515. I kept waiting for them to announce 9750--the frequency I was on, but they did not! The broadcast was parallel to 9705."

Data Base

A year ago Charles Bolland (P.O. Box 18402, West Palm Beach, FL 33416-8402) offered a database program to shortwave enthusiasts. He reports good response from *MT* readers, so he is now offering you this update:

"I have recently updated the same database [processed in Q&A version 3.0 by Symantec Corporation] and included a field which specifies on which continent the station is located. Now information on a radio station can be pulled by its schedule, frequency, name, country, language or continent.

"For instance, if a user were interested in having a list of all the shortwave broadcast stations located in the Middle East that are transmitting at a particular time in a particular language, he could easily request this information from my database file. When printed in condensed font, the database totals 85 pages of information."

Charles is offering his database at cost. Indicate which size diskette you need, and enclose $5 for 5-1/4 inch diskettes or $6 for 3-1/2 inch diskettes to cover postage, packaging and diskettes. If you need the database exported in ASCII for use in a different database program, that is also available on request.

We know the kind of hard work and dedication required to produce such a massive work. Thanks, Charles, for making it available to a most appreciative audience.

Data Reading

The meter man may be on the way out. He not "far out," but he's at least as far away as th street.

John Kaestner, Thiensville, WS, receive notice that the Wisconsin Gas Company wa converting to an automatic meter reader. "This morning the gas meter man arrived and began to make the change. It is a simple task and took about ten minutes. I was informed that what formerly took this meter man 5-1/2 hours to do would now take only ten minutes by simply driving past the houses and recording the figures. As he installs each meter he programs them as to name, address, etc.

"A lead and wire seal is no longer used as a tamper preventer, since if the unit is removed or tilted it signals the reader of the problem. The reader then manually inspects it for damage or tampering.

"The person I spoke with didn't know anything about operating frequencies except he thought they were AM. There is a small battery, a bit larger than an AA, that activates the alerting mechanism and then transmits the codes. It is supposed to last about 12 years. I'm not sure what the effective range is but I doubt it is more than a couple of hundred feet."

Save Those Batteries

For those of us who find our memories aren't what they used to be, here's a tip from Semon Hachikian of Upper Darby, PA. He has a trick to keep himself from running down the batteries on his Sony ICF-2010 unintentionally.

"Instead of turning on the front panel ON/OFF switch, I just use the "sleep" push button. This way if I forget to turn off the radio, the radio will turn itself off no later than one hour. I use the green switch on the side to turn off the radio (this radio can be turned off many different ways)."

Semon hopes this tip might be useful for owners of other models, who might not have thought of this use for the "sleep" switch.

Semon also suggested it would be helpful if the month and year were in larger letters on the cover of *MT*. Now that's an idea WE hadn't thought of. We said, "Sure, why not?" Is it big enough now?

Skeptical About Mobile SW?

The prospects have always been dismal—or very expensive—for acheiving decent shortwave reception in an American car. Until the Philips 777 shortwave receiver came along, that is.

Continued on page 97

...S BACK!

1992 Monitoring Times Convention

Atlanta, Georgia

OCTOBER 2,3,4
Omni Hotel at CNN Center

Tentative Schedule

Friday, October 2

12:00 to 5:00 PM
EXHIBITS OPEN AND
REGISTRATION BEGINS

7:00 to 9:15 PM
EVENING SEMINARS

Saturday, October 3

8:00 to 9:00 AM
REGISTRATION

9:00 to 12:30 PM
EXHIBITS OPEN AND
MORNING SEMINARS

12:30 to 3:00 PM
EXHIBITS OPEN AND
LUNCH BREAK

3:00 PM
EXHIBITS CLOSE

3:00 to 5:15 PM
AFTERNOON SEMINARS

7:00 to 9:00 PM
BANQUET

Sunday, October 4

9:00 to 12:30 PM
MORNING SEMINARS

CONVENTION CLOSES AT 12:30 PM

Here are a few of the great companies that will be there!

AIE Corp.
All Ohio Scanner Club
Austin Antenna
Auto Security & Accessories
Bearcat Radio Club
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Christian Science Monitor
R.L. Drake
DX Computing
Grove Enterprises
Japan Radio Company
Official Scanner Guide
Optoelectronics
Passport to World Band Radio
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Be a part of the 1992 Monitoring Times Convention by signing up today! Return this registration along with your payment and you too can take a step into the future.

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Address: _____

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COMMUNICATIONS

The Rising Price of Broadcasting

And you think that making ends meet is tough where you live? Consider the staff of Ukrainian Radio. In one recent program, we overheard a staff member bemoan the shortages that the station faces.

"Today, one desk has to be shared by two reporters and one microphone has to be shared among 15 to 20 persons," said the reporter. "The real knock-out blow," he continued, "came from the Ministry of Finance. Here, for example, the cost of renting transmitter time has increased dramatically. In 1991 we paid 157 million rubles. In the first quarter of 1992 this sum increased to R2,914,000,000."

C-SPAN II?

A radio service now testing in the United Kingdom is carrying English language programming from some international broadcasters—and U.S. National Public Radio. The World Radio Network (WRN) is on the 7.56 MHz audio subcarrier of the Sky Sports TV transponder (11509 MHz vertical polarization) on the Astra-1B satellite at 19.2 degrees East.

Currently, the service is operational between 0400 and 2300 UTC. Some of the broadcasters "on the bird" include regulars such as Radio Canada International, BBC World Service, Radio Moscow World Service and Voice of America. WRN, says the BBC Monitoring Service, intends to charge broadcasters for airtime, but this may be offset by corporate underwriting.

Brain Magnets

Microscopic magnets have been found in the human brain that might help explain possible links between cancer and electromagnetic fields, according to a report by the Associated Press.

"They are little biological bar magnets" made of crystals of the iron mineral magnetite, said geobiologist Joseph L. Kirschvink of the California Institute of Technology. The crystals are strongly magnetic, unlike other iron compounds in the body. They come in two sizes, about one-millionth and 10-millionths of an inch.

The discovery may be significant since many physicists have been skeptical about EMF-cancer links. Said Kirschvink, "they thought there were no plausible mechanisms by which electromagnetic fields could affect biological tissue."

Radios for Cambodia

What if they were having a war in your country and you couldn't hear the play-by-play on the radio? That's exactly what was going on in Cambodia. So UN Transitional Authority (UNTAC) troops set up a radio station to "broadcast to the public about UNTAC work aimed at leading Cambodia out of fighting [and] towards an election..."

It all sounded very good until someone realized that the Cambodians didn't have many radios. Enter the Japanese who plan to provide 250,000 radio sets so that poor Cambodians can follow along. The Japanese government will appeal to its people to forward their "excess" radio sets to Cambodia.

ARRL vs. Gays

The American Radio Relay (ARRL) League has been accused of anti-homosexual discrimination. According to a press release, the Lambda Amateur Radio Club (LARC), an organization for gay and lesbian ham radio operators and supporters, filed suit under a recently enacted Connecticut gay rights law.

LARC charges that the ARRL has repeatedly rejected advertisements submitted by LARC for inclusion in the ARRL's publication, *QST*. Lambda states that their ad has been rejected on the grounds that it represents "a special interest group despite the fact that *QST* continues to publish the ads of ham radio operator clubs with memberships ranging from Jehovah's witnesses to followers of Ayn Rand."

FCC Fines Are Whoppers

The FCC has dramatically increased their fines. How tough are the fines? If you are in violation of the rules governing distress/safety frequencies (making a phoney mayday call, for example), you'll have to cough up $8,000 — for each day that the incident occurred.

Maybe you're a CBer who decided to tweak up his transmitter a few extra watts to get over the interference. The fine is $5,000 a day. What's even more surprising is that the FCC is apparently granted the authority to increase these fines. If, for example, the FCC determines that you have the ability to pay the fines and thus a "relative disincentive," it can increase the fine by 50 to 90 percent, just to give it a little more clout. If the Commission feels that the misconduct was "egregious (flagrant/deplorable)," it can also increase the fine by 50 to 90 percent.

Say that for some reason—temporary insanity is always popular—you decided to issue a series of false distress calls from your mythical boat, *The Fool*. You are caught. The fine is $8,000 a day. You conducted this little charade for five days. That would mean that your fine would ring in at $40,000.

Suppose also that when you made your distress calls, you dared the Commission to find you, all the time sending hundreds of Coast Guard personnel racing through storm-ravaged waters (flagrant/deplorable), the FCC would be able to assess you an additional $36,000, bringing your grand total for five days of "fun" to $76,000.

The FCC has also set $25,000 as the fine for any hoax by a broadcaster that could harm the public—anything that would involve police or rescue forces being called, for example.

Just a few of the "pranks" that have led to the ruling include these false reports by stations across the country: a nuclear attack, a station being held hostage, a nearby volcanic eruption, a dangerous build-up of gasses at a local landfill, and the shooting of a popular talk-show host.

Direct Order: Shoot Them

Police are still trying to find out who nearly created a catastrophe in New York's Lower Manhattan. During one of the many "aftershock" disturbances following the Rodney King verdict, residents had gathered to throw rocks and garbage at police. Suddenly, what sounded like a police dispatcher ordered police to open fire.

"Shoot them," said the man, "This is a direct order. Shoot them."

The police on the scene did not follow the order and within minutes, the director of communications for the police department had ordered dispatchers to stop the transmissions. Officials do not believe that it came from an officer because orders to shoot are never broadcast in those terms.

The Secret Side of the VOA

Former VOA editor Nodar Djindjihashvili feels betrayed by an American institution for which he once felt gratitude and respect. As a Soviet emigrant, Djin was recruited in 1984 to work for the Georgian service. "I was proud to be a part of a radio station that preached the sanctity of human rights and the importance of social justice," he wrote in 1988.

However, according to an article in *The New Republic*, Djin (as he now calls himself) learned of a secret broadcast which bore all the signs of a covert intelligence signal. Djin had always believed VOA involvement in such activities to be Soviet propaganda.

COMMUNICATIONS

re playing our song: is it song request or a secret message from the VOA?

hen he brought this apparent violation : VOA charter to the attention of his riors, the broadcast was ordered anyway. w months later, Djin, one of VOA's most iable members by its own admission, was d on dubious grounds.

Now, seven years later, Djin's case has cently been heard by the chief judge of the .S. District Court in Washington, D.C. Djin, ho now works in London for the BBC's ussian service, is suing for reinstatement vith back pay.

Joe O'Connell, a VOA spokesman, was quoted as saying, "As far as any suggestion of broadcasting covert messages, we don't do it, we wouldn't do it, we are respectful of the law." However, even Charles Wick, director of the US Information Agency at the time of this incident, acknowledged that the VOA was used for such messages during his tenure, according to the report.

Is the VOA independent and truthful, or does the Voice of America speak out of two sides of its mouth?

Secret Service Chases Computer Hackers

The U.S. Secret Service; Montgomery County, Ohio, Sheriffs; and Dayton and Kettering police were involved in an investigation of a group of computer hackers who have tapped into a national credit rating company's information network. According to Sheriff Gary Haines, the suspects illegally accessed personal financial records from Equifax Services, Inc., in Atlanta.

In two separate raids, officials found computers and records stored on disks. In both instances, the computer records contained thousands of names, addresses and other information believed to have come from Equifax. As many as 30 hackers were believed to have been involved in the break in.

Larry Larrimer, a Secret Service agent, confirmed that the investigation was taking place and said that his agency was involved because it investigates telecommunications crimes involving 800 and 900 telephone numbers as well as credit-card fraud. Theft of computer access codes is a federal crime.

The Moscow Connection

A hobbyist in Federal Way, a town just south of Seattle, was listening to Radio Moscow when it was suddenly interrupted by a cordless phone transmission.

The listener soon knew, says the report in the *Seattle Times*, that this transmission was from a drug dealer. For seven weeks the hobbyist followed and documented the neighbor's activities until he was overheard to say he was leaving town. At that point the eavesdropper, who asked to remain anonymous, turned over his information to the police.

Sgt. Marty Joy of the King County police unit pointed out the danger of such covert snooping. "We don't encourage that, but we don't discourage keeping an eye open for a neighbor who drags 10 tons of potting soil and grow lights into his house."

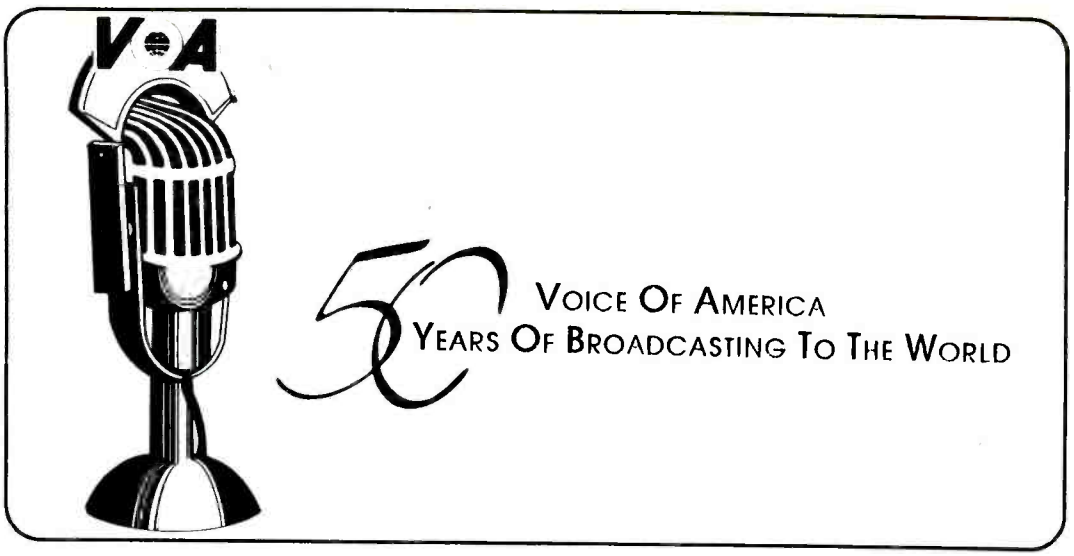
The monitor reported some insights as well, "We all have this perception that drug dealing is this high-glamour, big-dollar business. But from what I heard, 99 percent are struggling to pay the bills. They don't have any friends, don't speak to their families and are totally dependent on their netork. They were as paranoid as the Soviet politicians I listen to."

Grove to Speak

Speaking of paranoia, G. Gordon Liddy is the keynote speaker at the Fourth Annual Surveillance Expo Conference and Exposition. This security technology conference will take place August 4-7th in Tyson's Corner, Virginia. As in past years, one of the several seminars will be conducted by *MT* publisher Bob Grove.

For more information contact American Technology Associates, Inc, P.O. Box 20254, Washington, DC 20041; 703-318-0792.

"Communications" is compiled by Larry Miller from reader contributions. Credit and thanks this month go to: BBC Monitoring Service; Dave Alpert, New York, NY; Michael Baranich, Warren, OH; Harry Baughn, Brasstown, NC; Matthew Cawby, Seattle, WA; Jaimes E. Faucett, Dayton, OH; Paul Mitchell, Astoria, NY; Doug Robertson, Oxnard, CA; *W5YI Report*, and our anonymous contributors.



The VOA at 50

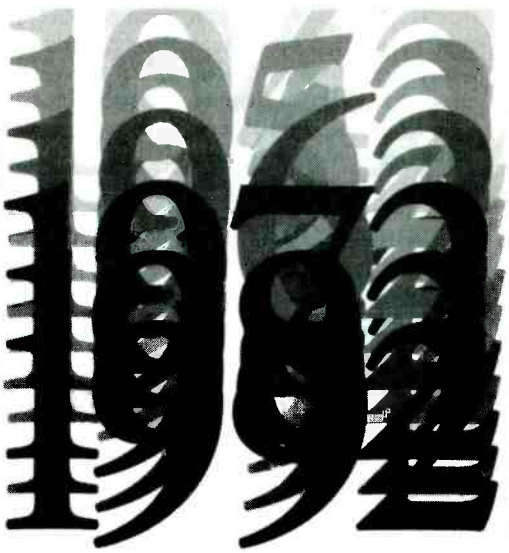
A Year of Celebration and Change

By Jeff Chanowitz

On February 24, with past and present directors of the VOA in attendance and red, white, and blue banners covering its headquarters, Dante Fascell, the chairman of the House Foreign Affairs Committee, addressed an audience of VOA employees and journalists. In his address, Fascell stated, "The last fifty years have been good. You (VOA employees) have done an excellent job and the country is proud of you...but we have got to look to the future with even greater optimism and with greater challenges." Yet, as the Voice of America's 50th anniversary marks a year of celebration, changing world events have also made 1992 a year of uncertainty.

From its headquarters located a few blocks from the U.S. Capitol building in Washington, DC, the VOA has broadcast the news and views of America to the world since 1942. As early as 1941, the United States' shortwave broadcasting resources consisted of just over a dozen low-powered, commercially owned and operated transmitters. Then, shortly after the attack on Pearl Harbor, Franklin Roosevelt established the Foreign Information Agency. On February 24th, the first broadcast was beamed to Europe via the BBC on medium and longwave transmitters.

The announcer, William Harlan Hale, opened the German language broadcast with the words, "Here speaks a voice from America." The name took hold and the FIA became known as the Voice of America.



Despite a troubled period during the McCarthy era of the early 1950s, the VOA has continued to expand its world coverage and news reputation with a primary focus on delivering its message through the Iron Curtain. In the 60s and 70s, the VOA expanded its programming to include the Third World.

Today, the VOA has emerged as a major international service with broadcasts in 44 different languages and a worldwide network of 26 news bureaus. In addition, with transmitters and relay stations located in Botswana, Costa Rica, Germany, Greece, Morocco, the Philippines, Sri Lanka, Thailand and the United States, VOA has established a global audience that is estimated to number in the hundreds of millions.

Despite airing US government editorials, the service continues to abide by its 1976 charter which mandates "accurate, objective and comprehensive" news coverage. Yet, the dissolution of the Soviet Union and the ending of the Cold War has resulted in the Voice of America's future role being questioned by some government officials in Washington, DC.

Chase Untermeyer, the current director of the VOA, refuted this perception stating, "The VOA was never intended to be an anti-communist tool and symbol of capitalism against the Soviet Union." He added, "The VOA started out to tell the truth, which was not being done out of Berlin and Tokyo at that time. It was not anti-communist, but presented enough material for listeners to make a judgment."

The Changing Face of the VOA

In response to the developments in the former Soviet Union, President Bush established a Task Force on US Government International Broadcasting. Its purpose was to evaluate the US government's current role in international broadcasting and make recommendations for the future direction of such organizations as the VOA. In December, the task force concluded its report recommending that the VOA become a more "global" service. In addition, the task force suggested that there should be a reexamination of the languages that the VOA broadcasts.

ıse Untermeyer, current ector of the VOA.

Untermeyer disagreed with some of the task e's findings stating, "If we are not global, it ecause we don't by law, broadcast to the US don't aim at Australia and New Zealand." t, he does admit that the VOA will place creased emphasis on programming for the Third /orld in the future. Also, because of the chang- ıg world situation, which makes predicting future programming needs almost impossible, Untermeyer also disagreed with the report's other recommendation commenting, "Unless ordered to, I will not reassess the languages we broadcast."

For Frank Shkreli, Deputy Chief of VOA's Eurasian division, the changes in the former Soviet Union have made a direct impact. Shkreli commented, "The structure of the programming has changed in the sense that shows are faster moving and our programs are livelier." He added, "Because all of our directors have been to the region to which they broadcast, we now have a better sense of what the audience wants."

Today, many local, independent stations have gone on the air in Russia and in the former Soviet Republics. This has caused increased competition for listeners. Not wanting to lose their audience, the VOA is responding by providing innovative programming such as "Radio Bridges," which are panel discussions on topics by two groups of people in two different countries linked via satellite or by phone lines, and informative "How-To" programs that present information on topics ranging from starting a business to opening a stock market.

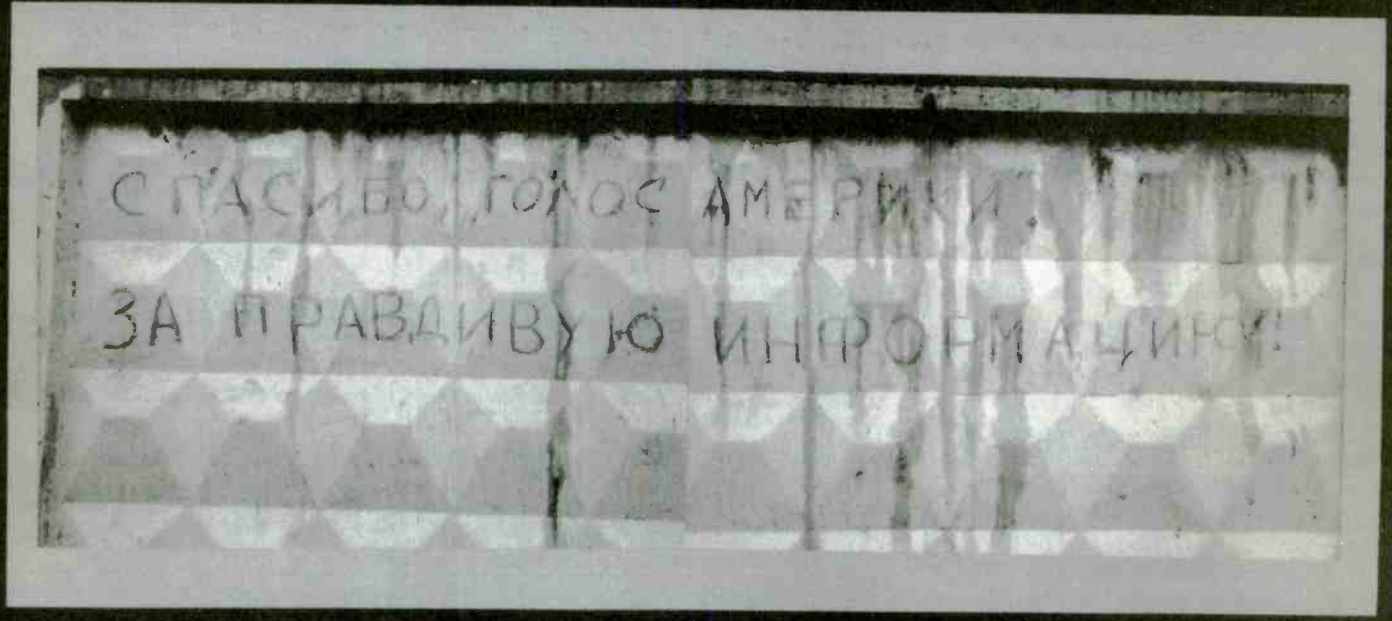
Shkreli stated, "For the past fifty years, people were told what to do by the center in the Soviet Union. Today, people need information about capitalism...In that area, we have an important role."

In addition to programming changes, the VOA has recently placed a correspondent in Russia and is also airing programming and news on 18 radio stations throughout the Eurasian region including the following shortwave broadcasters: Radio EKHO (Moscow, Russia), All Russian State Radio, Gostelradio (Tibilisi, Georgia), Radio Baltica (St. Petersburg, Russia) and Radio Vladivostok (Vladivostok, Russia).

Chanewitz

The exterior of the VOA building is decorated for the 50th anniversary celebration.

"Thank you Voice of America for the correct information."



Graffiti found on the wall of the Moscow White House facing the American Embassy after the August 1991 coup attempt in Moscow. The translation reads: *"Thank you Voice of America for the correct information."*

Yet, the true impact of fifty years of VOA programming is exemplified by those who listen. One long-time listener is Vaslev Havel, the famous playwright/dissident and current president of the Czech and Slovak republic. On his first visit to the United States, Havel requested to see the VOA's studios asking, "to say hello to those guys and ladies who I have been listening to for so many years." Polish President, Lech Walesa, was also a listener and described foreign broadcasts to Poland as the "sun in the midst of darkness."

Today, VOA's impact is felt in countries like Albania. While on a visit to the long-isolated Balkan nation, Frank Shkreli commented, "It was unbelievable! Everybody you talk to was a VOA listener." He added, "These people were very knowledgeable about world events thanks to the VOA."

Loyal listeners can thank the under-rated and hard working employees of the VOA for the hundreds of hours of fair, accurate and interesting news programs broadcast each week. With past professions ranging from taxi driver to university professor, VOA employees are as diverse as the programming and languages they broadcast.

To qualify for a foreign broadcaster position at the VOA, a person must possess native fluency in a foreign language, proficiency in English and a background that includes public speaking or broadcasting. Yet, despite difficulties which include adjusting to life in Washington, DC, and obtaining visas for family members, VOA broadcasters have established a track record of excellence. The professionalism of VOA's employees is exemplified by Zamira Islami, who works in the Albanian service. During the reign of the brutal communist dictatorship in Albania, she risked reprisals against family members in order to broadcast the truth.

Another Albanian broadcaster is Inia Therecka. He spent the last 25 years in a labor camp serving a sentence on trumped-up charges of crimes against the state. In 1989, Therecka escaped from Albania and managed to get to the United States. In 1992, Therecka was hired as an announcer. He is very happy at his new job because he also used to "listen to the VOA's wonderful voice of freedom in Albania."

Such brave and determined people are not uncommon at the VOA. Without doubt, it has been the dedication of correspondents, broadcasters and support staff who have made the VOA's 50th anniversary truly special.

Budget Constraints

With continued US budget deficits, the VOA has felt the sting of cutbacks. In the past, financial constraints have caused the VOA to close news bureaus in Mexico City, Boston and Houston. Also, budget shortfalls have temporarily caused the VOA to stop responding to the million pieces of mail it receives each year. Even VOA's extensive coverage of the Persian Gulf War required the passing of a special supplementary budget by the US Congress. Despite feeling the pinch of cuts, Untermeyer remains optimistic commenting, "In an era when many agencies of the US government are retrenching, we are actually expanding."

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Yet, the VOA budget is extremely vulnerable. The station receives no direct funding but must rely on the United States Information Agency to allocate funds for its budget. Untermeyer admitted that this puts the VOA in a precarious position financially, similar to "living on the edge of two knives." For the future, it's hoped that the budget process can be reformed and that VOA's funding will be allocated directly from Congress.

VOA at 50

As part of the 50th Anniversary celebration, the VOA is holding a listener's contest that will award over 10,000 prizes, including T-shirts, shortwave radios and eight trips for two to Washington, DC, and Disney World. SWLs and hams can also receive a special 50th anniversary QSL and certificate by listening to the VOA's amateur club stations, which include K3EKAVOA in Washington, DC, DX2VOA in the Philippines and V31VOA in Belize. If you can visit Washington, DC, the VOA will have a special exhibit of photographs and memorabilia highlighting the VOA's 50 years of broadcasting to the world.

If you can't travel to the Nation's capitol, many relay stations around the world will host a variety of events to celebrate the anniversary. In addition, the VOA has commissioned a television documentary, called "Some of Our Yesterdays," which recounts the story of the VOA in the words of famous people such as Mikhail Gorbachev, President Bush and John Houseman, who was the VOA's first director.

For details about the 50th Anniversary celebrations, listen to the VOA or write to: VOA 50th Anniversary Office, Room 1541, 320 Independence Ave. SW, Washington, DC 20547.

For those who wonder about VOA's commitment to shortwave broadcasting, Untermeyer removed all doubts, stating strongly, "While it's clear that in the early 21st century there will be other forms of broadcasting, there also will be a place for shortwave...if only because it's the only way to reach many countries that are denied access to information." Shkreli also added what shortwave listeners have known for a long time, "We will never get rid of shortwave. It has made us what we are today!"

As the world enjoys a period in which national borders have opened up and information is flowing more freely than at any time in history, many critics discount the need for services like the VOA. Untermeyer responds to these nay sayers, "There are still places that are denied access to free information, such as China and Iraq and many countries, such as the Soviet Union, may backslide from democracy."

In the event that new dictatorships emerge, we can be assured that the VOA will continue to provide truthful and uncensored information about the United States and the world as it has during the last fifty years.

MT

The VOA newsroom staff produces an average of 180 stories each day.

VOA's broadcasting studios.

VOA's Albanian service with Inia Thercka, center, and Zamira Islami, right.

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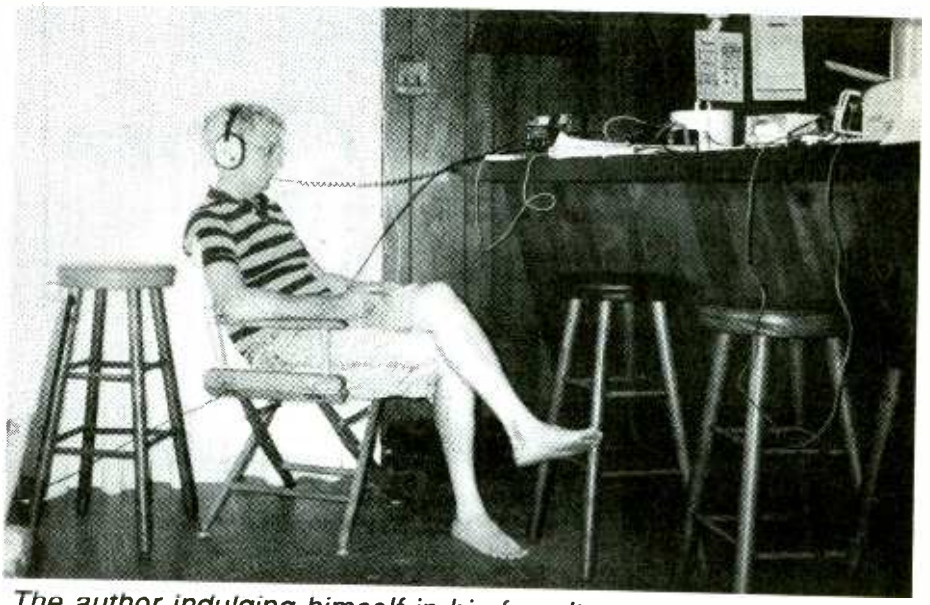
Planning A Scanning Vacation

By Jack Sullivan

The long, lazy days of summer are here at last. If you are like me and enjoy interesting monitoring, vacations are an ideal way to tune in on some really exciting action: military communications of the VHF/UHF ground, ship and aircraft variety. So let's go visit the top areas where great summer get-aways come complete with all the super radio action you can handle!



The author indulging himself in his favorite vacation activity.

Planning the Scanning Vacation

Vacations for many people are escapes to warm, sunny beaches. If you, too, enjoy the seashore, you're in luck, because that's where the greatest number of military bases are located, featuring intensive air, sea and ground activity. Here are a few of my favorites:

Virginia Beach, Virginia

Here you will find great Atlantic beaches, lots of hotels and houses to rent and easy access from most of the major population centers in the Northeast and Middle Atlantic states. Clustered here is also a number of busy military air and naval bases: Norfolk Naval Air Station, Oceana Naval Air Station, Fentress Navy Auxiliary Landing Field, FACSFAC VACAPES (Fleet Area Control and Surveillance Facility) callsign GIANT KILLER, Langley Air Force Base (home of the famous 1st Tactical Fighter Wing and their F-15 Eagles), NASA's Langley Test Center and nearby Patuxent River Naval Air Station, the naval Air Test Center and NASA Wallops Flight facility.

Norfolk Naval Station is a major naval base. Southeast Air Defense Region has a remote communications outlet here also (callsign GROVE). Action is dawn to dusk seven days a week, with less activity at night and on weekends. Look for plenty of fighter intercept activity, AWACS operations, aircraft carrier flight practice and much more.

Fort Walton Beach, Florida

This beautiful Gulf resort community is right in the center of the Free World's largest air base, Eglin Air Force Base, home of the Air Force Development Test Center and TAC's 33rd Tactical Fighter Wing. With tens of thousands of square miles of test ranges in northwestern Florida and out over the Gulf of Mexico, operations at Eglin go on non-stop from sunup to sundown, mainly during the week.

Air-to-air and other missile "shots" are frequent, as are many different types of weapons systems tests such as electronics countermeasures (ECM) and "smart" weapon drops. And to add variety, there is nearby Tyndall AFB, with intensive air defense exercises in the Air Combat Maneuvering Range (ACMR) over their Gulf ranges; Hurlburt Field, home of the new Air Force Special Operations Command, and Pensacola Naval Air Station, with heavy naval air training and the home base of the Blue Angels.

San Diego, California

San Diego combines an ideal locale and climate with some of the most exciting military radio activity to be found. North Island Naval Air Station in Coronado is home to key elements of our Pacific Fleet and busy Miramar Naval Air Station is home to the Navy's Fighter Weapons School, known as TOP GUN, as well as aircraft carrier F-14 equipped fighter wings. Here is also FACSFAC SAN DIEGO (callsign BEAVER) and Coast Guard Air Station San Diego, located at Lindbergh International Airport.

Offshore activity is nonstop, with much of the communications being centered around San Clemente Island Naval Auxiliary Landing Field offshore in Warning Area 291. You can expect air-to-air combat drills, AWACS operations and much more. San Diego is also one of the world's largest naval bases.

Other locations

Space does not allow an exhaustive listing of the most exciting vacation spots for monitoring military communications, but a few of them are Vandenberg Air Force Base and the Western Space and Missile Center in Lompoc, California; Point Mugu Naval Air Station and the Pacific Missile Test Center in Oxnard, California; Jacksonville, Florida (with Jacksonville Naval Air Station and Air National Guard interceptors at Jacksonville International Airport as well as Cecil Field Naval Air Station and nearby Mayport Naval Air Station and FACSFAC JACKSONVILLE).

Z

Military control towers to civilian aircraft
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"Guard," or military emergency. Frequently used for brief tactical messages.
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81.9 Coast Guard air activity Ground:
5/140.65/140.775 Naval Investigative Service undercover operations (FM)
140.15/140.25/ 140.3/141.2 Navy airbase ground operations (fire/crash) (FM)
75/138.175 Air Force Office of Special Investigations (FM)
5 Air Force Security Police duress alarm

s/MHz
.8 Fleet Warning Common (AM) (ship-to-ship and ship-to-shore calling)
.7/274.8 Observed comm nets in Norfolk, VA area (AM)
3.0 Military emergency channel
6.8 VHF Calling/emergency (FM)

uggested Further Reading:

Guide to Military Installations, 2nd edition (Stackpole Books - phone 800-READ-NOW) $17.95. A little spotty in places, but overall a good basic guide book. Includes addresses and phone numbers for base Public Affairs Offices.

North American Aircraft & Aerospace Museum Guide, 1990 edition (Bruce/Beeson Publishers) They miss a few, but still pretty good and a must if you are planning to visit the areas described in this article. Write to them at 2428 East 56th Place, Tulsa, OK 74105. I got my copy for $12.50 at the Kalamazoo Air Museum in Michigan, so you might check this one out in the gift shops at local air museums.

Also on my list are Cocoa Beach, Florida (Eastern Space and Missile Center, Cape Canaveral, Patrick Air Force Base and the Kennedy Space Center); Atlantic Beach, North Carolina (near the home of the 2nd Marine Air Wing at Cherry Point Marine Corps Air Station and the AV-8B Harrier jump jet); Corpus Christi Naval Air Station in Texas and Whidbey Island Naval Air Station in Oak Harbor, Washington (home of the EA-6B Prowler and "Prowler University.")

Last but not least, South Carolina offers two exceptional locations at Hilton Head Island (near Beaufort Marine Corps Air Station) and Myrtle Beach (near Myrtle Beach Air Force Base.) As you can see, one or more of these vacation spots is within easy driving distance of most of the country's population. (It's a lot easier to drive rather than fly when you bring your radio gear along.)

What To Do Next

Contact the Chamber of Commerce or Visitors' Bureau for the place you have selected to visit. A single phone call will get you literature on area hotels and house rental agencies. I prefer houses for several reasons: one, you can put up temporary antennas without a problem; two, you can secure your radio gear better in a house than in a hotel room; three, it's far cheaper to cook some meals in the kitchen of a rental house than to call room service or eat out in restaurants; and four, most beach houses sleep up to 10 to 20 in several bedrooms, so getting a group together to split costs becomes an attractive possibility.

Make sure in your process of selecting a place to stay that you have a workable plan thought out for where you will put your antenna and how you will get the coaxial cable back inside to your receiving equipment. Narrow your choices down to your top three or four, then book early and fire off whatever deposits and payments may be required. If possible, plan to stay at least a week.

If you have to settle for a hotel room or condominium rental unit, at least make sure that you get as high up as possible and that it has a balcony or deck facing in the direction of your primary interest. Also, remember that an outside antenna will make the difference between hearing or not hearing military transmissions in many cases.

Give a call to each of the Public Affairs Officers at the bases near your vacation site and request their standard handout package for newly arrived personnel. This material usually includes a very informative booklet describing the base, its operational units and the types of aircraft and ships and their missions.

Line up your radio gear and check that you have everything you will need before you leave, including the little things like adapters, batteries, replacement fuses, pens, pencils, log books, blank tapes, etc. Headphones are a good idea for listening when others are asleep or watching TV, etc. Spending part of a vacation day searching for something you forgot or suddenly find you need is not a lot of fun. Think things out beforehand and plan ahead carefully.

Antennas and Feedline

For field trips, I prefer my Grove Omni. Bob Grove introduced me to this antenna some years ago and I find it excellent for broad frequency coverage, light weight, and easy both to transport and to set up and take down in temporary field installations. Usually a length of nylon clothes line is all that is required to lash this antenna to a balcony railing, picnic table or other available mounting location. You might want to try the Grove ANT-6 Hidden Antenna which is basically a portable version of the now-discontinued Omni and perfect for this application.

I have also found that a 50 foot length of low-loss double shielded RG-6 cable is excellent for temporary field setups between the antenna and your receiver. If your antenna takes an F connector, make sure you have the necessary RF adapters to convert the F connector on the other end of the cable to the input of your receiving equipment.

Install the antenna at the highest point available to you without compromising safety. Getting electrocuted or falling off a hotel balcony are not fun ways to spend a vacation, but they are very quick ways to end one!

Receivers

I have traveled with a Radio Shack 2004, a Regency MX-5000, an ICOM R-7000 and a Fairmate HP-100E handheld. Any scanner or receiver will do as long as it covers the 225-400 MHz UHF military comm band. One technique that I have used in very busy areas is to have two receivers and two antennas. One is used for searching while the other is used to tape things that I find. I recommend Radio Shack's voice actuated cassette recorder for this application. Pack good quality blank 90-minute tapes.

A handheld scanner is a nice companion on a vacation trip. You never know exactly where you are going to wind up when exploring away from your monitoring base, so it's always a good idea to pack one of the few handhelds that includes the military aero band, such as the AOR AR-1000, Fairmate HP-100E or HP-200. Another good idea is to equip yourself with a set of fresh alkaline AA batteries for those times when you are going to be away from the battery charger for an extended period, such as a day at an air show. Handhelds eat up NiCad batteries at a fearsome rate, so be prepared! A handheld scanner with dead batteries is equal to having no scanner at all!

The basic field scanning technique that I use is to program the memory channels of my scanner with all the known channels for the area that I'm visiting. The search limits are then set at 225 and 400 MHz. I scan the memory channels frequently for activity. When none is heard for a period of time, I switch to search mode (primarily AM). Using two receivers allows you to accomplish both functions simultaneously.

During the evenings and on weekends, when tactical communications drop off, I switch to the 137-144 and 148-151 MHz bands. There is usually a lot of FM ground communications around military bases, including undercover investigations and some pretty sophisticated comm systems. Other bands in which to look for signals in military operating areas are the 406-420 and 162-174 MHz ranges.

Another useful monitoring technique is to monitor the departure control frequencies. Tactical missions are handed over from here to range control or FACSFAC channels that you can then switch to. This way, you can follow an entire mission (usually around an hour in duration) and not miss anything.

Taping interesting intercepts is a fun way of preserving the great stuff that you will be listening to. In many cases you will run into strange or unexpected communications, such as in-flight emergencies or data links that you may want to listen to and study at your leisure later on. (I usually generate five to six 90-minute tapes on a 7 day vacation trip, along with 15-20 pages of notes.)

Frequency Directories and Maps

Having good frequency directories available during your vacation trip is essential. To begin with, you will need to know the frequencies used locally for air traffic control and for tactical military purposes in order to program them into your receiver memories. You will also need good directories in order to look up new frequencies as you come across them so that you can determine who is using those channels and for what purpose (air refueling, range control, etc.). I use and can recommend the following:

IFR Supplement (Department of Defense/ Defense Mapping Agency)

I use this handy little encyclopedia of aeronautical information a lot to check for the periodic changes that have to be made in my computerized frequency database. It is also a very handy reference to have next to your scanner at any time, especially when traveling. The current price is around $3.50, which is a real bargain. Call them at 800-826-0342 to request their Public Sale Catalog.

Top Secret Registry of U.S. Government Radio Frequencies (CRB Research)

A good basic guide to the full range of air and ground communications frequencies that you can expect to hear from any base. Available from Grove Enterprises.

Directory of North American Military Aviation Communications (VHF/UHF) (Hunterdon Aero Publishers)

Military aircraft frequencies cross-indexed by both frequency and by location. The four regional editions are available from Grove Enterprises.

Military Radio Systems-California (Mobile Radio Resources)

A good set of listings for California and some Arizona and Nevada military bases. I would recommend it if you plan to vacation in California. (Contact Bob Kelty at Mobile Radio Resources, 2661 Carol Drive, San Jose, CA 95125, 408-269-5814. The price is $40 postpaid.)

Maps that I have found useful include the local aeronautical sectional chart and area road maps. Sectional charts are available at most airport Fixed Base Operators (FBOS) or through map stores. They provide an excellent reference to airport radio frequencies and the names of important military training areas. Local street maps are usually readily available and show access roads to museums, bases, vantage points, etc.

Cameras

If you own a camera, make sure you bri it along. A great deal of additional fun is catchi memorable moments or locations on film f later viewing. A flash is handy, especially visiting a museum or taking a picture inside th cockpit of an aircraft parked at an airshow. (Th frequency preset cards found in almost ever military aircraft are a gold mine of information on radio channel usage).

Are We Having Fun Yet?

So you've picked your spot, gotten your place, loaded your car and off you go. If you're going alone, have fun! If you're going with your wife, another couple or other friends, plan to be flexible. Remember, not everyone will understand why you want to stay inside and listen to your radio while everyone else goes to the beach or elsewhere.

Plan to divide your time between your personal interests and group activities on an equitable basis. This may mean a compromise, such as scanning one day and another day shopping or sightseeing. Late afternoon, evening and the weekend usually can be counted on for breaks in the action, so you can plan your schedule accordingly. Set out with a clear understanding as to what everyone expects and you will surely have a good time.

Sidetrips are a good way to combine group activities with your technical interests. Most bases have guided tours, especially during the summer. Many bases have associated museums where historic aircraft and other gadgets can be viewed. And driving around the perimeters of many bases can provide some great vantage points for parking, monitoring and photographing the activity. Check with the Public Affairs people for tour schedules and other information. Don't hesitate to ask about schedules of upcoming events, such as airshows, major training exercises, and so forth. It never hurts to ask, and you may be surprised with what you find out.

Have A Great Time!

I have done a number of these types of vacations and find them to be excellent opportunities to relax and to enjoy yourself, while at the same time immersing yourself in quantities of exciting and unusual communications. Trips are also a great way to learn about military operations, equipment and communications systems. With the little extra effort that it takes to plan and execute a good scanning vacation you can expect to receive a much greater reward for your time and money. Have fun this summer!

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The 1924 Radio Election

By Don Moore

In the 1800s presidential elections were simple. Sometime during the summer, party hacks quietly gathered together and nominated a candidate. The campaign began in earnest on Labor Day. Local committees put up posters and passed out flyers. The party faithful paraded around town singing hastily composed ballads praising their standard-bearer or demeaning the opposing leader. The only way most people could see or hear the candidates was by special trains which would travel the countryside stopping in every little hamlet long enough for a short speech.

In short, elections were colorful, personal and fun. Then along came this guy named Marconi, and politics hasn't been the same since.

First Broadcasts

Except for a couple of private relays of election returns in 1906 and 1916, politics and radio didn't mix.

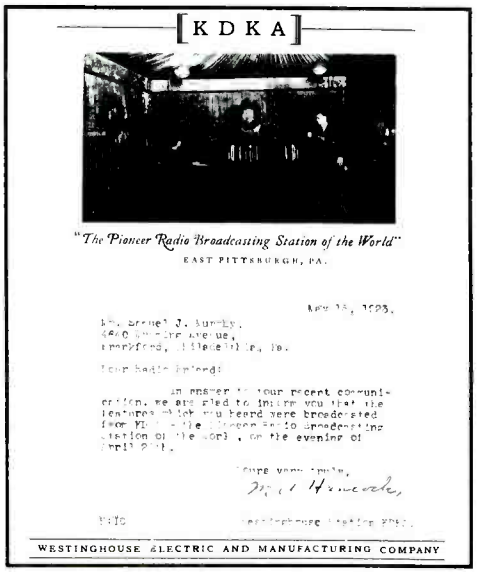
Then, in 1920, the nation's first radio station, KDKA, was started up with only two month's preparation just in time to broadcast the election returns.

The station was ready just hours before the broadcast. KDKA came on the air at 8:00 pm on election night. Election returns were phoned in to the studio from the *Pittsburgh Post* as they came off the wire services. Estimates are that only about 2,000 heard the broadcast, but they included some very influential people.

KDKA wasn't the only station broadcasting election returns that night. Earlier that day, the *Detroit News* had published a notice that the newspaper's amateur station, 8MK, (later WWJ) would broadcast returns. As in Pittsburgh, listeners were few. The paper also announced the results to the public via a megaphone from their front steps. The megaphone probably reached more listeners than the station; but that was soon to change.

Radio Develops

KDKA launched a revolution in communications and soon dozens of broadcasting stations were licensed around the country. Thousands and then millions of Americans purchased receiving sets. Stations began to broadcast speeches by local politicians at election time as part of their civic responsibility. Even President Harding began making occasional radio speeches. A November 5, 1921, speech by Harding inaugurated a new



Company engineer Frank Conrad, 8XK, was given less than two months to put together station KDKA in time to announce the 1920 election results.

1923 illustrations are courtesy of the Committee to Preserve Radio Verifications, Jerry Berg, Chairman, 38 Eastern Avenue, Lexington, MA 02173.

high-power RCA transmitter and was heard on every continent. After Harding's sudden death in 1923, President Calvin Coolidge continued to speak on the radio.

Not all politicians were receptive, however. When a microphone was placed in front of former Secretary of State Elihu Root, he exclaimed, "Take that away. I can talk to a Democrat, but I cannot speak into a dead thing" (Clark).

As the 1924 presidential elections approached, everyone began to think of radio. Politicians talked so much about using it that stations were afraid they would be deluged with requests for speech time. Political committees were set up to manage requests for air time and to see that the best speakers were given preference. In March, Owen Young, chairman of the Board of Directors for General Electric and RCA proclaimed "No citizen of this great country need say that he has not heard the pronouncements of the presidential candidates of the two great parties" (Barnard).

New Republic magazine predicted that the upcoming campaign would be mainly fought by radio. *Nation* agreed, editorializing that 1924 would be looked back on as "the radio year," but thought that by 1928 the broadcasting fad would be over.

Convention Time

The three-day Republican convention in Cleveland started the campaign off on June 10. To broadcast the convention, AT&T used special wires to put together a loose network of sixteen stations in twelve cities, headed by its WEAF in New York and WCAP in Washington. Never before had such a linkup been attempted, and it was a major test of both engineering and programming skill.

With colorful ace announcer Graham McNamee presiding, AT&T offered an attractive but expensive package to radio stations around the country. The biggest expense was rental of AT&T lines, which the receiving stations had to pay for. Although AT&T offered line rental at cost as a public service, it was still too expensive for many stations, especially more distant ones. However, Westinghouse's KFKX in Hastings, Nebraska, picked up the broadcasts and relayed them via shortwave to the West Coast for rebroadcast by KGO in Oakland.

No one was quite sure exactly how much programming the stations would receive from the conventions. Station schedules had to be flexible, so most booked soloists and readings so they could easily switch back and forth to Cleveland. Hopes, however, were high for the broadcast, as in this AT&T publicity statement...

> "This will be the first occasion that a program will be supplied continuously to twelve cities, enabling stations at these points to broadcast such features of the Convention as they desire to make available to their respective radio audiences... An announcer will be in constant attendance with concise and vivid descriptions of the events taking place in the Convention Hall and explanations of the significance of what is going on. The announcer will introduce the various speakers so that the entire matter will be an interesting broadcasting program" (Archer).

The convention took place in a 16,000 seat auditorium with a stage in the center, a pipe organ to the right, and a band to the left. WEAF erected a glass booth on the stage with a table, chair, paper, telephone, headphones and signal light board. Two microphones were placed in the booth (one a spare), and one each by the organ, band and speaker. Politicians, however, were not used to speaking into a stationary radio mike; they normally paced back and forth across the stage. To keep the speakers from wandering, a railing was erected around the microphone. McNamee controlled his own mike; the others were switched in from a control room behind the platform. An assistant was always stationed near the speaker's spot to pass along to McNamee

that he couldn't see. Others through- also telephoned in reports.

& WEAF weren't alone in broadcast- vention. Rival New York City station heir star announcer, Major J. Andrew le was also carried on WGY of ady. At the time, AT&T felt it had domain over broadcasting based on atents it owned, and AT&T had let it be hat no one else should assist in network sting not involving AT&T lines. AT&T, se, wasn't about to rent lines to WJZ in tition with their WEAF network. WJZ and arranged a special line through Western , without telling Western Union its true

here was no contest at the convention—it Coolidge all the way, which made coverage and allowed the broadcast- to focus on perfecting their k.

Still, the convention broad- sts became a national drama some stations not carrying e convention shut down to void interfering with nearby tations broadcasting it. Around he country, schools closed so that students could listen, radio demonstration rooms in department stores were packed with people, and sales of radio sets hit record levels. For the first time, the American people were able to look in on a national political convention.

The Democrats Meet

A few days later, on June 24, the 1446 delegates of the Democratic convention met in Madison Square Garden in New York City. Not only was this larger than the Republican convention, it promised to be a real battle as there was no clear front runner. In fact, the convention was to be the longest in the nation's history. Again, AT&T's WEAF and Graham McNamee were there, this time with 17 other stations in their network, as were WJZ/WGY and Major White, for a total of twenty stations. The broadcasters set up their microphones and glass booths on the stage as they had for the Republican convention.

The main part of the convention, starting with Senator Pat Harrison's keynote speech, was postponed to 7:30 pm because of better nighttime radio reception. More speeches followed, but the convention's most memorable radio speech was given by a young New Yorker, Franklin D. Roosevelt, who nominated New York Governor Al Smith. Roosevelt was praised for having a great radio voice. The worst performance was given by 64-year-old William Jennings Bryan. A renowned orator of the old tradition, Bryan was used to wandering around the stage. He wouldn't stay inside the railings by the microphone and lost his radio audience for most of his speech.

Finally, after some lengthy platform fights, the first ballot was taken. As expected, California's William McAdoo came in first, followed by New York's Al Smith. Various others were far behind, including little known John Davis with 31 votes. No one was close to winning and there was little chance for a compromise.

Days passed and ballot after ballot was taken. With each ballot the state of Alabama was called on to vote first. This drew national attention back to the political drama in New York as Alabama's spokesman, ex-governor Jim Brandon, drawled out, "Alabama casts 24 votes for Underwood" (an Alabaman senator) each time. By the fifteenth ballot the spectators in the galleries picked up the cry. Soon, the delegates joined and each ballot began with the convention hall chanting in unison, "Alabama casts 24 votes for Underwood."

Alabama casts 24 votes for Underwood!

Across the country, millions of people gathered around radios joined in, too. As it was repeated over and over, "Alabama casts 24 votes for Underwood" became a national joke and a symbol of a political party too divided to choose a candidate.

The balloting did come to an end with an unusual ticket of Wall Street lawyer John Davis and Nebraska Populist Charles Bryan...on the 103rd ballot after fifteen days. By this time, the Democratic party had made itself look like a vaudeville sideshow.

Still, the nation had listened attentively. At Sing-Sing prison in upstate New York, loudspeakers were set up allowing the prisoners to listen in as a special treat on July 4. In New York City, one cab driver got extra business by putting a radio and two headsets in his car.

When the conventions finished, station managers saw their public service obligation over, too. If they were going to continue carrying political speeches, someone had to pay for the time—logically the political parties.

The parties agreed, setting up 1924 as a true "radio election." This was easy when a speech was carried over one local station; however, because no set networks existed at the time, complex negotiations had to be completed before broadcasts could link multiple stations. Landline rental to link stations also added to the cost. An hour on one station might cost $500, but an hour over six or seven stations could easily cost $5000 or more.

A Slow Start

During the Democratic Convention, the campaign gained a Third Party candidate, as Progressive Robert LaFollette announced his independent candidacy. Then the campaign quieted down.

The real campaign wasn't kicked off until Labor Day, when all the candidates spoke on the radio. The most notable Labor Day speech was LaFollette's, which was the first political speech given in a radio studio without a live audience. John Davis started his campaign with a traditional railroad journey from September 6-17 through western and midwestern cities. Radio, however, was planned for; his car was wired with microphones, loudspeakers, and jacks to make it easy for local stations to plug in and carry his speeches.

As an independent, LaFollette didn't have the funding of the two major party candidates and worried about the cost of buying radio time. He soon changed his mind as his speeches carried by radio brought in enough extra contributions to more than cover the cost. In October, LaFollette launched a railroad campaign tour of the Midwest, and, like Davis, he spoke at radio stations along the way.

Coolidge, on the other hand, stayed at home in Washington, just giving occasional speeches via radio. Even so, Coolidge was on the air more than either Davis or LaFollette. Radio seemed to be a perfect medium for Coolidge, who was generally acknowledged as a good radio speaker, even by Democrats. His shrill Vermont twang, often an irritation when listening to him in person, disappeared over the air. Davis' clear sonorous voice seemed muffled on the radio.

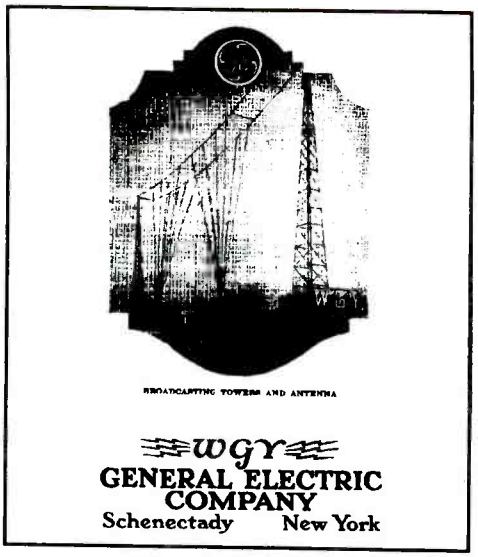
Shortwave Used

Through mid-1924, shortwave was still seen as an inconsistent novelty even by engineers, and few believed it could ever be used reliably for daytime long-distance broadcasting. Despite that, Westinghouse continued to experiment with SW and by October was ready to demonstrate its progress. On October 11, the H.J. Heinz Company of Pittsburgh celebrated its 55th anniversary. Ten thousand employees sat down in 65 banquet halls across the US and Great Britain. President Coolidge was the featured speaker—from Washington, D.C.

The President's speech was carried by landline to KDKA, then broadcast over shortwave. Other Westinghouse stations in Chicago, Hastings, and Springfield, MA, relayed it off the air over their transmitters. This was the first time such a broadcast had been attempted, and millions in the Americas and Europe are believed to have heard it.

As the campaign began drawing to a close, the Republicans took the radio game very seriously. For the final two weeks before the election, they bought all the time on two stations, WAHG, Richmond Hill, Long Island, and WHBF, Providence, RI. With programming originating from Republican offices in Manhattan, Republican politicians spoke morning, noon and night from October 21 to election day.

For a grand finale, the Republicans set up three big radio rallies. The first brought together



WGZ of New York City and WGY of Schenectady fought AT&T's attempted monopoly on convention coverage.

several major speakers on WJZ and six other stations. The following night they put together a "Midnight Theatrical Revue" of political speeches and entertainment with stars including Al Jolson and Elsie Ferguson. Running from 11:30 p.m. to 2:00 a.m., this was also carried on WJZ and several other stations. Finally, on the Saturday night before the election, WEAF and sixteen other broadcasters carried a huge rally of speeches and music from New York's Metropolitan Opera House.

The Davis campaign wound down on November 1 with big speeches from Carnegie Hall by Davis and New York Governor Al Smith carried by WJZ; WCAE, Pittsburgh; WMC, Memphis; WRC, Washington; WTAS, Elgin, IL; and WHAS, Louisville. Davis's final speech at 9:15 p.m. on election eve originated from WEAF and was carried by WCAP, WGY, KDKA, KFKX, KSD, WMC, and WGN, and on shortwave from Hastings to the west coast.

Coolidge's final speech was on a record 26 stations, coast-to-coast. It was estimated that his audience was the largest in history to listen to one man speak. To ensure there would be no interruptions on the west coast due to line damage, AT&T stationed several hundred servicemen along their lines through the Rockies. Coolidge's speech was non-partisan; he simply urged citizens to vote, then finished, "To my father, who is listening in my old home in Vermont, and to my other invisible audience, I say 'good night'." Many listeners remembered the personal warmth of his ending.

Americans went to the polls the next day, and the following evening almost every station in the country carried election returns in some form, with an estimated twenty million people tuning in. Music and variety programs usually filled in the gaps between reports. WLW in Cincinnati interspersed the returns with a comedy program. WEAF headed a 26 station hookup with the "National Radio Exposition Frolic," mixing election returns in a variety program hosted by Eddie Cantor with Will Rogers.

WJZ and WGY once again hooked up, this ti with WRC, foiling AT&T by surreptitiously usi the landlines of the Postal Telegraph Company. T results were also heard throughout the nation a overseas via KDKA's shortwave transmitter.

It was quickly obvious that Coolidge, a expected, had won in a landslide. Most station signed off by 1:00 a.m., although a few, such a KDKA, stayed on as late as 4:00 a.m. The Unite States' first "radio election" was over.

The Significance of 1924

When the 1924 campaign began, no one knew what radio would be worth as a weapon in the campaign war chest. For millions to hear the voices of the candidates was unique—it couldn't be duplicated in silent movies or newspapers. Many in both parties questioned how they could know if there was an audience listening and if their message was reaching them. By the end of the campaign, these questions and more were answered. It was clear that radio had improved politics and furthermore, politics had improved radio.

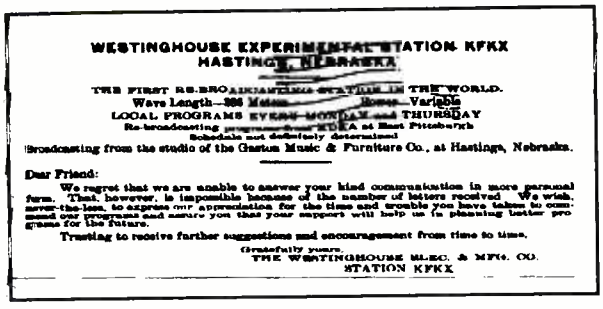
The election of 1924 was never really a contest. The country was prosperous and there was little doubt that Coolidge would win. Even though millions of Americans tuned in speeches and other election broadcasting, it is unlikely that radio changed many votes. The medium was still too unrefined for that. Coolidge's warm greeting to his father during his final speech probably won more votes than any political pronouncements by any of the candidates.

Gleason Archer wrote that "The effect of the election on radio was more important than the effect of radio on the election results!" Radio was, however, credited with focusing people on the election and bringing out a huge number of voters.

In a sense, radio "grew up" with the 1924 presidential election. At the beginning of 1924, AT&T thought it was technically impossible to interconnect stations coast-to-coast with long distance telephone lines. By the end of the year, it was a common occurrence. This, combined with increased revenue from the political broadcasts, encouraged AT&T to continue development of its networking between WEAF and other stations in the Northeast and Midwest, the forerunner of the NBC network.

Westinghouse used the election to explore the uses of shortwave, both in the Heinz broadcast and in using its shortwave station KFKX in Hastings, Nebraska, to relay programs to the Pacific Coast. Obviously, these advancements would have come in time, but the 1924 campaign gave broadcasting the impetus to try them out sooner.

In the short run, money was most important. For their presidential campaigns, the Democratic party spent $40,000 on radio and the Republicans $50,000. This doesn't include LaFollette's independent candidacy nor many state and local races across the country. The amounts may seem tiny



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STATION KFKX

Westinghouse' station KFKX in Hastings, Nebraska, proved the value of shortwave broadcasting by its successful relays from KDKA in Pittsburgh to WGO in San Francisco,

today, but the money kept stations afloat in a fledgling industry.

Even if radio didn't change votes, it did change politics and campaigning, especially speechmaking. It quickly became evident that the old style of the ranting word-artist wouldn't work on radio and that a new breed of political orator was being born. As *Saturday Evening Post* noted, the old style of "a good personality, a musical voice, a power of dramatic gesture have served to cover up baldness of thought and limping phraseology" (Archer).

While politicians might get by with "baldness of thought" with live audiences due to the excitement of the event, their charm didn't work on the radio where the listener was focused only on the speaker's message. Candidates had to speak clearly, intelligently, and sensibly.

Furthermore, excited "fire and brimstone" type speeches were often unintelligible on the radio; a warmer personal style came across much better. Several observers noted that young Franklin Roosevelt, who although not a candidate had made several speeches for the Democrats, had a perfect radio personality. When he spoke, listeners felt as if Roosevelt had dropped in at their parlor for an informal chat.

Instead of speaking mainly to the party faithful, candidates now had to tailor their speeches more for the undecided, and even the opposition. The audience for political speeches had changed. Because radio audiences did not feel as if they had to show signs of support for the speaker, the audience became not only bigger, but more heterogeneous. Undecided and opposing voters, who might not be comfortable attending a rally, could easily tune in at home. Sometimes it was even enjoyable to listen to the opposing side, at least in the eyes of *The New Republic*. "At the radio one can make faces at the speaker, call him bad names, or...indulge in vehement refutation to one's heart's content, all without discommoding the rest of the audience in the least or feeling the slightest embarrassment" (*Electioneering...*).

Politicians now knew that voters simply had to turn on the radio to listen to a speech. While a voter might be too shy to walk out in the middle of a long, boring speech, there was nothing to prevent him from reaching over and turning off the radio. Long speeches wouldn't do, except for special occasions. Strong, brief speeches with the main point up front became the rule.

Finally, with so many listeners focusing so intently on a speaker's message, truthfulness became very important. Fredrick Hicks, a regional director for the Republican National Committee, acknowledged that when candidates thought about how they were addressing hundreds of thousands of listeners, they became "conscious of the importance of delivering messages free from boastful predictions and demogogic utterances...radio would skewer the insincere" (Clark). LaFollette agreed that candidates were no longer willing to twist facts which they knew would be quickly received by millions via radio.

Not everyone agreed that radio was a positive force in elections. Some felt that radio did not adequately portray the excitement of a campaign, although for many it was as close as they would ever get. *The El Paso Times* wrote that people were really more interested in the shape of a candidate's ears and how his nose wrinkled when he laughed at his own jokes, which wasn't conveyed by radio. Others agreed that the lack of facial expressions was a drawback for radio broadcasting.

The *New York Times* thought that future candidates might be chosen as to whether they were "radiogenic...or even photogenic." Losing candidate John Davis agreed, "Ultimately a candidate may be chosen for two things — first, that he films well, and second, that he has a good radio voice." Perhaps *The New Republic* was the most farsighted when it wrote, "Ultimately a form of hokum will be devised that can be counted on to captivate the radio listener" (*Electioneering...*).

Radio may not have been so much a participant as a spectator in the 1924 election, but it did become an important political weapon and set the stage for an even greater role in the elections to come.

MT

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A Radio Diary

By Randy Torno, N6FBL

Wednesday, April 29 — 2:00 PM

As I was driving from my office in Beverly Hills, the broadcast station in the car had a newsflash that the verdicts in the Rodney King case would be announced in one hour. It kind of caught me by surprise—as it did most Angelenos. I don't want to sound ignorant of it—who hadn't seen the grainy video of King being savagely beaten? But the pressures of my job at a major TV production company had pushed this affair to the back burner.

The music continued for a few minutes as I fought my way through cross town traffic and then it was news time. The lead story was about Chief Gates of the LAPD, who had set aside a special fund of $1,000,000 in case of "problems" stemming from the verdicts. "Problems?" I thought. What kind of "problems" could he be thinking of?

6:45 PM

After an uneventful drive home, I was sitting down at the ham radio when my wife called in from the kitchen. "Hey, take a look at this," she said. There on the small black and white TV was a helicopter shot of a gang of black men beating the crap out of a white driver. This was in a very rough, gang and drug infested area of L.A., and I thought that it was probably some kind of gang violence.

After about ten minutes of watching this shot, I began to wonder where the LAPD was.

7:10 PM

The local stations had their traffic copters heading towards the scene when the first fires broke out. A few blocks away from the intersection a liquor store was starting to burn. This thing was escalating very quickly, I thought, and I headed into the ham shack to fire up the scanner.

7:20 PM

Safely ensconced in my suburban house about 25 miles from the trouble area, I still felt uneasy about the apparent lack of police control. Frantically searching through Gene Hughes' *Police Call Radio Guide*, I began to enter frequencies into the Bearcat 210 scanner.

Fire dispatch frequencies seemed about normal. I started in on law enforcement agencies. I struck paydirt with the SWAT team repeater frequency of 506.8375 MHz where I was later to hear the most exciting scanner listening of my life. This turned out to be one of several tactical repeater frequencies.

I tuned the Sony 2010 to the LAPD helicopter frequencies of 122.75 and 123.05 MHz. I didn't hear anything there, so I set it to scan those frequencies and went back to the Bearcat.

8:00 PM

In what seemed like just a few minutes, rioting and looting and burning had broken out all over the downtown area. The scanner began to buzz with calls for fire crews requesting assistance. The California Highway Patrol dispatchers on 42.46 MHz began to issue general warnings to all CHP to be very careful if passing this area on the freeway. There had already been reports of things being thrown at patrol cars, shots fired, etc. The LAPD dispatchers were trying to remain calm, but the edge in their voices was something I had never heard before.

The continuous helicopter coverage—your choice of seven camera angles just by flipping the TV dial—showed a city at war. The aerial shots of fires burning, as the sun began to set, looked almost too perfect, and unbelievable, like an expensive special effects movie.

8:40 PM

By now, violence was breaking out in several areas at once and it was clear that the situation was out of control. A major confrontation at LAPD headquarters was threatening to turn ugly. LAPD dispatch on 506.7375 MHz ordered all cars back to HQ to help defend the building. The mobs had taken control of the streets, that much was obvious, and the lack of police response to the downtown violence gave the events a dangerous angle.

Fires began to burn unattended as there were just not enough firefighters to go around. The fire dispatch frequency of 154.43 MHz was now constantly alive. The dispatchers were issuing serious life or death warnings to all fire trucks not to go into the stricken area without police escort. This touched off a great deal of radio communications between LA Fire and LAPD.

Unfortunately, I could not pick up any handheld radios, but it seemed that a lot of the police repeaters were being used as tactical channels. 506.7375, 506.5875 and 507.0875 MHz were especially active.

9:00 PM

"Shots fired!... We've been hit!" was coming from a fire truck on its way to one of the 40 or 50 fires burning. The dispatcher called them off the response and ordered them out of the danger area. I later learned that the driver of this truck was in critical condition with a bullet in the face.

Suddenly, the helicopter frequencies became active as the TV was announcing a major demonstration outside the Pacoima police station, where the four officers who beat King were stationed. This is about ten miles from my house, and I began to feel scared. I quickly punched up the Pacoima dispatch frequency as squad cars were being called in from the field to protect the station house from the mob.

The profusion of LAPD, news and Sheriff's office helicopters in the area kept the chopper control frequencies of 122.75 and 123.025 MHz buzzing. Interestingly, the news helicopters had the right of way and the police copters were ordered to orbit around the outside of the event. It is truly a miracle that there were no mid-air collisions.

Pacoima demonstration was brought ıtrol, so I turned my attention back to the ʏn area. Fire dispatch for South-Central ıged frequencies while I was away—ably to a local tactical frequency, since I : hear any further fire calls on the main frequency. The LAPD and Sheriff's tment frequencies were alive with constant chatter.

The CHP ordered their cars to stay off the way altogether in the affected area. I believe was the first time in the history of the CHP they had done this. The local two meter ham eater was alive with people passing informa- n to hams that were out in their cars.

About this time, the Lakers basketball play- f game finished, and 60,000 fans began the ıive home right through the danger area. A panic tricken fire dispatcher was trying to get police ıelp in finding a fire truck that was missing in the heart of South-Central.

9:45 PM

"Officer down...need help...NOW!" This was on the SWAT team tactical repeater frequency of 506.8375. I locked the scanner on this frequency and waited for developments. This turned out to be one of the most dramatic stories of the riots.

Four LAPD were pinned down in a fire-fight with an unknown number of gang members in Nickerson Gardens, one of the roughest of the gang infested housing projects. Using good military tactics, the gang had seized the high ground, the roof of the building, and had the officers surrounded and trapped in a courtyard. One cop had been hit, and the gunfire was very audible as they kept in constant contact with HQ.

One additional black and white approached the scene, was fired on and had to retreat. Cut off from their cars and equipment, the officers were certainly in the most threatening situation of their lives. An armored car was dispatched with six SWAT members aboard, and I literally rode with them as they approached the scene.

Communication was continuous between the trapped officers, the armored car and SWAT HQ. After being turned back a couple of times, the rescuers were finally able to approach the building behind a volley of automatic gunfire. After about 45 minutes, they reported that they had all four officers alive and aboard the armored carrier and were heading in. Only then did TV coverage start to report this story.

Thursday, April 30 — 12:15 AM

The SWAT frequency was alive with calls as desperate officers found themselves in trouble. None of the broadcast coverage showed police of any kind at the looting scenes. The helicopter frequencies had quieted down, so I took a listen around the AM radio band. Almost every local station was giving non-stop riot coverage and life or death warnings to the populace of LA to stay off the streets. The ironic exceptions were the automated stations playing easy listening rock & roll in the middle of this chaos.

1:15 AM

The scanner was alive with fire, CHP, LAPD Red Cross—almost wherever I tuned there were fascinating radio communications taking place. I was in total sensory overload. I had witnessed alarming and amazing things this night—images I knew I would remember for the rest of my life, but I finally had to get some sleep.

5:45 AM

After a few hours of restless sleep, I had to see and hear what was going on. The rising sun revealed a horrific sight as the live helicopter coverage continued. A high aerial shot on channel seven showed a Los Angeles on fire. Perhaps a couple of hundred fires burned simultaneously, most of them unattended. The body count was beginning to rise after a night of total, uncontrolled violence.

The scanner was alive. The CHP were bringing in reinforcements from as far away as Sacramento. Convoys of CHP were discussing their deployment with the CHP dispatcher. The SWAT frequency once again caught my attention as they were discussing the whereabouts of the missing firetruck and crew from the previous night. This crew was eventually located, unharmed, later in the day.

7:00 AM

The local hospital net was on full alert and the daily 7 AM check-in was quite detailed as area hospitals prepared to receive patients from the riots. Fire dispatch was once again active on 42.46 MHz. The strain on the dispatchers and the crews was obvious. Quite a bit of time was spent trying to deploy the fire crews that were arriving from around the state.

8:00 AM

Thinking that the trouble was still concentrated in the downtown area, I followed my usual pattern and headed onto the freeway for the drive to Beverly Hills to work. As I crested the Hollywood Hills that separated me from the Los Angeles basin, a thick grey pall of smoke blanketed the horizon. The smoke mixed with the usual morning fog and smog seemed to suck all the color out of the day.

The ham repeaters were alive with people checking on their friends and stories related by those closer to the action. One particularly scary story involved a guy and his girlfriend who had been at the Laker game and ran into a gang of rioters blocking the street and stopping whatever

Editor's Note: The procedures detailed in this book are unlawful to perform. The text is intended for educational purposes only. Monitoring Times assumes no responsibility for any liability which may result from the implementation of its contents.

Dan Amaniera

cars came by. He had accelerated into the opposing traffic lanes and just eluded them. Watching in his rearview mirror, he saw the car behind him get stopped and the driver dragged out.

11:45 AM

The broadcast stations were having a tough time keeping up with the breaking stories. A mini-mall was on fire in Culver City, the home of the Sony studios. This was less than ten minutes drive from the office that I had just left on an errand. The fog had lifted by now, and looking south as I drove, I could clearly see fires burning in the distance. The smell of smoke increased as I neared Hollywood.

3:15 PM

The afternoon passed in a blur. I was attempting to get the work finished as soon as possible and thinking about going home early. Around noon, the mayor announced a city wide curfew starting at sundown. The National Guard was also being called in to patrol the streets of L.A. When a fire began burning several blocks from the office, I made a decision to head for home. The owners of the business ran down the halls shouting that they were shutting down and everyone should leave immediately.

5:30 PM

The drive out of Hollywood was very tense. The broadcast stations issued continuous warnings about the imposition of the curfew and the Rapid Transit System shutdown at 6:00. Traffic was unbelievable, seemingly total gridlock. The traffic rules didn't matter anymore, as there were no police around to enforce them.

7:15 PM

The scanner, the Sony 2010, the AM radio and three TV sets were all buzzing. LAPD tac channels were going constantly, trying to coordinate deployment of the hundreds of law enforcement troops that had arrived from around the state. The curfew formally took effect at 7:19. TV interviews of curfew breakers showed that they didn't really believe that it could be enforced.

The SWAT team frequency was alive with calls. The Red Cross frequency of 47.50 MHz was active, trying to coordinate the opening of emergency shelters. As the sun set, the TV coverage showed hundreds of fires burning, looking exactly like scenes of bombed out Baghdad.

7:50 PM

Suddenly, the riots took a new turn. A souvenir store in the center of Hollywood had been looted and was starting to burn. I had passed through that very intersection just three hours earlier on my way home. The store burned furiously throughout the rest of the night. Fire trucks did not respond for hours. The famed lingerie store, Frederick's of Hollywood, was cleaned out, and the store next to it was set ablaze.

9:30 PM

The curfew seemed to be having little effect on the spread of the violence. The Guard was nowhere in sight. TV coverage showed shots of the LAPD, looking on helplessly, as a store was ransacked behind them by hundreds of looters. Feeling that the police were not protecting them, some Koreans formed armed squads and took up positions on the rooftops. This became a major topic of discussion on the LAPD tac frequency.

More and more CHP were being used to escort firefighters into the worst areas. News reports told of a few gang members who had been caught setting some fires. They said that they were part of an organized gang effort whose goal was to set 10 fires per hour.

10:00 PM

I needed a break, so I tuned the Sony to the shortwave broadcast stations to see if they were covering this story. BBC world news was talking about nothing else. Quickly tuning around, I realized that this situation was making news around the world. All the English language newscasts were concentrating on the riots and the violence that was simultaneously breaking out in several American cities.

10:15 PM

The violence was now affecting an area of more than a hundred square miles. Checking on the local LAPD dispatch, I found that they were deploying some personnel to protect the large shopping malls, an obvious target.

The fire frequencies were remarkably quiet. On later analysis, I realized that there was no point in dispatching a fire crew to a new outbreak when all available personnel were already in action. As soon as a crew was finished with one fire, they were immediately sent to another. I heard an LAPD officer ask the dispatcher where the Guard was—they needed some reinforcements. The dispatcher in obvious frustration gave a less than professional response.

Friday, May 1 — 6:00 AM

Despite the curfew, the looting and burning had continued throughout the night. The big news, as the sun rose, was that the National Guard was finally being sent out into the streets. As they began to appear on street corners, in full Desert Storm combat gear, and armored personnel carriers, I felt for the first time that perhaps the riots could now be brought under control.

I started looking for tac frequencies that the Guard might be using, but since my scanner doesn't cover the Federal bands, I didn't hear any. Checking around on the forty meter ham band, I heard many stations trying to contact LA At no time was the phone service interrupted, so there was little use in trying to pass health and welfare messages via amateur radio.

7:15 AM

The CHP was announcing that it was closing the freeway that passed through South-Central. Apparently they had trouble keeping these on and off-ramps closed, as there were several calls throughout the morning instructing cruisers to take traffic cones to one or another of these ramps.

The dusk-to-dawn curfew was being extended indefinitely. The sale of ammunition was illegal, and you could not pump gasoline into any container other than your car. Helicopter coverage showed an area of perhaps 20 square blocks where virtually no buildings were left intact.

8:00 AM

In the couple of hours since dawn, the situation seemed to calm down. The rioting and crowds pretty well stopped once the military showed up, and though new fires were still breaking out, there was now personnel to fight them. Since I didn't feel that I was near the danger zone, I decided to head into work. The freeway was nearly deserted and I reached my office in 25 minutes instead of the usual hour. Driving through empty city streets I felt as if I had stepped into a science fiction movie.

Continued on page 107

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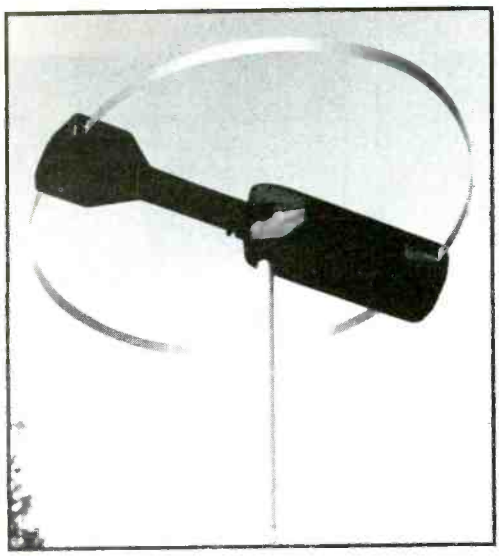

The IsoLoop 10-30 HF antenna is designed to work in limited space applications — apartments, condos, etc. Don't be deceived by its compact size (43" diameter) — it really works! Features include: Continuous coverage from 10 to 30 MHz; narrow bandwidth to suppress out-of-band signals; comes fully assembled (no mechanical joints); much more.

For complete information on these or any other AEA products, call the toll-free InfoLine at (800)432-8873.

The PK-232MBX is a must for the digital Shortwave Listener. By far the most popular multi-mode controller ever, it can receive seven different types of data signals including Morse code, Baudot, ASCII, TDM (Time Division Multiplex), WEFAX, NAVTEX and Packet. It also features: The indispensible SIAM which automatically identifies many types of digital signals; superior software support for PC compatible, Macintosh and Commodore 64 and 128 computers.

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INTRODUCING The Grove SW-100

Production model may differ slightly in appearance

By Bob Grove

The Evolution

It started out simply enough. Why couldn't Grove Enterprises—a small American company—design a high performance, general coverage receiver that would compete with the Japanese imports? That was in 1984. Eight years and a quarter of a million dollars later, we've learned a lot about consultant engineers!

For example, you can't assume that long-distance consultants are working conscientiously and diligently just for you. They may put on a good show and write a good resume, but when it comes to delivering the goods, some know their stuff and others don't. And any time or cost projection quoted by a consultant should be doubled—at least!

By 1990 the SR-1000 dream receiver looked great—on paper. Wide frequency coverage, built-in spectrum display...but when two independent reviewers looked at the drawings and agreed it wouldn't work, things changed. Grove redoubled their efforts with a new perspective and drew up plans for the SW-100 instead.

A New Concept in Receivers

The modular design of the SW-100 permits the owner to upgrade as he wishes without having to pay for features he will never use. Shortwave enthusiasts can enjoy uncompromised 10 kHz-32 MHz performance, while those who wish to extend their listening to the gigahertz range will be able to do so with a continuous-coverage converter.

Originally 100 memory channels were planned to store frequencies, modes, filter bandwidths, channel numbers and lockout; but when it was discovered that the cost for 1000 channels was only slightly more than for 100 channels, the decision was made to give the customer the 1000 at no extra charge.

Then there was the decision about selectivity filters. Quartz? Ceramic? Mechanical? SAW? Hybrid? The options were bewildering. After studying the results of NASA tests, federal government specifications and examining the most popular bandwidth characteristics on high-end radios, a combination of quartz and high-grade ceramic was chosen.

One of the most common receiver complaints is strong-signal overload and its attendant spurious signals and desensitization; this is why manufacturers put attenuators on their receivers. Extraordinary design efforts went into this aspect alone.

The resulting wide dynamic range with no sacrifice in sensitivity meant that no attenuator switch or RF gain control was needed, making the SW-100 simpler to operate and more dependable.

The meter and LCD readout had to be custom made, and the details that go into an LCD with over 100 connections are staggering! Thousands of component layout decisions have to be made to assure optimum performance under every conceivable condition. When circuits are not routed right, receivers become noisy and erratic.

But the effort was worth it. The SW-100 will set a standard for some time to come, and its American identity means a great deal to consumers.

The unveiling of the SW-100 at the Dayton Hamvention drew a great deal of attention. Nervous off-shore manufacturers were taking pictures and asking questions; dealer and distributor inquiries from around the globe began arriving at Grove headquarters; more than one federal government agency is evaluating the SW-100 for primary monitoring.

At press time, a September delivery is expected with a manufacturer's suggested retail price of $899. Hopefully, the schedule will hold during the inevitable last-minute pruning of final details. The SW-100 is anxiously awaited by the monitoring community—and by Grove Enterprises!

When that times arrives, a production model will be provided to an independent source for in-depth review in *Monitoring Times*.

nary Specifications at Press Time

cy Range: 10 kHz-32 MHz
y: 1000 channels store frequency, mode, selectivity, channel
nber, lockout
0 channels per second (varies with mode and frequency) with 2
cond delay; A/B VFO automatically follows split-frequency com-
unications
ency Readout Accuracy: 10 Hz (5 decimal places)
r Frequency Tuning Indicator: LED
uency Accuracy: +/- 5 ppm
itivity (10 dB SINAD SSB, 50 ohms): 0.5 microvolts (8 dB) or better
amic Range: 80 dB
rmodulation (3rd Order Intercept Point): +15 dBm min.
age/IF Rejection: 90 dB min.
ectivity (2:1 shape factor, -6/-60 dB): AM/SSB wide 6.0 kHz, medium 3.0 kHz, narrow 2.4 kHz, sharp 1.0 kHz*; FM wide 150 kHz*, medium 30 kHz*, narrow 15 kHz, sharp 6.0 kHz
uning Steps: AM, 100/1000 Hz; AM synch/SSB, 10/100 Hz; NFM, 2.5/12.5 kHz; plus user defined 10 Hz-1000 kHz
Conversion Scheme: Up-converted triple superheterodyne (45 MHz, 10.7 MHz; 455 kHz)
AGC: 10 mS attack, 10 mS AM/FM decay, 500 mS SSB decay
Receiving Modes: AM, AM synch, USB, LSB, NBFM, ISB*; RTTY, CW, FAX in USB or LSB modes
Noise Limiter: Low distortion pulse clipping
Overload Protection: Induced lightning and signal overload
Tone control: Bass/treble adjust
S Meter: D'Arsonval movement registers S units and microvolts
Display: Backlit LCD
Notch Filter: Reduces tone interference 40 dB from 450-5200 Hz
Squelch: Signal activated, all modes
IF Output: 45 MHz @ 0 dB; 2-32 MHz BW @ 15 MHz dial set
Power Requirement: 12 VDC @ 1 A; 120 VAC adaptor included
Operating Temperature Range: 10 to 30 C (50 to 86 F)
Storage Temperature Range: -40 to +80 C (-40 to +176 F)
Recorder Activator: Sinks 12 VDC @ 1 A
Record Output: 600 mV @ 1000 ohms
Audio: 4 watts @ less than 10% THD into 4 ohms
Internal speaker: Top mounted, 4" full fidelity
Earphone Jack: 1/4", 4-16 ohm, anti-blast protected
External speaker jack: 1/8"
Dimensions: 4"H x 9"W x 8"D; rack mountable
Weight: 5 lbs.

*Options and Accessories (Check for availability)

- 32-1000 MHz frequency extension module (includes WBFM filter)
- RS232C interface with squelch and signal strength lines
- 1000 channel memory
- 12 VDC mobile cigarette lighter power adaptor
- 120/240 VAC 50/60 Hz power supply
- ISB detection module
- 19" rack mount kit
- Carrying handle
- 21.4 MHz IF output converter for SDU or ISB adaptor
- 10.7 MHz IF output converter for SDU or ISB adaptor
- 500 ohm balanced audio line output
- 30 kHz medium FM filter
- 1 kHz sharp CW/RTTY filter
- Dust cover
- Rechargeable battery pack
- Tunable BFO

MT

Shortwave Broadcasting

Glenn Hauser
Box 1684-MT
Enid, OK 73702

AFGHANISTAN (non) Radio Message of Freedom, controlled by the Islamic Party of Afghanistan, scheduled at 0145-0315, 1400-1500, but also heard at 0930 on 7091.5-variable; gave address as Pakistan, Peshawar, University Town CPO Box 857. Voice of Afghanistan, 1415-1515 on 7125; 0130-0245 and 1315-1415 on 6146; address is GPO Box 1207, Peshawar, Pakistan (BBC Monitoring)

ALASKA KNLS in English at 1300-1400 on 9660 was blocked by FEBC and Brisbane; finally moved May 9 to 11580, barely audible but in the clear (gh, NM and John Norfolk, OK)

ALBANIA Radio Tirana is suffering shortages of electricity and even paper. The German organization, AGDX, has printed QSL cards and sent them to the station (Wolfgang Bueschel, *Weltweit Hoeren*) RT has two SW sites, with 25, 50, 100 kW transmitters, directional and omni serials, the station announced (BBCM)

ANGOLA Huila was again active on 4820.0 from 1500 past 2000; regulars were Luanda around 4950.4 and Benguela on 5041.3 and 6153.8 with local program starting at 2133, as of late May (Vashek Korzinek, South Africa, via Dario Monferini, *World of Radio*)

ARGENTINA Radio Nacional shifted its unexplained 11-meter outlet to 26299, well heard at 2330; Radio El Mundo, Buenos Aires, also appeared on 26099 at 2200 (Alan Roberts, PQ, *W.O.R.*)

ARMENIA DST of UTC+5 went into effect May 3 to save electricity, so domestic schedule becomes: First program, mostly in Armenian, from 0200 on 6065 and irregular 4810, 4040; 0553 and 7175 via Moscow; from 1259 on 7175 and 4040 irregular; 1559 change to 17705 via Moscow, also announced on 15100, and 4040-irregular until closing at 1900 (BBCM) External service at 0230, not 0330 on 15580, with English around 0250 (Eric Swedberg, OR, via Bruce MacGibbon, Radio Japan *Media Roundup*)

BELARUS Radio Mahileu (ex-Mogilev) on 5430 opening with local ID at 0330 (Finn Krone, Denmark, *Play-DX*)

BENIN ORTB heard around 1800 on 5024.5, probably really 5025 as had to tune lower to avoid Uganda 5027 (Nobuaki Takahashi, Japan, RJ*MR*) Unconfirmed; normally on 4870.

BOLIVIA Two stations relaying Radio Fides news at 1100 are Radio Maria Auxiliadora on 4975 and Radio Santa Cruz on 6135 (Emilio Pedro Povrzenic, Argentina)

BOTSWANA With four transmitters now in use, VOA relay schedule becomes more complex; only two antenna headings are 10 degrees east and west of due north: 7265 and 7280 at 0300-0500; 9885 at 0300-0430, 0500-0700; 11940 at 0300-0430; 15370 at 2200-2300; 15375 at 0430-0700; 15445 at 1800-1900; 15495 at 1600-1800, 1900-2200; 15600 at 0500-0700, 1630-2300; 17650 at 0430-0700, 1600-2200; 17705 at 1630-1830; 17870 at 1830-2300. Languages are English, Portuguese, French, Swahili, Hausa and Amharic (*W.O.R.*)

BRAZIL Normally inaudible North American service in English of RadioBras at 1200 on 11745 was confirmable May 10-11 thanks to solar storm, usually blocked by Taiwan (Bill McClintock, Minneapolis) During the Earth Summit, we found a surprise (better) frequency for this until 1320, 15445 (gh, NM) Radio Novas de Paz, Curitiba, at 0400-0500 on new 6100 ex-6080 (Vashek Korzinek, RSA, via Monferini)

BULGARIA Radio Sofia's summer schedule in English: 1100-1230 on 11630; 1730-1900 on 17825, 17780, 15330, 11765, 11720, 9700; 1945-2030 on 17825, 17780, 11765; 2145-2315 on 15330, 11720, 11660; 0000-0045 same; 0300-0430 on 15160, 11720, 9850 (BBCM and John Norfolk) DX programs seems to appear Fridays about 30 minutes and 45 minute segments (Norfolk)

CANADA Scheduling of some CBC programs via RCI: *Air Farce*, Sundays 1900, 2130, 2200. *Quirks and Quarks*, Saturday 2100, UTC Sunday 0000, 1800, 2300. *Coast to Coast*, Saturdays 2300. *Centerpoint*, Sunday 1400 and 2100. RCI's magazine of CBC items, *Spectrum*, is on weekdays at 1800, 1930, 2130—times approximate, most actually following news (via Bill Westenhaver, *DX Listening Digest*)

CIQX, 6005, Montreal, simulcasting CIQC, 600 has contemporary format including overnight *Star Country Network* as early as 2200, as late as 1100; local country shows hosted by Ted Silver weekends, Jim Connell and Dennis Bell weekdays; *Elvis Hour* Saturdays at 1600; *Gardening Show* Saturdays at 1200-1300; *Montreal's Talking*, weekdays 1300-1500; *Pulse News*, simulcast of CFCF-TV, weekdays 2200-2300 (via Bill Westenhaver, *ibid.*)

CHINA Radio Beijing published summer schedule effective May 11, still showing Mali on 9770 and 11715 at 0000 and 0300, which were confirmed; direct on 9665 at 1200, but really on unannounced 15210. At 1300 and 1400 back to usual summer channel of 11855. (*W.O.R.*) At 2225 in English on 21630 and 21600 (William Kitching, England, WDXC *Contact*) Never used this band before; site? Third harmonics?

Fuzhou PBS, Fujian, 2340 kHz, audible between 1145 and 1315, best during the 1200 hour (Warren Chamberlin, CA)

COLOMBIA DST normally not observed in tropics, but adopted here May 3 perhaps to save electricity; helps us to hear more stations in the mornings with earlier sign-ons, such as 0800 instead of 0900 for La Voz del Cinaruco, 4865; La Voz del Rio Arauca, 4895; La Voz de los Centauros, 5955 (Emilio Pedro Povrzenic, Argentina, *W.O.R.*) Blame El Ninyo current and climatic changes (Henrik Klemetz, *Play-DX*) Radio Buenaventura, 4833.01, occasionally active from 0916 past 1000 with full ID. Radio Ondas del Orteguaza presumed on 4978.93 from 1037, fade before 1100 ID (Chuck Bolland, FL)

Radio CARACOL back on 5075 instead of 6075 at 2358, also on 6150. Radio San Jeronimo again with non-stop ranchera music on 5873.60 at 0015 past 0200 with BBC gone from 5875. San Jeronimo not found on maps (Juan Carlos Codina©, Peru, via Monferini)

COMOROS Even if "heard" in Germany, SW here is still inactive (Korzinek, RSA via Monferini)

COSTA RICA Earthquakes and then repeated floods washing out bridges have slowed activation of Cahuita site by AWR; also expensive tubes and transformers burnt out. Maybe God is trying to tell us something (*Costa Rica Today* on AWR) 5030 was on by late May, 0000 in English (Don Thornton, NJ, *W.O.R.*) One Saturday after 0430 on 7375 during *Mailbag*, we heard RFPI interfered by a ham on exactly same frequency, K5QWD, listed as Marshall, Texas, calling CQ. Perhaps an innocent mistake, but what was his transmitter doing on 7375, which has been subjected to lots of unidentified jamming? (*W.O.R.*)

CROATIA (non?) Zagreb on new 5085 at 1830 and 0445, probably all-night. Sounds like Deutsche Welle; can anyone confirm European relays outside Croatia? (Dario Monferini, Italy)

CUBA An old 30-kW Siemens, no longer needed for telephony, is being refurbished for worldwide SSB by RHC; will start testing weekends (Arnie Coro, RHC *DXers Unlimited*)

CZECHOSLOVAKIA Radio Czechoslovakia tries some new frequencies this summer, for us: 0000 on 7345, 9580, 11990; 0100 on 5930, 7345, 9580; 0300 on 7345, 9810, 11990; 0400 on same plus 13715, 15355 (via Bill Westenhaver and Bob Thomas)

CHILE Radio Esperanza, 6088.55, heard at 2349 past 2400; and Radio Santa Maria, 6029.7 at 0018, ID on the half hour, blocked by carrier at 0043 (Hans Johnson, MD, *W.O.R.*)

Shortwave Broadcasting

MINICAN REPUBLIC Radio Santiago on 9877.5 at 0316- :luding English ID at 0345; carrier stayed on past 0400 and drifted) 9877.1 (Bill Flynn, OR) Varied 9877.6 to 9877.8, opening at :overed by Austria 2358-0256, audible again until 0356 (Brian ıder, PA)

CUADOR Correct name of the Onya station on 4212.1 is Radio lel, not Tucuben; 500-watt transmitter on nominal 4220 was unli- :d and ordered off the air, but may come back on a new legal channel ayuki Inoue, *Relampago DX* via *Radio Nuevo Mundo*) Printed ıdule shows HCJB would move its 24-hour SSB to 17895, but still d on 21455 (Andy Sennitt, Holland, Radio Netherlands *Media work*)

Centinela del Sur, 4890, still uses 4870v many evenings, perhaps to oid Peru's loud Radio Chota (Richard McVicar, Quito)

EQUATORIAL GUINEA Radio Africa, 7190.33, English :ligion on a Saturday 2215 to 2301, closing at 2255 with California ıddress, T-shirt offer for $20; very strong (Alexander, PA)

FRANCE In English to us at 1230, RFI replaced 21635 with 15365, still on 21645 (Bill Westenhaver, PQ, *DX Listening Digest*) RFO news review for Antarctica is still on schedule, Mondays 0805-0835 on 11660 direct from France (BBCM)

GEORGIA Radio Georgia confirmed in English at 2030-2100 on 11760.3 (BBCM)

GREECE VOG in English at 1530 on 23290, double 11645 (Wolfgang Schweikert, Germany, DSWCI *SW News*)

GUAM *DX Asiawaves* on AWR yields reliable reception in North America, UTC Sundays at 2315-2330 on 15610 (Bob Padula, *ADXN*) Not a trace of it here when we checked (gh, NM)

HAWAII LeSea, operator of WHRI Indiana, plans to put on 100 kW station at south tip of Big Island by end of anniversary year 1993 at the latest; 100 kW Harris, TCI curtain at 270 degrees, slewable +/-15 or 30 covering Sydney to Tokyo; call KWHR (RN*MN*)

HUNGARY Relays of RFI in French are now: 0500-0600 on 11850, 0500-0800 on 15530, 0600-0800 on 17690, 1600-1800 on 15460 (via Wolfgang Bueschel, *WWH Weltschau*)

INDIA AIR's latest schedule, May, still shows no North American service, so here are all the others in English now consolidated into less confusing time blocks: 1000-1100 on 21735, 17895, 17387, 15050; 1330-1500 on 15120, 11760, 9665; 1745-1945 on 15080, 11935, 11860, 11620, 9950, 7412; 2045-2230 on 15265, 11715, 11620, 9950, 9910, 7412; 2245-0045 on 17830, 15145, 15110, 11785, 11745, 9910 (via Kevin Klein, WI)

IRAN VOIRI announced English schedule is 1030-1130 on 11930, 11910, 11790, 11715, 9525; 1830-1930 on 15260, 9022; 2330-2430 on 15315, 15260, 9022 (BBCM)

IRAQ RII rapidly expanded and retimed its external services, including some English. 0600-0800 on 13680, also announcing 7240, 15385, 15400, to Arab world; English news at 1226 on 11960; 1300-1600 all-English on 15400, 11250, target unknown; 1800-2300 on 15210 to Europe with English at 1801-1929, 2144-2157; 2300-0200 on 15150 to Venezuela, 17740 to Brazil and Argentina, English around 0042-0056; 0100-0400 to "Chicago" on 15340, English at 0243-0256—such times vary widely (Combined reports from Bill Westenhaver, BBCM, Brian Alexander, Daryl Rocker, Bill McClintock, Leigh Morris in *ADXN*) Also on 15050 dual 17740 at 0010, horrible modulation; and domestic service in Kurdish on 6560.2 instead of 6540.2 opening at 0127 with clucking chicken (Hans Johnson, MD, *W.O.R.*)

(non) Voice of Rebellious Iraq, pro-Iranian Shiite, 0330-0600, 1130-1400, 1630-1900 on 8000 or 8010 instead of 6330, mainly Arabic, but Kurdish once at 1830-1900 (BBCM)

JAPAN Radio Japan's 2nd-quarter schedule deleted *Media Roundup* from the Sackville relay, forcing eastern North American listeners to search for it elsewhere—Sundays 0330 on 17810, 15230; 0930 and 2130 to Asia; 1530 on 11865 only direct to western North America; 2330 including Gabon relay on 11735. Could be back via RCI after July 1 (via Bill Westenhaver, *DXLD*) see also UKOGBANI.

KOREA SOUTH Radio Korea has started simulcasting KBS Radio One domestic on shortwave, 2200-0400 on 9525, preceded by RK IS at 2155; IDs as HLKA on the hour (Radio Japan *MR*)

KURDISTAN (non?) Iraqi Kurdistan Radio, socialist, changed name to Kurdistan Radio, the voice of unification, on 4130 from 1600 in Kurdish, 1720 in Arabic, repeated at 0300 (BBCM) Voice of Iranian Kurdistan, 4065 at 0230, jammed after 0239; also 1630 in Persian, 1700 Kurdish, 1800 Persian (Tetsuya Kondo, Greece, Radio Japan *Media Roundup*)

MOZAMBIQUE Maputo reactivated 11817.5 for English at 1100, but bad modulation; in Portuguese at same time on 9618.3 (Vashek Korzinek, RSA, via Monferini) Voice of Renamo, clandestine, announced it would also broadcast to resistance forces at 1045-1145 on 9860, but not confirmed (BBCM)

NAMIBIA NBC heard after 0600 on 6060 and 6175 in parallel (Korzinek, RSA via Monferini)

NETHERLANDS RN from Flevo to South Asia at 1330-1625 shifted 17605 to 17650 (RN*MN*)

NETHERLANDS ANTILLES RN mixing product, the difference between 11835 and 6165, audible 0100-0125 on 5670 until 11835 closed (Brian Alexander, PA)

NEW ZEALAND Kiwi Radio, pirate in Hastings, plans tests at 0600 on 5850 July 18, August 29, September 26, the first date also on 6060, the others also on 6220. Graham Barclay inquires about attending the *MT* convention (Gigi Lytle, Lubbick TX)

PALAU By late May, High Adventure's Voice of Hope for Asia had increased power on 9830, easily heard in Chinese around 1330 past 1500, though blocked by English numbers after 1354 Monday on 9831. Calls KHBN never heard, and may not apply; correct address announced is Box 66, Koror, Palau, 96940 (gh, NM) Also active on 11980, but not strong at 2200 (Craig Seager, *ADXN*)

PERU Ondas del Suroriente, Quillabamba, 5068.70, relaying long newscast from Radio Programs del Peru—RPP at 0000, some local ads (Juan Carlos Codina©, Lima via Dario Monferini) Radio Santa Monica, Santiago de Chuco, opening at 1030, rarely heard in morning, on 6670v (Emilio Pedro Povrzenic, Argentina) Radio Frecuencia San Ignacio, 5700, frequency IDs around 0230, huaynos (Hans Johnson, MD)

POLAND Polskie Radio Warszawa shifted one hour earlier for DST, making English even less likely to reach North America: 55

Shortwave Broadcasting

minutes at 1200 on 11815, 9525, 7145, 6135; 1500 on 11840, 9525, 7285; 1700 on 9525, 7270; 1930 on 9525, 7270, 7145, 6135, 6095.

PORTUGAL Lisbon finally out of band on 17495 to Timor at 0700 weekends, parallel 21700 and 21655 (Bob Padula, *ADXN*) Includes mass on Sunday at 0900 also on 9615, 9740, 11800 (Noel Green, DSWCI *SW News*) AWR DX news via Italy listed here last month changed times on Sundays: 0615 on 7205, 0945 on 7230 (Wolfgang Bueschel, Germany, *WWH Weltschau*)

ROMANIA RRI recommends feature programs on 1900, 2100 and next UTC day 0200 one-hour broadcasts: Monday, *History, Tourist News, Romanian Hits, Radio Amateurs*; Tuesday, *Youth Club*; Wednesday, *Friendship and Cooperation, Romanian Musicians*; Thursday, *Letterbox* and *Folk Music*; Friday, *Cultural Survey*; Saturday, *Romanian Literature, DX Mailbag*; Sunday, *Letterbox*, interviews, *Romanian by Radio, Philatelic Agenda* (fortnightly). On the 0400-0430 broadcast, North American days: Monday, *History*; Tuesday, *Youth Club*; Wednesday, *Economic Agenda*; Thursday, *Current Affairs*; Friday, *Romanian by Radio*; Saturday, *Philatelic Agenda* or *RRI Encyclopedia*; Sunday, *Essay, Radio Pictures*.

RUSSIA Adventist World Radio added another relay here, 1620 in English, 1730 in Scandinavian languages on 15125 (Marcel Rommerts, RN*MN*) Same at 0430-0500 (*Austrian SW Panorama*)

Radio Ala address is P.O. Box 159, Moscow 125047; is 24 hours, free-form with guitar music of the bards, news and IDs at variable times (Vladimir Titarev, Ukraine, WDXC *Contact*) At 0000 on 15255, 11925, 7370, 7315, 6015, 5040, 3995; 0200 replace 7315 with 11685; 0500 on 12030, 11965, 11925, 11685, 7400, 3995; 1400 change to 7400, 7380, 7370, 6025, 6015, 5040, 3995; 1600 to 7370, 6015, 5040, 3995; 2000-2400 add 7315, 6025 (BBCM)

Radio Aleph (see last month) is prepared by Jewish Children's Association, Tuesday, Thursday and Sunday, not Saturday (BBCM)

Radio Beryozovo has local program Sunday at 0415-0500 on 5070 (Alexey Osipov, *Play-DX*)

Chuvash Radio, Cheboksary, 9875 has local program at 0315-0400 and 0415-0430 Monday-Saturday, 0430-0500 and 0515-0600 Sunday (Osipov, *Play-DX*)

Deutsche Welle's summer schedule of "Soviet" relays: Irkutsk 1100-1150 on 15350. Novosibirsk 0100-0150 on 15535, 1000-1400 on 15560, 1200-1320 on 15350, 1600-1650 on 9875, 2200-2400 on 11795, 2230-2320 on 12045. Zhigulyovsk 0200-0250 on 15560, 0300-0350 on 15560, 0800-0850 on 17675, 1000-1050 on 17735, 1400-1800 on 13690 (via Kevin Slater, OR, *W.O.R.*)

Evenk Radio, Tura, operates at 0030-0145 on 4040 (Alexey Osipov, *Play-DX*)

Karinska Radio, 21800 at 1140 with pops, 1200 ID (Geoff F. Williams, UK, WDXC *Contact*)

Murmansk Radio, 5930, 6050, 15350, local program includes weekdays 1500-1530 (Osipov)

Adygey Radio, Maykop, Fridays 1730-1800 on 7305, and alternates 7130, 5905; Kabardino-Balkar Radio, Nalchik same on Sundays, in local languages (BBCM)

Radiostantsiya Pamyat, 1330-1500 on 12030 Yekaterinburg, 1500-1800 on 11665, 2200-2330 on 6145 (NDXC via *ADXN*)

Tatar Radio, Kazan, Radio 1 and local program uses 6120; also via Samara 6115 daytime and 11905 evenings; via Perm' 3 kW 7185 daytime, 15200 evenings; Moscow 11945 daytime, 17810 evenings. Perm' Radio itself, 3 kW, carries Kazan on 7185 at 0200-1745, 15200 at 1800-2100; Perm' and Kudymkar programs on 6165 at 0100-1340, 11770 at 1400-2000 (Osipov, *Play-DX*)

Radio Society, Tatarstan, on 9635 at 0600 (Anatoly S. Klepov, Moscow, WDXC *Contact*)

Radio Vedo monitored Monday-Friday 1400-1800 on 9655, 11760, 13710, including some English; rest of schedule unconfirmed (Y. Kato, Radio Japan *Media Roundup*)

Radiostantsiya Yakutsk seems new, 0600-1400 on 5925, 6120 (*NDXC Newsletter* via *ADXN*)

SAUDI ARABIA (non) Holy Medina Radio, anti-Saudi believed from Iraq, heard on 9630 at 1935 past 2030; later on 11860, same channel as Voice of the Kinfolk, at 1600-2000 and 0500-0900; frequency varies (BBCM)

SPAIN REE's Sephardic, or Ladino broadcasts are Thursday 1805-1835 on 11890, UTC Friday 0232-0252 on 9620, 0415-0435 on 9690 (REE) Spanish program from Tenerife, Canary Islands, is daily at 2200-2300 on 6125 (BBCM)

SRI LANKA Voice of the Tiger, Tamil clandestine from Jaffna, resumed SW after two years on FM only, testing 7030 SSB at 0200, especially weekends (Victor Goonetilleke, RN*MN*)

SWITZERLAND *Red Cross Review*, no longer on schedule distinct from SRI, has been found within SRI programming, second half of English half-hours the last Thursday of the month in April, following UTC Friday to North America such as 0215 and 0415 on 6135, 9885, 12035. Other months it could be on the first Thursday (Mike Schulsinger, OH) Confirmed Thursday May 28 at 1320 on 7480 via China (gh, NM)

TAIWAN VOFC announces a US address: P.O. Box 192793, San Francisco, CA 94119-2793.

THAILAND Radio Thailand's best frequency, 9655, was blocked by Radio Australia which moved there from 9475 at 0900-1430; announced and listed 11905 not heard in almost a year, heavy jamming (Victor Goonetilleke, Sri Lanka, RN*MN*) From China versus Taiwan.

UKOGBANI Radio Japan's relay via BBC Skelton officially starts July 1, but was tested the first half of June on 9670, 9695, 9770 between 0400 and 0900; 6025, 6110 and 6160 between 1930 and 2430 (RJ *Media Roundup*)

USA *World of Radio*, with your columnist, is scheduled on WWCR: Friday 2115 on 15690, UTC Sunday 0305 on 7435, 1000 on 15690, Monday 2045 on 15690; on WRNO, UTC Sunday 0000 on 7355, 2030 on 15420; on RFPI, Costa Rica, Sunday 2300, Monday 0700, Tuesday and Saturday 1900, Wednesday and Sunday 0300, Friday 2000, Saturday 0400, on 7375, 13630, 15030, 21465; also on WNQM, 1300, Nashville, UTC Saturdays 0500.

KJES, the inactive SW station near Vado, NM, is making little progress; engineers are awaited to fix antenna and transmitter; no staff has been hired, but eventual programming should be ecumenical, not just Catholic.

White noise has hit WHRI on 9495 between 0100 and 0500 during Cuban American National Foundation programming only, so Cuba has started SW jamming (George Jacobs, RN*MN*) Sounds about the same as a bad feed line (gh) I've yet to hear any SW jamming by Cuba against this, Radio Marti, or any other exile program; would waste electricity, and skywave jamming would be difficult within the island (Tim Hendel, Miami)

Radio Miami International is installing the Clarin transmitter; will test first on 9955 sometime during third quarter. Meanwhile, heavy schedule of exile programs continues every night, mainly on WRNO 7355 between 2300 and 0300, with a break for *Miami en Vivo*, mailbag, music and DX Tuesday-Saturday at 0045-0100 (via Jeff White, RMI)

VOA's 47th language, Kurdish, is at 0300-0315, jammed on 5965, 7105, 9540, 11830 (Bill Whitacre, VOA, RN*MN*)

VIETNAM Radio-TV Kon Tum is new on 5061 at 1045-1100 and from 1130 but China 5060 blocks then. Radio Yan Bai on new 6370 ex-6461, 1130-1215 (Isao Ugusa, Radio Japan *MR*)

YEMEN Aden on 7189.93 from 0300-0335; same date San'a on 9799.74 from 0301 to 0335, separately in Arabic (Brian Alexander, PA)

"YUGOSLAVIA" Radio Yugoslavia carries UN Peacekeeping program in English at 1850 on 15140, 6100 (*Austrian SW Panorama*)

Broadcast Loggings

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

0018 UTC on 9710
LITHUANIA: Radio Vilnius. Report from Latvia and Estonia on the cost of living for farmers. (Robert Tucker, Savannah, GA) Audible on 17605 kHz at 0000 UTC. (Michael Miller, Issaquah, WA)

0027 UTC on 9930
BELGIUM: BRT. Station interval signal and station ID at 0030 UTC. Newscast to "Brussels Calling" and "Belgium Today" programs. (Tucker, GA) (Sam Wright, Biloxi, MS)

0040 UTC on 11715
MALI: Radio Beijing Relay. "Learn Chinese" program on family life. Parallel heard on 9770 kHz. (Bob Fraser, Cohasset, MA) Mali's RTV Malienne in Bamako, heard on 4835 kHz at 1850 UTC. French and English programming. (Allen D. Marshall, Greece)

0055 UTC on 4905
BRAZIL: Radio Relogio Federal. Portuguese. Announcer chat to station ID. Time pips at 0059, music bridge, and canned ID at 0100 UTC. Classical instrumentals and cultural programming. Brazil's Radio Alvorada heard on 4965 kHz at 0227 UTC in Portuguese. Soccer commentary and occasional IDs or promotionals heard. (Brian Schaft, Berea, OH)

0100 UTC on 17690
UKRAINE: Radio Ukraine. News and program features on "Ukrainian Orthodox Church," and "Ukrainian Composers." (Betsy Robinson, Clinton, TN) Radio Moscow's Ukraine relay heard on 15510 kHz at 1905 UTC. (Tucker, GA) Radio Kiyev heard on 5960 kHz at 2200. (Gasque, SC) (Miller, WA)

0120 UTC on 4830
VENEZUELA: Radio Tachira. Spanish. Easy-listening Spanish vocals to 0125 UTC. "Tachira" ID with music intros. Spanish ballads, and time checks. Ecos del Torbes heard on 4980 kHz at 0235 UTC. (John Goudreau, Monroe, LA)

0133 UTC on 4845
MAURITANIA: ORTM. Arabic. Lengthy script read. Music bridges separate program portions. Arabic music, news, and prayers. Extended programming monitored to 0250 UTC. (ED)

0155 UTC on 4885
COLOMBIA: Ondas del Meta. Spanish. Coffee ads and upcoming news introductions. Station ID at 0159, followed by newscast, and continued commercials. Colombia's La Voz del Rio Arauca heard on 4895 kHz at 0205 UTC. News, ID/ frequency quote, time check and musical jingles to tune-out. (Goudreau, LA)

0300 UTC on 9690
CHINA: Radio Beijing. World and national news. Program on China's small villages. (Norman Anderson, Santa Ana, CA) Parallel programming heard on 9770 kHz at this hour. (Miller, WA) (Schaft, OH) (Goudreau, LA)

0330 UTC on 7970
UKRAINE: Radio Kangola Volmonevia. Russian pop/rock music and English/ Russian talk, possibly a domestic service. Radio Ukraine heard on this frequency at 0030 UTC next evening. This frequency is a former Radio Moscow relay transmitter. (David A. Gasque, Orangeburg, SC)

0338 UTC on 15565
CLANDESTINE: Iran's Flag of Freedom Radio. Farsi. Extended text read about Iran by male announcer. No parallel frequencies audible. (Schaft, OH)

0400 UTC on 11835
NETHERLANDS: Radio Netherlands. International news to station ID. Shortwave information and "Propagation Report." (Anderson, CA) "Happy Station" heard on 13700 kHz at 2030 UTC. (Fraser, MA) (Miller, WA)

0442 UTC on 15230
SOUTH AFRICA: RSA. News feature on South Africa's agriculture. Music tunes, national news summary, and station sign-off signal at 0455 UTC. (Tucker, GA) (Glenn R. Bowman, Alexandria, VA) Heard on 11950 kHz at 2100 UTC. (Fraser, MA)

0500 UTC on 11588
ISRAEL: Kol Israel. National news of Israel. (Tucker, GA) "Calling All Listeners" program heard on 11585 kHz at 2015 UTC. Discussion on using cancelled postage stamps for hospitalized children's crafts. (Fraser, MA)

0559 UTC on 14917.7
KIRIBATI: Radio Kiribati. English/Kiribatese. Station sign-on melody of piano music. BBC news relay and regional news topics in Kiribatese. Fair signal with occasional fading. Island style vocals and pop tunes. (Earl Bailey, Oakland, CA)

1220 UTC on 6070
CANADA: CFRB/CFRX. Weather, financial news, and commercial for Financial Post. Toronto Blue Jays baseball scores and newscast at 1230 UTC into commentary. (Tucker, GA) BBC World Service Relay heard on 11775 kHz at 1515 UTC. (Fraser, MA)

1320 UTC on 15155
PHILIPPINES: Voice of America Relay. "Critics Choice" featuring a radio tour of the White House. (Fraser, MA)

1344 UTC on 11810
JORDAN: Radio Jordan. Arabic. Instrumental Arabic music to DJ format. Announcer chat, and pop style music. (Wright, OH)

1400 UTC on 9600
MEXICO: Radio Universidad. Spanish. Station IDs and info at the hour. Easy-listening music to national news. Musical bridge to news on South America. Slight fades at 1410 UTC. Tentative logging on Mexico's La Voz America Latina at 1410 UTC on 15160 kHz. Morning news on Mexico, and time check to music bridge. Fair signal quality. (Schaft, OH)

1700 UTC on 4904.5
CHAD: Radiodiffusion Nationale. French/Arabic. African music and news in Arabic. French service at 1900 UTC. (Marshall, Greece) French also heard on 4904.5 kHz at 0530-0544 UTC. (Gasque, SC)

1727 UTC on 4765
CONGO: RTV Congolaise. French. Native African music tunes. Station identification, and national newscast in French. (Marshall, Greece)

1801 UTC on 6280.2
LEBANON: King of Hope. Station identification into "Lighthouse" evangelical program. (Marshall, Greece)

1839 UTC on 15030
COSTA RICA: Radio for Peace Int'l. Interesting discussion on Cuba's continuing struggles, and an increase in their black market. (Frank Hillton, Charleston, SC) Monitored on 7375 kHz at 0400 UTC. (Anderson, CA) (Tucker, GA) Costa Rica's Radio Reloj heard on 6005.5 at 1304 UTC. (Wright, MS)

1900 UTC on 15225.4
QATAR: Qatar Broadcasting Service. Arabic. Station ID at the hour and Arabic music. Programming audible to 0345 UTC sign-off. Holy Koran recitations, continuing Arabic music, newscast, and announcer talk. (Stephen Price, Conemaugh, PA)

1912 UTC on 15204.5
ALGERIA: RTV Algerienne. Arabic. World newscast, and text features. Announcer talk and Arabic music. Fair signal monitored to 1930 UTC. Arabic programming heard on 9535 kHz at 2053 UTC. Station ID into world news at 2100 UTC. (ED)

1936 UTC on 15345
MOROCCO: RTV Marocaine. Arabic. Very good signal for recitations, prayers, and Arabic music to 2000 UTC. Station ID at the hour into world news. National news to 2019 UTC. Parallel frequency 15330.6 considerably weaker. Programming monitored to 2025 UTC. Subsequent monitoring the next day on this frequency at 1535 UTC, with Arabic talk and music, possible station ID at 1600 UTC. (ED)

2012 UTC on 15185
INDIA: All India Radio. French. Indian music to sign-off ID at 2029 UTC. Unidentified language heard on 15020 kHz at 1405 UTC. (Tucker, GA) Pop music and IDs at 2015 UTC on 11620 kHz. (Fraser, MA)

2100 UTC on 15350
LUXEMBOURG: Radio Luxembourg. Pop music, station promotionals, commercials, and DJ chatter. (Tucker, GA) "Music Jam" show at 0200-0400 UTC on 15350 kHz. (Robinson, TN) (Bowman, VA) (Wright, MS) (Hillton, SC)

2108 UTC on 15495
BOTSWANA: Voice of America Relay. International news. "World Report" program with news topics and interviews. Station identifications at regular intervals. Additional African service from VOA heard on 15410 kHz at 2042. (Hillton, SC)

2222 UTC 7125
GUINEA: RTV Guineenne. French. Clear station identification, and frequency quotes. Native indigenous music and features. National anthem and sign-off at 2300 UTC. (Price, PA) Station monitored on this frequency at 0630-0700 UTC. French programming with ID heard as "vous ecoutez la Guineenne emattant de Conarky." Time checks included twice and world news topics. Here's hoping they'll QSL! (Wright, MS)

2225 UTC on 9900
EGYPT: Radio Cairo. Cultural report on Cairo. Easy-listening instrumentals with minimal interference. Announcer ID and chat to Arabic music, heard to 2245 UTC. Additional monitoring on 9475 kHz at 0206-0330 sign-off. (Miller, WA)

2240 UTC on 4860
RUSSIA: Radio Moscow. Service via Kharkov. Radio Moscow advertisements program and talk on their transcription service to station ID. (Price, PA) Additional Radio Moscow programming heard on; 17670 kHz at 1330 UTC/ 9685 kHz at 2010 UTC/ 12070 kHz at 2130 UTC. (Fraser, MA) (Wright, MS)

2310 UTC on 11930
NORWAY: Radio Norway Int'l. News coverage on oil field developments in Namibia. (Fraser, MA) (Miller, WA)

2330 UTC on 15425
SRI LANKA: SLBC. External Service monitored from 2330-2359 UTC. Near perfect copy audible with minor interferences. Programming included Tamil and Sinhala music, national news, and music to sign-off. (Robert E. Thomas, Bridgeport, CT) (George R. Kosch, Marblehead, OH) (Rose Carmine, Sidney, OH) (Wright, MS)

2357 UTC on 11970
CUBA: Radio Havana. News on Cuban politburo, followed by news, and "Spotlight on the Americas." (Tucker, GA) Audible on this frequency 0000-0500 UTC. (Thomas, CT) Bio-tech report heard on 9620 kHz at 2218 UTC. Cuban vocals, interval signal, ID, and report on Cuba's health care field. (Carmine, OH)

Utility World

6881 5872 3232 8072 9335 7113

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

Numbered Encounters

It is a seven day a week, 24 hour a day operation. Year in, year out, they have been heard all over the shortwave spectrum.

The operation appears to be well planned and well financed. There appears to be a dedicated purpose to these transmissions; no one has ever gone public about them. This would seem to indicate an iron-clad security net surrounding the stations that conduct these broadcasts.

Federal and international radio regulating bodies have no information on these mysterious stations. No call signs, frequencies, or station identification data is officially known. In other words, on paper these stations do not exist. A secret operation, definitely. Is this a Government run operation? Yes, at least in some cases.

I am talking about number stations that we all encounter throughout the shortwave spectrum. No stations in the shortwave spectrum have had more written about them than the number stations. They continue to be an interesting fact of life in the shortwave spectrum.

For the newcomer, number stations can be found outside the international shortwave broadcast bands transmitting in AM an endless stream of numbers in a variety of languages. Spanish, English and German language number stations appear to be the most common. Listeners have also reported numbers broadcast in different Slavic languages, Italian, Korean, Russian, Chinese, Yiddish, and some unknown languages. Nor is AM the only mode used to broadcast these cryptic number messages—CW or Morse code has its share of the numbers stations as well.

After the fall of the eastern bloc, many predicted the demise of the German language number broadcasts. Guess what, sports fans. These stations continue just as strong as ever. I still get my daily dose of German numbers here in the States and several overseas monitors report the broadcasts as well.

In these pages over the years, various writers have provided pieces to this fascinating puzzle. The 4-digit numbers showed up in Remington/Warrenton, VA. Running from the same site are the KKN50 CW QRA markers. Four digit number broadcasts have shown up in Florida. Yet the U.S. Government has been of little help in solving the number station mystery. A secretive bunch, aren't they?

Many government agencies have been queried over the years. Some pretend ignorance when they should at least know that these number stations exist. Others state that these stations are not within their jurisdiction. Still, others just pass the buck on to another agency with no further comment.

Within the same agency different folks have given different answers to basically the same question regarding the five digit number stations even though five digit numbers have been traced to Cuba (Havana specifically).From that I draw the conclusion that there is probably an agency-wide directive in some classified vault not to disclose valid information on any number-type station operation.

We even had the confessions of a spy right here in the pages of *Monitoring Times* admitting that he used spy number broadcasts in the field. Disinformation?

Yet given all this, "are we any closer to understanding the number stations?" Before the fall of the Eastern Bloc countries, I thought so. Now I wonder.

Several years ago information was released that at least some of the German numbers were originating from Nauen, East Germany. Given the current state of affairs, I believe that little tidbit of information is partially true. Some of the broadcasts probably originated there. Others, I am not so sure about. Propagation versus signal intercept would indicate other locations for some broadcasts.

Wouldn't it be interesting to learn that the former West German government was running some of these stations all these years? But, who are they talking to now that East Germany is no more? Maybe in reality it is the U.S. government that is running some of these stations from German soil or other locations. Interesting thought, to say the least.

I realize number stations are probably all part of the diplomatic/intelligence game. For this I respect the confidentiality of these stations communications. Even if I could ever break a code (fat chance with the current state of my knowledge) I wouldn't release that information. I just wouldn't want a couple of guys in blue suits driving me off in a white GSA car.

For years I have felt that more than one intelligence agency has used numbers to get the word out. It is the old fight fire with fire syndrome. If it works for the Israeli Mossad and the CIA then why shouldn't it work for the Germans and Cubans. It really is a great way to keep your folks informed without drawing attention to yourself. Shortwave radios are very common outside the US. These broadcasts are all high power and AM, so a simple readily-available radio is all that is needed to complete the communication circuit.

If other countries have borrowed our idea and applied it to their agency, do you think they are going to leak that the US government has number stations? Sorta makes their number stations useless at that point. In this way the game can go on, secure in the knowledge that the people affected by the operations will never learn the details of the operations. That is the way it is supposed to work on paper.

Do we have a genuine mystery? Yep, I would say so. And even if we solved the mystery today, there will always be someone out there saying "that has to be government disinformation." Maybe they just want the mystery to continue for whatever reason or it doesn't fit their beliefs. So let's gear up for another 30 years of numbers and remember that opinions are like elbows; 'most everyone has at least two.

To the number station monitoring community: I don't mind printing number logs here in the Utility World column, but I will ask you to please include the day of the week and time in UTC in your logging. Also, be sure to include the type of number station you are hearing (i.e.- Spanish female 4 or 5 digit, English female 4 digit, etc).

Speaking of Numbers

Regular reporters Tom Mazanec in Maple Heights, Ohio; Russ Hill in Michigan; and Bill Fernandez in Massachusetts have sent in nice lists of number stations they have recently monitored. Some of the stations listed below, according to Tom Mazanec, have been regularly heard at his location over the last year or so. Frequency kHz, (time UTC).

Spanish Female 5-digit Number Stations
5417 (0300) 6798 (0500) 6828 (0218) 6855 (0240) 7846 (0700) 7888 (0600/0800) 5762 (0617) 8088 (0700) 8188 (0800) 9251 (2230)
Spanish Female 4-digit Number Stations
10600 (2225) 6802 (0000) 6804 (0200) 6934 (0400) 10601 (2200/2300) 7425 (0300/0400) 6840 (0230-0240)
CW Five Letter Groups station
8091 (0400)
English female numbers (Lincolnshire Poacher jingle)
7887 (0600)
German female numbers (Swedish Rhapsody jingle)
6507 (0500)

German female 3/2-digit Number Stations
10744 (2220)
English female 3/2-digit Number Stations
9091 (2100) 6935 (0000) 4642 (0000) 11190 (2100)
English male 5 digit X2 Number Station
22222 (1600/Sat UTC) repeated 18882 one hour later. The same noted again on Sunday. 10480 (2025)

Water Dripper is a chirpsounder...N-O-T!

Okay, folks, I take back what I said in May. After checking with the main companies that manufacture chirpsounders for the military, the Water Dripper is definitely not a chirpsounder.

Several of the companies actually let me hear what a chirpsounder sounds like over the air via telephone and none of them sound like our lovely little water dripper. The mystery continues.

And no, I won't try another guess until I have a chance to access some more of my contacts. Oh well, sounded good at the time. So much for trying to use some basic research methods.

"KYA" Aircraft ID'ed

In the April column on page 35 on 11300 I ran a log from Dan Fellows on a KYA102 (707 aircraft) from London to Nairobi working Khartoum. Dan asked what airline is associated with the KYA call. Ken Holliday over England way says that KYA is Yana Air Cargo in Kenya. Thanks for clearing that up, Ken.

Southbound II

Several of my readers like Bernard H. Shunk (WI8O) have asked about the Southbound II on 12353.0 kHz. Well, Bernard, no big mystery here. The motor vessel Southbound II, callsign VA4219, is operatored by Herb. Herb sends out weather information to marine interest and ships in the Eastern Caribbean for the Caribbean and Atlantic waters everyday from 2300 to 0000 UTC.

Herb does this as a hobby from his location in the Bahamas and really enjoys providing the service. The Southbound II should be an interesting source of information as the hurricane season gets in full swing next month. Keep your eye on 12353.0.

South African DX Club News

Robert Hall in Capetown reports excellent reception throughout the day of the FAX broadcast from the US Navy station at Diego Garcia on 20300.2 and 20910.0 kHz. The station uses 120 rpm and an IOC of 576 (pretty much a US Navy standard). This station transmits charts using the schedule listed for Apra Harbor in the current edition of the Klingenfuss *Guide to Utility Stations*.

Robert also notes that the 20300.2 frequency is used to transmit RTTY at 850 shift/75 baud. The charts Robert sees from this station cover the Middle East and Indian Ocean areas with some satellite imagery.

The Russians have a station in the Antarctic—SAAM Molodezhnaya. They have been noted transmitting two charts every day at 1200 and 1225 UTC on 18488.4. Both of these charts give the monitor a bird's eye view of weather over the Antarctic. Robert notes nothing else has been heard on any listed SAAM Molodezhnaya frequency at any other times.

Robert has also noted recently a lot of activity on Swedish embassy frequencies. These stations use the SWED-ARQ mode of operation and he has logged many transmissions between SAM and SIDA Stockholm (Ministry of Foreign Affairs) and various Swedish embassies in Africa including Kinshasa, Nairobi, Dar-es-Salaam, Harare, Addis Ababa and so on.

Swedish language 'en clair' is often used but there is also plenty of crypto and 5 letter groups. Each embassy seems to have its own assigned frequency which is used for signals in both directions. Signals from Stockholm are addressed to embassies by name and usually signed "Cabinet - UD Stockholm." Signals to Stockholm are addressed to SAM or SIDA, followed by a named person. No call signs have been seen thus far.

The most active frequencies are 20607, 20699.9, 20987.1, 23078.9, 23593 and 23547.7. Speeds are all at 100 baud and the shifts are at 370/425 (not the 170 preset in the M7000). These Swedish embassy frequencies are most active between 1000 and 1600 UTC with nothing being heard outside these times. One note of interest: the SWED-ARQ mode appears to be called UDTEX by the Swedes themselves.

Robert got a recent phone call from the folks at Capetown Marine Radio. Seems they had 16420 kHz assigned to them during last year's marine band realignment but something was there causing bad QRM. They asked Robert to help and he said "it would be a pleasure."

He dashed into the shack and fired up his ICOM receivers and the M7000 and gained immediate reception of a familiar slow speed data mode, ARQ-E3. "All the LED's lit up like a Christmas tree on 16421.5 with the RTTY button pressed on the ICOM which equates to 16420 kHz USB. The station was sending ARQ-E3 with a speed of 48 baud and a shift of 413 Hz. French 'en clair' followed by crypto came up on the screen and then some very strong signals from call signs RFFBDHI to RFTJF (from the War Office, Paris to the French military station at Port Bouet, Ivory Coast)."

Robert has since monitored more traffic between Paris and French Force stations in Africa and regular "Controle de Voie" at H+28 from RFTJ Dakar, Senegal. Re-tuning to 16420 kHz USB brings in all sorts of traffic from ships calling Roma Radio and Monaco Radio, and other stations. But the 'FROG' War Office has got them all beat for signal strength!

Finally, Robert passes on the following frequencies for Capetown Radio (ZSC) effective July 1, 1991.

Radio Telex Frequencies - SITOR-A mode SELCAL 4331.

Channel No.	Callsign	ZSC	Ship	Hours of Service
	ZSC60	2850	2502	1600-0600 UTC
4008	ZSC61	4214	4176	24 hours
8025	ZSC62	8428.5	8388.5	24 hours
12044	ZSC63	12601	12498.5	24 hours
16019	ZSC64	16816	16692.5	0600-1800 UTC
22064	ZSC65	22408	22316	0600-1800 UTC

Navigation warnings: 0615 0900 1700 UTC
Weather forecasts: 0930 1730 UTC
Traffic List SITOR-B: Even hours + 15 minutes

Radio telephone Frequencies - USB mode
International Call & Answer (24 hours) Working Frequencies

Chan Nos.	ZSC	Ship	Chan Nos	ZSC	Ship
DSC 2	4125	4125			
421	4417	4125	405	4369	4077
821	8779	8255	805	8731	8207
1221	13137	12290	1209	13101	12254
1621	17302	16420	1608	17263	16381
2221	22756	22060	2204	22705	22009

Wireless Telegraphy Service - CW mode
ZSC20 changed to 22659 kHz - other frequencies remain unchanged.

I would like to thank Robert Hall for this information and look forward to future information along this line from him and you as well. Schedules, station information and pictures, reception techniques, FAX charts and imagery are always welcome here at the Utility World. Now it's time to see what you have been hearing this month and time for me to get a hurricane. Later all...

Utility World

Utility Loggings

Abbreviations used in this column

Aero	Aeronautical	PTT	Point to Point
CANFORCE	Canadian Forces	QRA	The name of my station is
ch	channel	QRM	Interference
COMCEN	Communications Center	QSX	I am listening to...callsign/ frequency
CQ	General call for any station	RAF	Royal Air Force
CW	Morse code mode of operation	RTTY	Radioteletype
DE	Morse code abbreviation meaning 'from'	SITOR-A	Simplex teleprinting mode, mode A
HF	High Frequency	TANJUG	Telegrafska Agencija Nova Jugoslavija (Yugoslav Press)
ID	Identification	Unid	Unidentified
METAR	Aviation Weather Report	USB	Upper Side Band (voice mode)
Meteo	Meteorology	USCG	United States Coast Guard
MFA	Ministry of Foreign Affairs	Xinhua	New Chinese News Agency
MTI	Magyan Tavisata Iroda (Hungarian Press)		

All frequencies in kilohertz (kHz), all times in UTC. All voice transmissions in English unless otherwise noted.

2598.0 VON-St. John's, Newfoundland, Canadian Coast Guard with marine weather and ice report in USB at 0130. VCP-St. Lawrence, Quebec also heard at 0045 in USB. (Jack Galvin-Arlington, MD)

2754.1 CKN-CANFORCE, Vancouver, BC, Canada, with V CW marker at 1010 with fair levels. (Mike Hardester-Jacksonville, NC)

3186.0 KWS78-Department of State Radio, Athens, Greece, with a QRA CW marker at 2348. (Jack Dix-Yonkers, NY)

3517.0 GNI1-Niton Radio, Isle of Wight, England, with SITOR-A idler signal at 2332. (Dix-NY)

3659.0 P8K-Unid station with coded messages and V CW marker at 2020 parallel to 3159.0 (Ary Boender-Netherlands)

4010.0 DFD21-German 3/2-digit number station heard in AM at 2240. (Dix-NY)

4043.0 'P'-Single letter HF CW beacon heard at 2251. (Dix-NY)

4215.0 VIS60-Sydney Radio, Australia, with CW ID and SITOR-A idler at 1303. (Gordon Trigg-Christchurch, NZ

4215.5 VIP41-Perth Radio, Australia, with CW ID and SITOR-A idler at 1259.(Trigg-NZ)

4216.5 VIS61-Sydney Radio, Australia, with CW ID and SITOR-A idler at 1305. (Trigg-NZ)

4245.0 VIS53-Sydney Radio, Australia, with a V CW marker at 1044. (Dix-NY)

4271.0 FUJ-Noumea French Naval Radio, New Caledonia, with V CW marker at 1047. (Dix-NY)

4305.0 'A'-Single letter HF CW beacon heard at 0043. (Dix-NY)

4305.5 JNA-Tokyo Radio, Jaan, with a CW CQ marker at 0925. (Dix-NY)

4360.0 CIO-Israeli Mossad number station heard in AM at 0046. (Dix-NY)

4417.0 Chatham Island, New Zealand, with marine weather at USB at 0937. (Trigg-NZ)

4426.0 NMN-USCG Portsmouth, VA, with marine weather at 1002 in USB. NMC-USCG San Francisco, CA, with marine weather at 1031 and 1630 in USB. (Trigg-NZ)

4497.0 SOE349-Warsaw Meteo, Poland, with RTTY weather broadcast at 2145. (Boender-Netherlands)

4560.0 YHF-Israeli Mossad number station heard in AM at 2302. (Dix-NY)

4602.1 IDR-Rome Naval Radio, Italy, heard at 2330 with a V CW marker. (Dix-NY)

5305.8 'P'-Single letter HF CW beacon heard at 2354. (Dix-NY)

5306.0 'C'-Single letter HF CW beacon heard at 2236 and 2338. (Dix-NY)

5340.0 German female 5-digit number station in AM at 2310. (Havenburg-MD)

5690.0 DHM95-Lahr Military (CANFORCE), Germany, with weather at 2320 in USB. (Dix-NY)

5732.0 German female 5-digit number station in AM at 2317. (Havenburg-MD)

5760.0 OVG-Fredrikshavn Naval Radio, Denmark, with V CW marker at 2344. (Dix-NY)

6386.5 ZSJ-COMCEN Cape (Silvermine), South Africa, with a CQ CW marker at 0314. (Gordon Levine-Anaheim, CA)

6470.0 SXA24-Spata Attikis Naval Radio, Greece, with a V CW marker at 0255. (Hardester-NC)

6501.0 NRV-USCG Guam, with marine weather in USB at 0930. NMN-USCG Portsmouth, VA, with marine weather broadcast in USB at 1001. (Trigg-NZ)

6507.0 VIM-Melbourne Radio, Australia, standing by for ship traffic in USB at 0956. (Trigg-NZ)

6513.0 VCS-Halifax, Nova Scotia, Canadian Coast Guard with marine weather in USB at 0200. (Galvin-MD) Heard same at same time with good levels. (Hardester-NC)

6697.0 MKL-RAF Pitreavie, Scotland, calling Z7L in CW at 2026. (Dix-NY)

6753.0 VXA-CANFORCE Edmonton, AB, Canada, with weather at 1120 in USB. (Trigg-NZ)

7038.8 'S'-Single letter HF CW beacon heard at 1150. (Dix-NY)

7522.0 CW 5-digit number station heard at 0800. (Tom Mazanec-Maple Hts, OH)

7668.5 HBD54-Swiss Embassy, Rome, Italy, with SITOR-A 5 letter code groups at 0832. (Mark Burkart-New Orleans, LA)

7846.0 Spanish female 5-digit number station in AM at 0613. (Mazanec-OH)

7865.0 Spanish female 5-digit number station in AM at 0507. (Mazanec-OH)

8273.0 KXC713-Wood's Hole, MA, working WXAQ-R.V. Oceanus in USB at 1430. (Galvin-MD)

8441.4 9HD-Malta Radio, Malta, with a V CW marker at 0845. (Dix-NY)

8445.0 PKN-Balikpapan Radio, Indonesia, sending a CW CQ marker at 1114. (Dix-NY)

8446.0 UQK-Riga Radio, Russia, with a DE CW beacon at 2102. (Dix-NY)

8450.0 SAA-Karlskrona Radio, Sweden. Heard calling SKFQ here in CW at 0914. (Dix-NY) *Interesting Jack, I only show them listed around 2789.0. Must have moved up to 8 MHz for a new service-Larry.*

8469.0 D4A-Sao Vicente Radio, Cape Verde Islands, with CW CQ marker and traffic list at 1942. (Dix-NY)

8470.0 XVG9-Haiphong Radio, Vietnam, with a CQ CW marker heard at 1130. (Dix-NY)

8473.0 PKE-Amboina Radio, Indonesia, with a CQ CW marker at 0925. (Dix-NY)

8483.5 DAN-Norddeich Radio, Germany, with CQ CW marker at 0543. (Stanley Klemanowicz-Torrance, CA)

8485.0 4XO-Haifa Radio, Israel, with CQ CW marker at 0148. (Klemanowicz-CA)

8490.0 AQP-Karachi Naval Radio, Pakistan, with a V CW marker at 2134. QRM from PPR. (Dix-NY)

8494.8 'S'-Single letter HF CW beacon heard at 0957 and 1101. QRM from SAG. (Dix-NY)

8495.0 'C'-Single letter HF CW beacon heard at 1101. QRM from SAG. Also caught the 'F' beacon at 0958. (Dix-NY)

8516.0 GKC4-Portishead Radio, England, with DE CW marker at 0621. (Klemanowicz-CA)

8520.1 PPO-Olinda Radio, Brazil, with V CW marker at 0629. (Klemanowicz-CA)

8541.0 URB2-Klaipeda Radio, Lithuania, with a CW CQ marker at 1001. (Dix-NY)

8545.9 GKA4-Portishead Radio, England, with DE CW marker at 0059. (Klemanowicz-CA)

8548.0 DZF-Manila (Bacoor) Radio, Philippines, with a CQ CW marker at 1137. QRM from JFA. (Dix-NY)

8551.6 CTP95-Oeiras, Naval Radio, Portugal, with DE CW marker at 0611. (Klemanowicz-CA)

8566.0 ZSJ4-COMCEN Cape (Silvermine), South Africa, with CQ CW marker at 0035. (Klemanowicz-CA)

8568.5 XFM-Manzanillo Radio, Mexico, with CQ CW marker at 0038. (Klemanowicz-CA)

8571.0 JNA-Tokyo Radio, Japan, with CQ CW marker at 0534. (Klemanowicz-CA)

8598.4 ZLO4-Irirangi Naval Radio, New Zealand, with CQ CW marker at 0511. (Klemanowicz-CA)

8602.0 CWA-Cerrito/Ounta Carretas Radio, Uruguay, with CQ CW marker at 0055. (Klemanowicz-CA)

8604.5 ZRH-Cape (Fisantekraal) Naval Radio, South Africa, with V CW Marker at 0454. (Klemanowicz-CA)

8632.0 XSW-Kaoshiung Radio, Taiwan, with CQ CW marker at 1623. (Klemanowicz-CA)

8643.0 UKA-Vladivostok Radio, Russia, with a CW CQ marker at 1100. (Dix-NY)

8666.0 FUG-French Naval Radio, La Regine, transmitting CW mesages at 2110. (Boender-Netherlands)

8686.0 HSA2-Bangkok Radio, Thailand, with a CQ CW marker at 1130. (Dix-NY)

8690.0 3DP3-Suna Radio, Fiji, with a CQ CW marker at 0941. (Dix-NY) 6VA3-Dakar Radio, Senegal sending a CQ CW marker at 2118. (Marcelo Toniolo Dos Anjos-Osasco, Brazil)

8700.0 YUR3-Rijeka Radio, Yugoslavia, with V CW marker at 0312. (Klemanowicz-CA)

8700.4 HKB-Barranquilla Radio, Colombia, with CQ CW marker at 0440. (Klemanowicz-CA)

8728.0 3AC8-Monaco Radio, Monaco, with weather broadcast for the Mediterranean in English and French at 1718 using USB. (Allen D. Marshall-Crete, Greece) *Welcome to Ute World Allen, nice to have a reporter from your neck of the woods-Larry.*

8739.0 5BA42-Cyprus Radio, Cyprus, announcing maritime frequencies in English and Greek at 1812 in USB. Here are the announced frequencies: ch 807 - 8737/8213; ch 1208 13098/12251; ch 1603 17248/16366; ch 2212 22729/22033. (Marshall, Greece)

WOO-Ocean Gate Radio, NJ, with a traffic list in USB at 0158. (Levine-CA)
OSU41-Ostend Radio, Belgium, working with vessel "Papa Bravo Yankee Alpha" at 1511 in USB. (Marshall-Greece)
NMN-USCG Portsmouth, VA, with marine weather at 1000 and 2200 in USB. NMC-USCG San Francisco, CA, with marine weather at 1030 and 1630 in USB. (Trigg, NZ)
DFZG-NFA Belgrade, Yugoslavia, with RTTY 75 baud TANJUG news plus other items at 0630. (Burkart-LA)
HEB18-Berne Radio, Switzerland, passing traffic to several vessels in English at 1723 in USB. (Marshall-Greece)

0 RMP-Russian Naval Radio, Kalinigrad, calling UHEL sending coded CW messages at 1924. (Boender-Netherlands)

.0 Walking man sounds at 0715. This has been a 7 day a week 3/2-digit English number station noted around 2100, but no messages have been heard at the 0715 broadcast. (Mazanec-OH)

0.0 RTQ78-Sverdlovsk Meteo, Russia, sending RTTY weather at 1840. (Boender-Netherlands)

37.0 MKD-RAF Akrotiri, Cyprus, with RTTY RY test tape at 1855. (Boender-Neth)

17.0 BZP59-Xinhua Urumqi, China, with English news bulletins at 1845. (Boender-Netherlands)

967.5 'LYNX' unid station idling with a CW marker sending callsign. (Dix-NY)

0004.0 RID-Time Station Irkutsk, Russia, with time signals at 1119. (Dix-NY)

10285.2 'S'-Single letter HF CW beacon heard at 1005. (Dix-NY)

11139.0 DFZG-MFA Belgrade, Yugoslavia, with RTTY 75 baud diplomatic and TANJUG news items in the clear at 0745. (Burkart-LA)

11218.0 ZSJ-Cape (Silvermine) Naval Radio, South Africa, with a CQ CW marker at 2024. (Dix-NY)

11267.0 Numerous letter-number-letter units (tactical calls) from the Navy in comms in USB around 0220. (Neal Smith-Manchester, MO)

11300.0 Seychelles Radio, Port Victoria, working Air France 465 in USB at 0318. (Marcelo Toniolo Dos Anjos-Brazil)

11359.0 RFNV-Moscow Air, Russia, with CW METAR messages at 2013. (Boender-Neth)

12282.0 3BY-Unknown station sending V CW marker at 1149. (Dix-NY) *Great, just what we need another mystery. Anybody give us a hand on this one? My guess is a new naval down in Mauritius based on time and traffic-Larry.*

12311.0 RCF-Moscow, Russia, with RTTY RY/CQ marker at 0903. (Boender-Netherlands)

12353.0 Southbound II moored in Bermuda, dispensing weather information to various small boats in the Atlantic and Caribbean area in USB at 2300 to 0000. He is on 7 days a week. (Galvin-MD) Heard during the same time in USB. Callsign is VA4219. (Doug Merkel-St. Louis, MO)

12704.5 PKD-Surabaya Radio, Indonesia, with a CQ CW marker at 0027. (Dix-NY)

12811.3 HZY-Ras Tannurah Radio, Saudi Arabia, with CW CQ marker and mentioned traffic list would be sent next even hour on 12811.3 and 16960.0 at 1159. (Dix-NY)

12840.0 VTP6-Vishakhapatnam Naval Radio, India, with V CW marker heard at 1200. (Dix-NY)

12870.0 DZO-Manila (Bulacan) Radio, Philippines, with CQ CW marker at 1211. (Dix-NY)

12958.0 Kilo 44 calling Kilo 15 (No Reply). Then Kilo 01 imforms Kilo 44 that someone will drive over to 15 to check status. Kilo 04 also heard all in USB, possible New York National Guard. (Dix-NY)

12970.5 PKX-Jakarta Radio, Indonesia, with CQ CW marker at 1250. (Dix-NY)

12975.0 IQX-Trieste Radio, Italy, with V CW marker at 0033. (Hardester-NC)

12980.0 PKX2-Jakarta Radio, Indonesia, with CQ CW marker at 1221. (Dix-NY)

13011.0 AQP6-Karachi Naval Radio, Pakistan, with V CW marker heard at 2137. (Hardester-NC)

13024.5 ASK-Karachi Radio, Pakistan, with a CQ CW marker at 1232. (Dix-NY)

13042.5 PJC-Curacao Radio, Netherland Antilles, with CQ CW marker at 1255. (Dix-NY)
XVS9-Ho Chi Minh City Radio, Vietnam, sending a traffic list and CW marker at 0021. (Marcelo Toniolo Dos Anjos-Brazil)

13065.0 6YI-Kingston Radio, Jamaica, heard with a CQ CW marker at 1239. (Dix-NY)

13065.5 50W13-Lagos Radio, Nigeria, with a V CW marker at 1907. (Marcelo Toniolo Dos Anjos-Brazil)

13076.7 HZG-Damman Radio, Saudi Arabia, sending a CW marker and message at 0348. (Marcelo Toniolo Dos Anjos-Brazil)

13083.0 KMI-Dixon Radio, San Francisco, CA, working the Sun Viking in USB at 1805. (Levine-CA)

13089.0 NMN-USCG Portsmouth, VA, with marine weather in USB at 2200. NMC-USCG San Francisco, CA, with marine weather at 1030, 1630, 2230 in USB. NRV-USCG Guam, with marine weather at 2130 in USB. (Trigg-NZ)

13098.0 WOM-Pennsuco Radio, FL, working the Betty Jo in USB at 0112. (Levine-CA) 5BA54-Cyprus Radio, Cyprus, with ID in English and Greek at 1437 in USB. (Marshall-Greece)

13101.0 WOM-Pennsuco Radio, FL, working various ships in USB at 0106. (Levine-CA)

13146.0 3AC12-Monaco Radio, Monaco, with ID in English and French then traffic at 1439 in USB. (Marshall-Greece)

13161.0 KMI-Dixon Radio, CA, working the Fair Princess in USB at 1725. (Levine-CA)

13282.0 ZKAK-Auckland Volmet, New Zealand, with aero weather and ID then out at 1823 in USB. (Marshall-Greece)

13420.0 CUA/CUL-Lisbon Radio, Portugal, here with a V CW marker at 1814. (Dix-NY)

13455.0 Spanish female 4-digit number station in AM at 0136. (Smith-MO)

13520.0 FSB72-Interpol Paris, France, with SITOR-A coded messages at 1800. (Boender-Netherlands)

13530.0 RVW53-Moscow Meteo, Russia, with RTTY weather broadcast at 1330. (Boender-Netherlands)

13635.7 'D'-Single letter HF CW beacon heard at 1753. (Dix-NY)

13635.9 'S'-Single letter HF CW beacon heard at 2046. Also 'K' beacon heard at 2332. (Dix-NY)

13636.0 'C'-Single letter HF CW beacon heard at 1139. (Dix-NY)

13636.1 'F'-Single letter HF CW beacon heard at 2331. (Dix-NY)

14487.0 English female 5-digit number station with Lincolnshire Poacher tones at 1738 in AM. (Dix-NY)

15670.0 HGM36-MTI news agency Budapest, Hungary, with RTTY news at 1620. (Boender-Netherlands)

16015.0 OLG-PTT Prague, Czechoslovakia, with RTTY RY test tape at 1318. (Boender-Netherlands)

16295.2 DFZG-MFA Belgrade, Yugoslavia, with diplomatic RTTY traffic using 50 baud at 0701. (Burkart-LA)

16300.0 OMZ-MFA Prague, Czechoslovakia, with RTTY 100 baud RY test tape plus traffic at 0920. (Burkart-LA)

16345.0 CLP8-Cuban Embassy, Guinea, with RTTY 50 baud traffic in the clear at 1937. (Burkart-LA)

16591.5 6WW-French Naval Radio Dakar, Senegal, with V CW marker at 2045. (Boender-Netherlands)

16597.8 HBD20-MFA Berne, Switzerland, with SITOR-A 5 letter groups at 1556. (Burkart-LA)

16949.0 UPW2-Liepaja Radio, Latvia, with a CW CQ marker at 1301. (Dix-NY)

16980.0 UNQ-Novorossiysk Radio, Russia, calling 4LA7 then traffic list in CW at 1812. (Dix-NY)

16982.5 KOAT calling HKMR in CW with a traffic list at 0120 for NIL and QSX G1 ES G5. Also heard at 2333 with traffic list for MVMI MVMT and same QSX as 0120. (Dix-MY) *Now I am really starting to get interested in these stations. Anybody have any ideas? My guess is Pacific/Asia/Down under areas-Larry.*

17015.6 'D'-Single letter HF CW beacon heard at 1230. (Dix-NY)

17015.7 'S'-Single letter HF CW beacon heard at 1749 and 1230. (Dix-NY)

17015.8 'D'-Single letter HF CW beacon heard at 0921. (Dix-NY)

17016.0 'C'-Single letter HF CW beacon heard at 1230. (Dix-NY)

17018.0 EBA-Spanish Naval Radio, Madrid, with naval area warnings in CW at 1803, RTTY at 1815. (Boender-Netherlands)

17061.1 'F'-Single letter HF CW beacon heard at 1738. (Dix-NY)

18363.5 9PL-Kinshasa Air, Zaire, with RTTY RY test tape at 2000. (Boender-Neth)

18462.0 PCW1-The Hague, Netherlands, with coded embassy traffic using SITOR-A and CW ID at 1530. (Boender-Netherlands)

19210.0 RCC79-Moscow, Russia, with news broadcast using RTTY at 1334. (Boender-Neth)

19516.7 IPG20-MFA Rome, Italy, with SITOR-A plain text traffic at 2310. (Burkart-LA)

19731.8 PCW1-The Hague, Netherlands, with coded SITOR-A messages to Tel Aviv at 1535. (Boender-Netherlands) With 5 letter groups at 1810. (Burkart-LA)

20628.0 CLP9-Cuban Embassy, Yemen, with RTTY 50 baud 5 letter groups and clear Spanish language traffic at 1445. (Burkart-LA)

20834.5 CLP7-Cuban Embassy, Congo, with RTTY 50 baud plain text diplomatic traffic at 2050, 5 letter code groups at 2133 and CW at 2208. (Burkart-LA)

20991.7 'D'-Single letter HF CW beacon heard at 1144. (Dix-NY)

20991.8 'P'-Single letter HF CW beacon heard at 1144. (Dix-NY)

22859.7 7L1-Czech Embassy in Havana, Cuba, with RTTY 100 baud diplomatic traffic at 1510. (Burkhart-LA)

23355.5 CLP18-Cuban Embassy, Tanzania, with RTTY 50 baud diplomatic traffic in the clear at 1810. (Burkart-LA)

23561.0 PCW1-The Hague, Netherlands, with coded SITOR-A message traffic at 1520. (Boender-Netherlands)

24037.7 CLP45-Cuban Embassy, Angola, relaying RTTY 75 baud messages from CLP18 to CLP1 in Cuba at 1839. (Burkart-LA)

25227.0 HBD20-MFA Berne, Switzerland, with SITOR-A 5 letter groups at 1630. (Burkart-LA)

The Scanning Report

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

Shack Survival

During the summer thunderstorm season, voltage spikes are a real threat to sensitive electronic equipment. In less than a millisecond, everything from computers to digital clock radios can be damaged by a sudden rise in your house current. An increase in house current that lasts only a few milliseconds is called a "spike." If the increase lasts for one tenth of a second or more, it's called a "surge."

While the terminology may differ, the results from a surge or spike are the same—your equipment is fried. Most people think that a voltage spike will cause sparks and smoke to erupt from your scanner radio or computer. In reality, that rarely happens. The micro-chips in your scanning equipment can be silently damaged without any visible effects. And your equipment doesn't have to be turned on to be damaged. If it's plugged in, a voltage spike or surge can jump across the small gap of an off-on switch and cause major damage to the unit's main components.

Another misconception is that voltage spikes and surges only occur in the summer. Although lightning strikes are of primary concern, they are not the only culprits. When a shopping mall or factory shuts down for the evening, the sudden termination of such a large draw of electricity could cause a voltage increase in your house current. Local power companies are responsible for voltage spikes that are the result of faulty line equipment. But proving that a valuable piece of equipment was damaged because of the utility company negligence is a difficult task. If several neighborhood homes were affected, the chances of collecting on your claim are substantially increased.

Lightning-induced power surges that ruin your valuables may be covered by homeowner insurance. However, protecting your equipment from voltage spikes is easy and relatively inexpensive. There are dozens of surge and spike protectors on the market and most can be purchased for under $20.00.

Although spikes and surges are separated by two distinct explanations, no such separation exists in the consumer market. A spike protector performs no differently than a surge protector. The less expensive models contain voltage sensitive components that stop the sudden surge of current. While these devices are the most reasonably priced, they have only one life and must be discarded once they are "tripped."

The less expensive models have another drawback; only the positive or "hot" wire is protected. If a short circuit should occur and voltage be introduced along the negative wire, your equipment could be damaged.

The more expensive models contain dual protection and tripping devices that resemble common circuit breakers. If a surge does occur, the breaker can be simply reset and the unit placed back into service. Regardless of the model chosen, look for the "UL" (underwriters laboratories) seal. It's an easy way of determining that the unit is well constructed and electrically safe.

A large number of surge protectors also incorporate filtering devices that will help to eliminate radio frequency interference (RFI), and electro magnetic interference (EMI). Although there may be some improvement in signal clarity, don't expect the filters to totally eliminate stray interference from nearby computers, fans, air conditioners, and other household appliances.

In addition to placing surge protectors in your listening post, consider installing one in every room that has a stereo, VCR, television or computer. The number of outlets on any surge protector can be increased with a multiple outlet strip. But be careful not to exceed the surge protector's amperage rating. If you do, it may "trip" just as if there had been a power surge.

A lightning strike that occurs within close proximity of your outside scanning antenna can also damage your equipment. The lightning can "charge" the air around your antenna and induce a fatal spike of electricity that enters the radio through the coax cable. Again, don't expect to see smoke and flames. It only takes a small amount of current to completely ruin a sensitive receiver.

To protect your equipment from antenna induced voltage spikes, manufacturers have introduced a wide variety of lightning protectors. Radio Shack sells several lightning protectors that range in price from $3.00 dollars to $30.00 dollars. Grove Enterprises sells a top of the line gas discharge lightning protector (Catalog #LA1F) for approximately $20.00.

Although gas discharge protectors are superior to other types of lightning arresters, no product on the market can guarantee total protection. During an average thunderstorm, a lightning bolt can deliver between 25,000 and 45,000 amperes of current. The normal home only requires a 200 amp service to do everything from cooking in the microwave, to washing and drying clothes. The only sure way to preserve sensitive equipment is to disconnect the antenna, and unplug the power cord.

I'll be the first to admit that I don't remember to disconnect my equipment after every monitoring session. On several occasions I've found myself miles from home and nervously watching the advance of a summer thunderstorm. When that happens to you, give your equipment the best possible chance of survival. Install lightning and surge protectors in your listening post and throughout your home. The life of your equipment may depend upon them.

Treasure Hunt

Davis Instruments has donated their top of the line weather monitor for our Treasure Hunt. The Weather Monitor II features technology from the next century. By merely pushing a touch-sensitive key pad, you can instantly see the inside/outside temperature, barometric pressure, wind direction, wind speed, humidity, time and date. Touch another button and instantly recall the high and low readings of any setting.

The Weather Monitor II features an easy-to-read digital display that measures 1-7/8" x 4-3/8". The reversible mounting base will allow you to use the unit on a desk, shelf or wall. It can also be set to automatically display all the current readings—you can get a full weather report by simply glancing at the display.

The illuminated control module is connected to a roof top anemometer, wind vane and outside temperature sensor. Installation of the anemometer is easy—simply attach it to the mast of your roof-top scanning antenna. The control cable installation can also be simplified by routing it along the same path as your antenna coax cable. Total installation time will probably take less than 30 minutes.

To win the Weather Monitor II for your listening post, here are the clues:

1. Weather fronts move across the U.S. from West to East. True or False?
2. The U.S. Weather Bureau was established in what year?
3. What is a "Weathercock?"
4. Provide a one word definition for the term "Weatherglass."
5. Altostratus is a cloud form. True or False?

In addition to the Weather Monitor II, Davis Instruments has also included their "WeatherLink"—a connection between the Weather Monitor II and the serial port on your personal computer. All hardware is provided and installation of the software only takes a few minutes.

"Weather
or II" and
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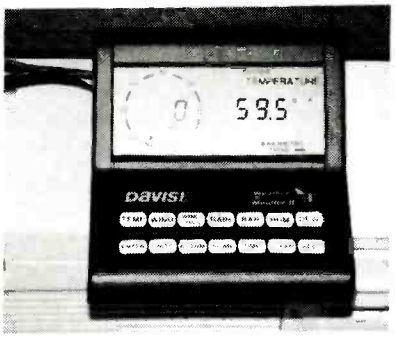
the prizes
this month's
asure Hunt.



WeatherLink is the ultimate in weather monitoring. It can create hs, calculate average weather conditions, generate summaries, ana- trends and much more. It also allows you to monitor and control ny of the functions of the Weather Monitor II via your computer een.

System requirements for the WeatherLink are 640K, MS-DOS 2.1 higher, CGA, EGA or VGA monitor. The software will support just lout any printer that's on today's market.

Weather Monitor II retails for $295.00. The WeatherLink retails for 150.00. Davis Instruments has a catalog that features a variety of /eather monitoring systems that can easily fit into your listening post nd budget. For more information contact: Davis Instruments, 3465 Diablo Ave, Hayward, CA 94545. The phone number is (510) 732-9229.

Frequency Exchange

Aloha. Welcome to ***Hawaii***. Jim Helm lives in Honolulu, and here are his favorite frequencies:

36.50	Medivac Helicopters	408.575	Arizona Memorial
36.90	" "	453.225	Aloha Stadium
154.280	Fire Department	453.425	Zoo
155.520	Police	453.700	Medicom
156.475	Pearl Harbor Control	453.925	City/Co ambulance
168.525	Punch Bowl Nat. Cemtry	458.225	Aloha Stadium

Okay, gang, it's time to visit with our next guest. What? You don't want to go? Well, I can appreciate your desire to remain in Hawaii, but we are scheduled to visit with other folks. How about a compromise? If you promise to come along and visit with our other guests, I promise to bring you back to Hawaii. Let's go! We're already late.

As we arrive in ***Bakersfield, California***, Harry Davis has invited us to monitor the following:

151.100	Roads	453.225	Sheriff & Fire (Red)
153.758	Parks	453.300	Fire (Blue)
153.950	Fire #2	453.375	Fire (Yellow)
154.070	Fire #1	453.400	Sheriff (Brown)
155.190	Police #2	453.450	Fire (Orange)
155.310	Police #1	453.600	Sheriff (White)
155.790	Police #3	453.700	Sheriff (Green)
453.050	Sheriff (Purple)		

Railroad-Southern Pacific	Railroad:Sante Fe	
160.890	160.010	161.370
160.950	160.260	
161.400	160.335	
161.550	160.650	

Tim Chavez lives in ***Southern California*** and he has provided the Wildland forest fire frequencies:

151.160	Tactical	151.310	Yellow Air
151.190	San Diego	151.325	San Bernardino East
151.220	Crew Net	151.340	So Region Admin Net
151.250	San Diego Tactical	151.355	State Net
151.265	CDF Net #2	151.385	Riverside County
151.280	Blue Air	151.445	San Bernardino West

U.S. Forest Service

166.675	Air Tactics #1	168.625	Air Dispatch
168.050	Tactical #1	168.700	Command #1
168.075	Comm. #3	169.200	Air tactics #3
168.100	Comm. #2	171.475	San Bernardino NF
168.200	Crew net	171.575	Angeles NF
168.600	Tac #3		

John Bailey is a police radio dispatcher in ***Vernal, Utah***. Here are John's favorite frequencies:

151.130	State Roads-Uintah Co	155.415	Bureau of Indian Aff.
154.085	Vernal City public works	155.640	Roosevelt City Police
154.770	Utah Highway Patrol	155.835	Duchesne Co EMS
155.055	Uintah County EMS		

Gary Webster sent in his "Top Ten" frequencies for ***Conway, New Hampshire***.

151.340	Fish & Game	155.640	Conway Police Dept.
154.445	Conway Fire	155.760	No Conway Fire
154.860	Sheriff	155.910	State Police
155.340	Hospital/ambulance	161.250	Conway Scenic RR
155.475	Conway PD (car to car)	493.950	Appalachian Mtn. Club

Remember the crash of "U.S. Air" flight 405? J. Rello lives in ***Queens, New York***, and he has provided a list of frequencies that were active during the emergency.

35.640	Booth Memorial Hosp	156.800	Harbor units, USCG
47.660	Bellevue Morgue units	158.340	Jamaica Hosp in Queens
154.430	New York City fire	158.460	Jamaica Hosp in Queens
156.600	Ship to shore	478.012	NY City EMS

Hopefully, that was not a bad omen for the return trip to ***Hawaii!*** This time, you can check-in and stay a while. Jim Helm has provided a comprehensive list of hotel frequencies.

Aston Hotels	461.025, 461.600
Colony Surf Hotel	463.850
Hale KOA Hotel	461.100
Halekulani Hotel	462.900, 461.950, 463.475
Hawaii Prince Hotel	854.2875, 855.2875, 929.3375
Hawaii Monarch Hotel	461.400
Hawaiian Regent Hotel	462.825, 463.525
Hilton Hawaiian Village	461.150, 461.650, 462.800, 463.800, & 464.825, 464.425
Hyatt Regency Waikiki	462.775, 464.225
Ilikai Hotel	461.275
Ilima Hotel	464.300
Imperial Hawaii Resort	154.540
Marine Surf Waikiki	151.805
Miramar Hotel	464.925
New Otani Kamaina Hotel	157.740, 464.3375, 464.975
Pacific Beach Hotel	461.100
Park Shore Hotel	464.425
Quality Inn Hotel	464.775
Sat Grand Waikiki Hotel	466.725
Surfrider Hotel	463.625, 461.900, 466.900
Sheraton Princess Hotel	463.625, 462.850
Waikiki Banyan Hotel	464.575
Waikiki Beach Hotel	461.250
Waikiki Beach Comber	151.685
Waikiki Joy Hotel	466.950
Waikiki Parc Hotel	463.325
Waikiki Resort Hotel	461.825
Waikiki Sand Villa	463.3625
White Sands Resorts	463.475

To invite the frequency exchange to your neighborhood, send a list of your favorite frequencies to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Computer Corner

Planning a vacation? I've got an IBM compatible text program that contains an eight-page frequency list for the following vacation areas: Las Vegas Casinos/Hotels, Disney World, Disney Land, Baltimore Aquarium, Bush Gardens, Sea World, Virginia Beach, and Colonial Williamsburg.

The frequencies on the disk are in ASCII mode. They can easily be loaded into any IBM compatible text program for sorting, printing, etc.

The information is contained on one 5-1/4" floppy disk. To order the disk, send $5.00 dollars to P.O. Box 173, Prospect Park, PA 19076. The small fee covers the postage, disk mailer, floppy disk, and reproduction costs.

Flying With Cellular

The Federal Communications Commission (FCC) has ruled that cellular phones can be used in aircraft that are on the ground. However, the use of cellular phones while airborne is prohibited.

The FCC was concerned that the extended range of airborne cellular phones would cause interference to local cellular networks. Exactly how the FCC will enforce the ruling is unclear, especially since the Commission has authorized the installation of cellular phones into private aircraft.

Cellular Criminals

A Norfolk, Virginia, resident was sentenced to 30 days in a halfway house and fined $500.00 dollars after admitting to monitoring and recording a cellular phone conversation.

As we all know, the monitoring of cellular phone calls was made illegal by the Electronic Communications Privacy Act. The frequencies to avoid are between 870.00 and 890.00 megahertz. If you should accidentally stumble into this frequency range, don't make a tape recording—it could become a very costly souvenir.

Seismic Scanning Sequel

In a previous column, I provided a list of frequencies for earthquake transmitting stations located in North Carolina and California. Since that time, your letters have made it clear that seismic scanning is possible throughout most of the United States.

Seismic transmitters use low power and high gain Yagi antennas. The frequencies utilized are between 216.00 and 217.00 megahertz. If you hear a continuous tone, it's a good chance that you're monitoring a seismic station. When the tone changes, that indicates a vibration or movement in the Earth.

Photo Radar Busted

In Sacramento, California, the city council voted unanimously to discontinue the use of photo radar. When police began using the system in October 1990, nearly 500 tickets were issued, netting the city about $8,500 in traffic fines.

But civil liberties lawyers have fought the fines, referring to the system as an invasion of privacy. Lawyers compared photo radar to George Orwell's futuristic novel *1984* in which people live in a police state watched over by "Big Brother."

Police were also forced to deal with irate car owners who were not the driver pictured in the photo. When police asked vehicle owners to identify the driver in the photograph, most people simply refused. In addition to the legal problems, the photo radar system was plagued with mechanical problems that required regular repairs. (News clipping from the *Sacramento Bee*.)

Calling 911

You may be surprised to learn that only six percent of calls to a 911 Police emergency number are actually classified as an emergency. Dispatchers report that countless calls are received from people who misdial the "411" number for telephone information. Other folks call 911 and request info on court cases, parking regulations and city sponsored events.

During the holidays, people call 911 to extend holiday greetings to the police department. Late night callers to 911 often turn out to be lonely folks who simply want to talk with someone. (News clipping submitted by Dr. George Hrycelak.)

Just Say No

Residents in Candia, New Hampshire, recently turned down a proposal for a 190-foot transmission tower. The tower was proposed by "Cellular One" and would have been erected on a six-acre wooded lot.

Candia residents opposed the tower, saying that they feared electromagnetic radiation. Cellular One said that the tower would only produce a few hundred watts of power. By comparison, television towers transmit 50,000 watts or more.

But most residents were not convinced. Concern over electromagnetic radiation is a hot topic in Candia. The town also turned down an MCI proposal for a microwave tower.

See you in August. 'Til then, keep on scanning!

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Digital programmable 200 channel hand held scanner with raised button keyboard for easy programming of the following frequency ranges: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-956 MHZ.* Features include: Scan delay, memory backup, key pad lock, sidelit liquid crystal display, channel lockout, 10 twenty channel banks, direct channel access, automatic search, full one year factory warranty, 10 priority channels, Ni-Cad battery pack, AC adapter/charger, flexible rubber antenna carry case are all included. Size is 2-11/16"Wx1-3/8"Dx7-1/2" high. (Optional extended 2 yr. warranty $29.99, 3 yr. extended warranty $39.99.)

(*Excludes Cellular)

#CC-008 Heavy Duty Leather Carry Case **$27.99**

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BEARCAT BC100XLT	159.99	(7.00)
BEARCAT BC140	94.99	(7.00)
BEARCAT BC142XL	94.99	(7.00)
BEARCAT BC147XL	99.99	(7.00)
BEARCAT BC200XLT	279.99	(7.00)
BEARCAT BC205XLT	239.99	(8.00)
BEARCAT BC310A	85.99	(7.00)
BEARCAT BC330A	109.99	(7.00)
BEARCAT BC400XLT	99.99	(7.00)
BEARCAT BC560XLT	109.99	(7.00)
BEARCAT BC760XLT	269.99	(7.00)
BEARCAT BC800XLT	249.99	(8.00)
BEARCAT BC855XLT	186.99	(8.00)
BEARCAT BC950XLT	249.99	(7.00)
COBRA SR901	74.99	(6.00)
MIDLAND CB Radios	*In Stock*	
COBRA CB Radios	*In Stock*	
UNIDEN CB Radios	*In Stock*	
Two-Way Radio Batteries	*In Stock*	
Scanner Antennas	*In Stock*	
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RELM RH606B	414.99	(9.00)
RELM UC202 (2 or more)	129.99	(6.00)

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BC002	59.99	GRE8002	79.99
PS001	12.99	GRE-HH	54.99
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RELM RH-256NB HIGH BAND TWO-WAY RADIO

SPECIAL PACKAGE DEAL

$339.99

(Plus ($9.00 Shipping Each)

16 channel digital readout two-way radio. Covers high band frequency range of 148-162 MHz without retuning. Perfect two-way radio for ambulance, police, fire, tow trucks, taxis, commercial companies who use this band. Features include CTCSS tones built-in, priority, 25 watts output, channel scanning, back lighted keyboard, message light, time out timer, scan delay, external speaker jack. Size is 2¾"Hx6½"Wx10¾"D.

SPECIAL PACKAGE DEAL includes RH-256NB, mobile microphone, ¼ wave body mount antenna, mobile mounting bracket and mobile power cord all for the low price of $339.99

UNIDEN BEARCAT BC-400XLT

$99.99

($7.00 shipping)

Our best selling mobile scanner. 16 channel, AC DC. programmable, digital, AC DC cords, telescopic antenna, mobile mounting bracket weather search, priority, 29-54 MHz, 136-174 MHz, 406-512 MHz external speaker and antenna jack

BEARCAT BC-100XLT

100 Channel Digital Programmable Hand-Held Scanner

$159.99

($7.00 shipping)

Our best price ever on a full featured complete package hand-held scanner. Manufactured by Uniden. Features include 11 bands of weather, aircraft, public service, trains, marine, plus more (29-54 MHz, 118-174 MHz, 406-512 MHz), 10 channel banks, 10 priority channels, lighted LCD display, earphone jack, channel lockout, AC/DC operation, scans 15 channels per second, track tuning. Special package deal includes following accessories: AC adapter/charger, rechargeable Ni-Cad battery pack, flexible rubber antenna, carry case.

SANGEAN ATS-803A

SHORT WAVE RECEIVER

$168.99

($7.00 shipping)

AM/FM/LW and 12 shortwave bands plus FM stereo, BFO for SSB reception, clock radio. Includes AC adapter, telescopic antenna, stereo headphones, and shoulder strap.

BEARCAT BC-147XLT

16 CHANNEL BASE SCANNER

$99.99 *($7.00 Shipping)*

Programmable, digital, AC/DC operation Frequency coverage 29-54 MHz, 136-174 MHz, 406-512 MHz. Weather button, priority, lockout button, squelch includes AC adapter, telescopic antenna.

SPECIAL!! LOWEST PRICE EVER FOR A PROGRAMMABLE SCANNER

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SR-901

AVAILABLE ONLY FROM SCANNER WORLD

ONLY! **$74.99** Each

(Plus $6.00 Shipping Each)

$69.99 (2 or more)

Features include: 10 programmable channels, one touch memory programming, external speaker jack, 29-54 MHz, 136-174 MHz, 400-512 MHz, squelch, lockout, full frequency digital readout, AC or DC operation, retains memory up to 3 days without power, scan button. Includes AC adapter, telescopic antenna, and complete operating instructions. Size: 7¼" W x 2" H x 7¼"D. One year factory warranty.

(Optional mobile cigarette lighter cord #901MPC **$4.99**)

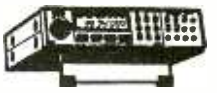
UNIDEN BEARCAT BC 800XLT

DIGITAL BASE SCANNER

$249.99 *($8.00 Shipping)*

Receive police, fire, ambulance, cordless phones, marine, trains, weather, ham, stock cars, public service plus much more. Frequency coverage 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-912 MHz (continuous). 40 channels, AC/DC operation, digital programmable, memory backup requires 2 AA batteries (not included), telescopic antenna included, AC power cord included, external speaker jack, external antenna jack. Dimensions: 9¼D x 4½"H x 12½"W. Channel lockout, direct channel access, scan delay, priority, digital display, auto weather button, automatic search, track tuning.

UNIDEN BEARCAT BC-950 XLT



$249.99 *($7.00 shipping)*

Digital Programmable 100 Channel Scanner

BC-950 XLT covers the following frequencies: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-954 MHz (excludes cellular). Features compact size of 6-5/16"Wx1-5/8"Hx7-3/8", scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied, one year factory warranty, search, direct channel access, track tuning, service search including preprogrammed frequencies by pushing a single button for police fire/emergency, aircraft, weather, and marine services plus exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only $34.99 plus a CTCSS tone board is available for only $59.99 to make this the number one scanner available in the USA. Optional cigarette lighter plug #950 MPC $4.99.

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100 channel digital programmable mobile scanner, turbo scan up to 100 channels per second, lockout, priority, built-in automatic 2 second delay, dimmer control, back lighted keyboard, track tuning, direct programming of frequencies from front keyboard plus you can also program MR 8100 from your IBM compatible PC computer with software and cables included with scanner from Scanner World. Frequency coverage: 29-54 MHz, 118-174 MHz, 406-174 MHz, 406-512 MHz, 806-956 MHz. Dimensions: 7.9"W x 5.8"H x 1.9"D. Earphone jack, BNC antenna jack, DC power cord, mobile mounting bracket, internal memory backup, bank scanning; 10 banks of 10 channels in any combination.

MODEL: FB-911 ORIGINAL FIRE BOX PHONE

$54.99 *($5.50 Shipping Each)*

13 memory phone, 3 direct access emergency memories, auto redial, ringer on/off, top light flashes when telephone is ringing, tone/pulse switchable, desk/ wall mount, front door closes for authentic fire box appearance, FCC approved. Size: 16"Hx8½"Wx7"D.

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"Uncle Skip" Arey, WB2GHA

GEnie T.AREY1

Laid Back Listening

There is nothing quite like taking a vacation. Even though I am widely known for being multi-careered, at least a few times a year I try to take my nose off all of my grindstones in favor of rest, relaxation and rejuvenation. Somebody once told me that the French take between four and six weeks of vacation every year. Now that they have Disney World maybe I should translate my resume into French and take off for Gallic shores.

Before you pack your bags, could you write a radio article, Uncle Skip?

Don't get bummed out, Boss! I am a tried and true American and loyal *MT* columnist. But the fact is that our world of advanced "labor saving" devices and the need to earn money to acquire them have left us with blessed little free time to enjoy it all. Even the radio listening hobby can get awfully stressful if one gets bound up in increasing station totals, QSL chasing and other "competitive" aspects of monitoring.

Old Uncle Skip holds with the notion that vacation from work should also be a time of vacation from the enjoyable, yet tedious, aspects of the listening hobby. It's okay to play radio during vacation. I just tend to lean really hard on the word "play." So this must be where we jump in the hammock and rock to the beat of...

UNCLE SKIP'S GUIDE TO SUMMER LISTENING
Short on Work— Long on Fun

Old Uncle Skip has always maintained that radio monitoring people have more fun than everyone else. During the summer months, many interesting and exciting events go on all around this great country of ours. While we will no doubt spend some time enjoying these events with "regular" folks, we can tap into a whole different level of fun by monitoring some of the behind-the-scenes activities associated with all this summer fun.

Finding radio fun on vacation can happen almost anywhere you look.

Last issue was devoted to developments in portable equipment for vacation listening. This month's episode is going to cover some of the neat new things to listen to whilst going portable. Of course, if you are a stay-at-home type you can just stretch the headphone cord out to a shady spot in the back yard and have the same fun as the rest of us. There will be stuff for both shortwave and scanner folks in here so stick around, Compadre.

New Wave Scanning

If you are like many scanner users, you probably have your memories packed with a fairly familiar group of frequencies. I've said it once and I'll say it again: Old Uncle Skip recommends that you keep at least ten percent of your available memory clear for chasing down unusual stuff when it presents itself. Summertime activities are filled with scanning opportunities you may not have considered. Just tracking a few of these resources will put that ten percent to good use.

One of the greatest ways to find new things to listen to is to think back to what was fun in the summer when you were young. For example, every summer the circus comes to town! Like most modern businesses, circuses and carnivals have come to rely on radio as a tool to get the job done. Ringling Brothers' Barnum and Bailey Circus tours throughout the summer as two different units in order to cover all the dates across the US of A. This show's common frequency is 151.625 MHz.

Other circuses and carnivals also benefit from radio. A little frequency hunting will turn up some very different entertainment. Hearing the "carnies" talking about the female customers may lead you to lock up your daughters whenever the carnival is in town. Don't forget that circus and carnival activities usually signal increased police, fire and EMS activity due to traffic and crowd control issues.

I Love a Parade

And you should, too, if you are a radio monitor. Listening in on the process of "forming up" a parade is great fun. There is always the band that arrives late, the cub scouts who are in the wrong line, and the antique car that breaks down half way through the march. Parade Marshals are usually local public officials utilizing township frequencies that you already have tracked down so listening in is a breeze. In most parts of the country, the units bringing up the rear are regional fire departments. I always enjoy the ongoing chatter on the engine to engine channels. You get a feel for what it's like to be in the parade instead of just watching it.

Be a Sport

While football fans will probably disagree, summertime seems to bring a lot of people outside to attend all kinds of sporting events. Almost any sport from little league through professional may be served by radio support. In some cases radio has even revolutionized the sport itself.

Back when Uncle Skip was a pup, you could attend an auto racing event and see guys holding up big blackboards to tell the driver important information about what was going on around him. (That was well before the days when women entered into motorsports.) Modern auto racing benefits from two way radio communication between the driver and his or her crew. The pit crew can give the driver information and strategy while the driver can advise the team of the condition of the car and the track.

This communication can be picked right out of the sky by anyone with a scanner. Now you can find out what the race leader really thinks about the driver who just passed and took the lead.

While few other sports have taken direct radio communication with the athletes to the degree that motorsports have, you will find radio being used for a myriad of reasons at most sporting events. Also, any sporting event is a gathering of people that requires traffic and crowd control. Stadium support personnel and security can also be fun to monitor with one ear while enjoying the game with the other. If the event is covered by local or national TV and radio, try to listen in on the feed frequencies for even more fun.

High Flying Summer Listening

Many summer events are blessed with the presence of one of the world famous Goodyear Blimps. This is another source of fun summer listening: 132.000, 151.625, 465.912, 465.937 and 465.962 MHz are all places to tune when the blimp is in town.

Every summer signals a series of airshows held across the country. Precision flying teams such as the Blue Angels and the U.S.A.F. Thunderbirds bring excitement wherever they go on tour. If the Blue Angels are nearby, monitor 121.900, 142.000, 142.025, 143.000, 143.600, 241.400, 250.800, 251.600, 275.350, 360.400, 384.400, 391.900, 395.900 MHz. If the

Thunderbirds come to town check out 120.450, 140.400, 141.850, 236.550, 236.600, 241,400, 250.850, 273.500, 283.500, 294.700, 322.300, 322.600, 382.900, 394.000, 413.025 MHz.

Airshows can also include an exhibition by the United States Army Golden Knights. This parachute team can be heard by monitoring 32.30, 42.35 and 123.400 MHz.

Regardless of the airshow you are attending, 123.400 and 123.450 are common frequencies used for control at most airshows. These frequencies are usually buzzing because of the many planes and scheduled flybys that must occur with some semblance of order and decorum.

Fun Raisers

The summer brings out all manner of walking, running and bicycling events that cover extended distances. No matter if it is the local church's five mile walkathon or a professionally organized 150 mile bike ride, you can find radio in use for control, organization and safety. In many cases the radio support for such events is provided by local amateur radio clubs. Monitoring the area's 2 meter repeater frequencies should point you in the right direction for this sort of listening fun.

Special Events Stations

Speaking of amateur radio, it is high time I talked about some light listening for people with shortwave receivers. A great place to have fun listening throughout the summer is the lower 25 kHz of the General class phone subbands: 3850-3875 kHz LSB, 7225-7250 kHz LSB, 14225-14250 kHz USB, 21300-21325 kHz USB and the Novice/Technician class phone subband 28300-28500 kHz USB.

While ham bands can be fun to tune anytime, on the weekends these frequencies will put you in touch with "Special Events" stations that operate to commemorate all manner of events, past and present. Hams will get together and transmit from historic locations, state and county fairs, places with unusual names, and on local or national holidays just for the fun of talking to other hams. All of these stations are likely to welcome SWL verification queries and most offer special certificates in commemoration of the events.

If you are already a ham, why not get together with some friends and put on your own special event station? Don't forget to let *MT* know in advance so we can add your event to our monthly calendar.

Good-Bye Columbus

Don't forget that this summer is the commemoration of the 500th year since the voyage of Columbus. The Grand Regatta Colon and the 1992 Caravel Tour are going on as you read this article. Monitoring the maritime frequencies will put you in touch with this quincentenary event. (See the March issue of *MT* for more details.)

Hamcations

For some folks, doing something special with the amateur radio hobby *is* their vacation. This is the time of year to keep your ears open for DXpeditions to all parts of the globe. You see, some parts of the world do not have regular amateur radio operation. Dedicated hams will get together and travel to these locations to provide the rest of the amateur radio community with these rare contacts. Many of these places have no other form of radio service either so SWL monitoring can be a blast, too.

To get a handle on this aspect of the hobby keep your eyes peeled for DX tips that appear in the On The Ham Bands column. If you also have a scanner, monitoring the local 2 meter repeaters will turn up hams talking about rare DX activity.

Monitoring Lite

Okay, we have discussed a whole list of unusual listening opportunities guaranteed to jog your log book. But even these activities, while fun, can be too much work for a dedicated vacation loafer. Does this mean you should abandon the radio monitoring hobby totally for the duration of your vacation? Perish the thought old son! Allow Old Uncle Skip to put forth what some would see as a preposterous notion...**What is wrong with just turning on the receiver and listening at random?**

No log books, no tape recorders, no reference materials, no cares, no worries! Pure listening pleasure freed of the ties that bind. Your vacation can be a great time to retrogress to those first days when you started to play radio. We all really enjoyed that time when we didn't really know what we were doing. Remember how much fun you had before you got organized? Not only might you rediscover the hidden joys of listening, you might take the opportunity to show a new person how much fun monitoring can be.

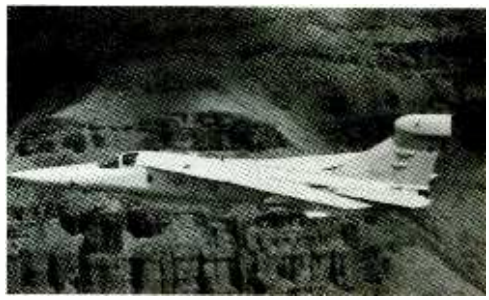
Spin the dial, listen to some music, tune in to a foreign language just to hear the rhythm of the speech patterns. Listen to the programming content instead of worrying about logging and QSLing. Fall asleep to a fading broadcast from who knows (or cares) where.

Vacations are meant to be breaks from our labors. That includes our labors of love such as radio monitoring. Have fun folks. Don't forget the sunscreen!

MT

Steve Douglass

Fedexpedition Continues



USAF

E-F-111 Raven

In last month's Federal File, we took you chasing active military frequencies in the outback of New Mexico. You say, you are a long way from this sunny western state, and your antenna isn't quite tall enough to pull in the listed New Mexico frequencies? Who knows, maybe you will take a trip to New Mexico and the listings will come in handy. Besides, the same techniques involved in our scanner expedition can be applied when planning *your* scanning expedition.

Have Scanner Will Travel

If you remember in last month's report, before we went on our scanning expedition we obtained maps of the area we were visiting. The maps used were aviation maps and USGS topographic maps. These maps can be a big advantage when planning your monitoring expedition.

One of the areas that I had wanted to visit for quite some time was a little-known military operations area located just west of Cannon AFB, near Clovis, New Mexico. F-111 Aardvarks from Cannon, B-1B bombers from Dyess AFB, Texas, and other Air Force attack aircraft from across the U.S. use the nearby Melrose bombing range for perfecting their bombing techniques.

With the help of the maps, I wanted to locate the range and possibly observe some of the bombers at work. I had also brought with me my trusty Pro-2004 and a Realistic DX-440. Although I only live about 130 miles from the range, I had only been able to monitor bombers coordinating their exercises at Melrose on shortwave. Bombers check in with Melrose Range Control before starting their attack runs on 9.014 MHz (USB). Try listening in on the weekday afternoons as aircraft coordinate their time on the range with *"Raymond 14"* (Cannon AFB Command Post).

Unfortunately, the bombers always switched to a local UHF tactical frequency when on the range, and I hadn't been able to find that channel. I planned to remedy that situation with the PRO-2004 set to search, the DX-440 set to 9.014 MHz and with a little help from an Optoelectronics frequency counter I had borrowed from a friend. With Cannon being a Tactical Air Command Base, I also programmed the scanner with all known TAC frequencies. I installed it all in the car and hit the road.

Bombers and Gunslingers

Although not marked on regular road maps, I knew the general area in which the range was located. The aviation maps showed the range situated between the New Mexico towns of Ft. Sumner and Melrose, on U.S. Highway 60 on the western side of the state.

Ft. Sumner is famous for being the burial place of the infamous western gunslinger, William Bonne, alias *Billy the Kid*. If you are ever in the area, make sure you stop in at the Billy the Kid Museum. Be forewarned that your kids will be disappointed to see that Billy the Kid doesn't look at all like Emilio Esteves in the movie *Young Guns*, and in actuality, is rather uncharismatic and homely.

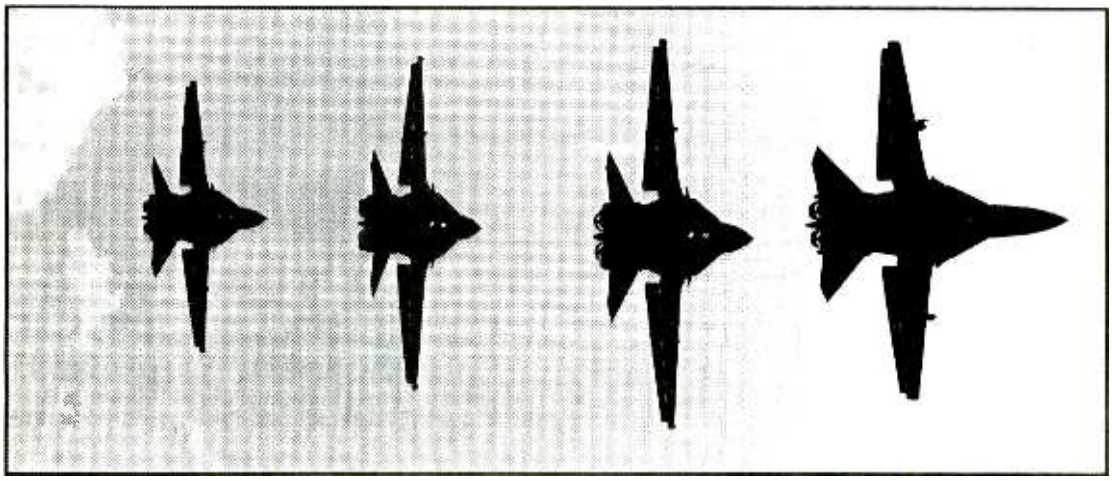
While I was viewing a collection of antique pistols at the museum, the glass case began vibrating. Somewhere overhead, jets streaked by rattling the museum, probably on their way to the Melrose Range. I was struck by the fact that just miles away high-tech supersonic bombers were expending more gun powder than Billy Kid could have used in ten lifetimes. Do you think that in one hundred years people will tour a museum and view F-111s as antique weapons? Maybe by then bombers will be as obsolete as the old rusty deer rifles and six guns on display in the museum.

Scanning on the Range

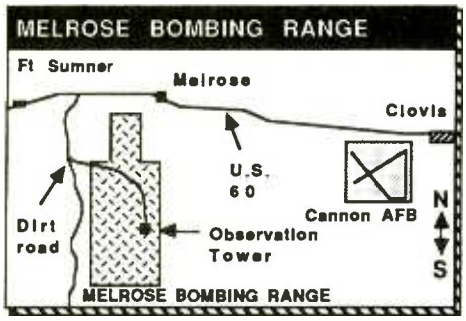
With the help of the topography map, I was able to locate a dirt road that ran along the western border of the range. Even with the map, the road was hard to locate. I passed it twice before I finally saw it. The dirt road went over a set of railroad tracks and across some gently rolling green farm land. It didn't look like the place to put a bombing range. We followed the bumpy road for about three miles and were about to give up when the car was rocked by the roar of jet aircraft as they passed by what seemed like inches above us. Shaken, yet excited, I peered out the window to see two F-111D Aardvarks break sharply to the left, their racks laden with bombs. I looked at my wife and said matter-of-factly, "Honey, I think we found the range."

Not only did we find the range, we were practically a target. The F-111s dropped their bombs only about a half a mile from where we parked. We had great seats and watched the mini-explosions erupt on the range just to our left. The Aardvarks came in low and slow and pounded the range with everything they had, and even after they had spent their bombs they continued to attack the range with simulated target runs.

Although the PRO-2004 was searching through the UHF frequencies as fast as it could, I was having no success in finding the Melrose frequencies. I stepped out of the car with the Optoelectronics counter in hand and extended the telescopic whip antenna.



Composite photo of F-111 from Canon AFB buzzing author at Melrose Range.



The counter flashed numbers randomly as it sniffed the air for nearby radio transmissions. No luck; the bombers were just too far away to activate the counter.

I wished they would fly closer to our position and maybe the counter could lock on their signals. As if they had heard my wish, one of the F-111s banked to the right and came toward us. The streaking bomber passed directly overhead by about 100 feet. Glancing at the counter, I noticed it had locked up on the frequency 376.100 MHz. I pressed the hold button and locked it into the counter's memory.

I quickly entered the frequency in the PRO-2004. Bingo! Soon, the car was filled with the chatter of the F-111s coordinating their attack. My wife and I sat back and watched and listened as we had a ringside seat, complete with audio track to our free airshow.

The F-111s continued their attacks for 20 minutes. From time to time, I would step outside and take some pictures of the Aardvarks strutting their stuff. My wife yelled, "I think they see us!" I ducked back into the car. "Duke Six One, do you see that car on the road?" one of the F-111s radioed. "He's taking pictures of us," the other transmitted. "Let's really give him something to take pictures of."

I looked down the road and could see one of the F-111s lined up on it and heading right toward us. I grabbed my camera and stepped outside. I wanted to get a shot of this. The F-111 buzzed us flying only about fifty feet above the car. The Aardvark's pilot kicked it into afterburner and peeled off into the sky. The deep rumbling of the engines vibrated deep into my chest.

Despite the noise and the excitement of having a bomber bearing down on me, I still had the presence of mind to click the camera. I held down the shutter and let the motor drive click off the rest of the roll. No sooner had one of the bombers buzzed us than the other did the same from the opposite direction. Both F-111s disappeared into the blue New Mexico sky.

MELROSE BOMBING RANGE & OTHER MELROSE AREA MILITARY FREQUENCIES

Frequency	Description
376.100 MHz	Melrose Bombing Rng
379.200	Albuquerque Ctr UHF military hand off to Melrose Rang Cntrl
358.300	Cannon AFB approach
397.200	Cannon AFB departure
348.400	Cannon AFB tower
378.800	Cannon Clnc/Del
372.200	Cannon TAC CP
322.800	Ar-602/625 primary
319.500	Ar-602 secondary
322.800	AR-625 secondary
344.600	Cannon AFB metro

MAILBAG

Aurora Update

Several California monitors write in with some interesting intercepts that may be those coming from secret "black" aircraft being tested in the area. Many have reported hearing strange transmissions on 119.250 MHz, (which is listed as an Edwards AFB frequency) involving what sounded like flight test communications. This is not irregular considering Edwards is well known for being the world's premier flight test facility. What is strange is that the transmissions took place in the early hours of the morning. The instructions were to an aircraft flying at extreme altitude, above 60,000 feet.

The communications were similar to those used to guide down space shuttles with detailed instructions on altitude, miles above glidescope, etc. One monitor reported the instructions came from "Joshua Control" (Edwards AFB) and were to an aircraft with the callsign "Gas Pipe." The instructions continued until the aircraft landed. Many monitors heard the same type of communications on two different occasions. This possibly indicates that some kind of craft reentering the atmosphere has landed at Edwards.

The only type of aircraft capable of that type of performance is a hypersonic one. If it's not the space shuttle, it could possibly be the much rumored "Aurora Project" hypersonic aircraft being test flown over California by the Air Force. (Incidentally, inside sources say that the name "Aurora Project" has been changed by the Air Force due to the many security leaks.)

As many *MT* subscribers are already aware, it has been widely known that the Air Force is testing a hypersonic aircraft and is very close to fielding them as operational reconnaissance aircraft. Leaks indicate that it may be soon based at Beale AFB, California. Monitors in the Beale area have reported radio traffic involving groups of F-117As and an unknown diamond shaped aircraft on refueling missions. They also report hearing the callsign "Gas Pipe" from an unknown aircraft operating in the Sacramento area.

Whatever is behind these strange sightings and communications, rest assured that *Monitoring Times* and the Federal File won't be far behind!

MT

James R. Hay

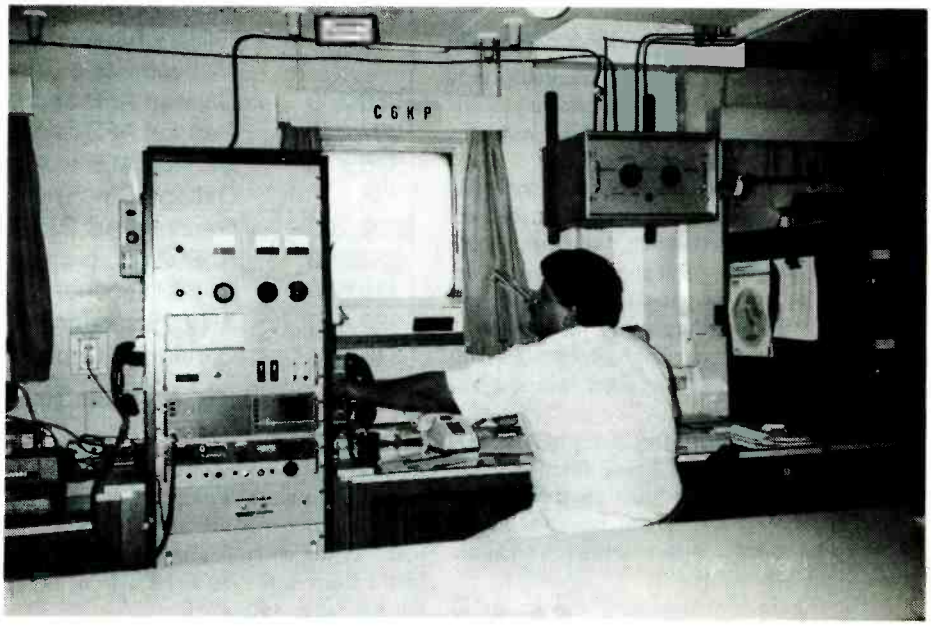
Another One Bites the Dust!

On March 28, 1992, the Canadian Coast Guard Radio Station at Victoria, British Columbia was closed. Closing the station does not represent, in this case, any sinister indication of the demise of radio as we know it, but rather an attempt to consolidate operations and improve service. One of the problems with a station manned by one operator per shift is that there is no one on duty if the operator needs to use the washroom or is called away from his operating console for any reason.

The transmitters and receivers of Victoria Coast Guard Radio (VAK) are now remotely controlled from Vancouver Coast Guard Radio (VAI). While the 2 MHz frequencies have not yet come back into service from Vancouver, this should be the case by the time you read this column.

To bring things up to date, below is a listing of the frequencies for Vancouver CG Radio (VAK) including the Victoria peripheral sites.

MHz		
0.430	CW	Sheringham Point, BC
0.440	CW	Vancouver, BC
0.484	CW	Sheringham Point, BC
0.500	CW	Vancouver, BC
0.500	CW	Sheringham Point, BC
2.054	SSB	Vancouver, BC
2.054	SSB	Sheringham Point, BC
2.182	SSB	Vancouver, BC
2.182	SSB	Sheringham Point, BC
2.458	SSB	Sheringham Point, BC
4.2143	RTTY	Vancouver, BC
4.235	CW	Vancouver, BC
4.384	RTTY	Vancouver, BC
4.384	SSB	Vancouver, BC
6.3185	RTTY	Vancouver, BC
6.513	SSB	Vancouver, BC
8.4285	RTTY	Vancouver, BC
8.737	SSB	Vancouver, BC
13.095	SSB	Vancouver, BC
16.822	RTTY	Vancouver, BC
17.263	SSB	Vancouver, BC
22.3685	CW	Vancouver, BC
22.3915	RTTY	Vancouver, BC
22.753	SSB	Vancouver, BC
156.800	FM	Vancouver, BC
156.800	FM	Bowen Island, BC
156.800	FM	Mount Parks, BC
166.800	FM	Watts Point, BC
156.800	FM	Sooke, BC
156.800	FM	Mount Halmoken, BC
157.100	FM	Vancouver, BC
157.100	FM	Bowen Island, BC
157.100	FM	Mount Parke, BC
157.100	FM	Sooke, BC
157.100	FM	Mount Halmoken, BC
161.650	FM	Mount Parke, BC
161.825	FM	Bowen Island, BC
161.825	FM	Mount Halmoken, BC
161.900	FM	Vancouver, BC
161.900	FM	Mount Parke, BC
161.900	FM	Watts Point, BC
161.900	FM	Sooke, BC
162.475	FM	Bowen Island, BC
162.475	FM	Mount Halmoken, BC



The radio room of Carnival's Festivale ship, callsign C6KP, sails in the Caribbean. Are they also adding a cellular option? Passenger Paul Mundt of Lombard, IL, says, "This ship also had fax and satellite capabilities and will soon have 'car phone' type hookup available from all the ship ports of call, I was told."

No system is perfect...

A while back, the mail brought several clippings sent in by Hugh Miller of Woodinville, WA, describing the sinking and subsequent rescue of the crew of a crab boat off the West Coast. The F/V Caroline was leaving the mouth of the Columbia River when it was struck by an unexpected wave. Before there was time to do anything more than don lifejackets, the 43 foot boat rolled onto her side and sank.

There was no time for a distress call on the radio. The only indication of the incident was the signal from the Caroline's Emergency Position Indicating Radio Beacon (EPIRB) which sends out a signal on 405 MHz for Search and Rescue Satellites (SARSAT). Usually two signals are sent by the EPIRB. One is used for the location of the beacon, and the second sends identifying information. In the case of the Caroline, only the first signal was received and retransmitted by a malfunctioning satellite to a ground station. The identifying information was lost.

The position which was relayed to the Search and Rescue center in Seattle showed that the beacon was inland in Oregon. Since 98% of first reports are false alarms, the land based position was filed with the false alarms and a confirming second signal was awaited.

The second signal was relayed properly by a different satellite an hour later. At that time a search was begun and over the next hour the three crewmen of the Caroline were rescued.

According to the articles I received, one of the crewmen died shortly after being admitted to a hospital and another was in critical condition-

The third, and oldest, was released the following day after being treated for hypothermia.

This incident certainly demonstrates that no system is perfect, but it also shows that things can happen on the water so quickly that the distress call never gets made on the radio. Don't be surprised when you are monitoring maritime frequencies to hear a search starting up when you never heard a call for help. In the case of the Caroline, the call went via SARSAT and was unfortunately delayed by an hour due to a malfunctioning satellite during what, for that crew, may have been critical time.

Help is just a phone call away?

In Canada, the two cellular telephone companies, Bell Cellular and Cantel, have been offering a service which connects cellular telephone users with a Coast Guard Radio Station. The primary use of the service is for motorists who report incidents which they see from their cars. While some boaters report their problems via the cellular telephone, the Canadian Coast Guard still encourages the use of the VHF-FM radio as the primary means of distress communications.

According to the Commandant's Bulletin of August 1991, the Fifth District of the United States Coast Guard is also looking into cellular telephone. Bell Atlantic Mobile Systems has been offering a cellular telephone number during the summer which boaters in distress can use to report their difficulties.

...the United States Coast Guard is also looking into cellular telephone.

It appears that in the U.S., some boaters prefer to use the phone than the VHF radio for distress communications and the service is being offered to test its usefulness.

As in Canada, the U.S. Coast Guard urges boaters to continue to use VHF radio as the primary means of distress communications. The coverage of the cellular system is not guaranteed over the waterways, whereas the VHF system is designed for these areas. Also, being a point-to-point system, the cellular telephone system does not offer the possibility of mutual assistance. Even if you make your call to the Coast Guard via cellular telephone they will have to relay a distress call on channel 16 (156.600 MHz).

In Canada, the number for the service is *16; in waters between Ocean County, NJ, and Chincoteau, VA, and in Chesapeake Bay north of Tangier Island, the number is *CG.

The cellular service is another reason why scanner enthusiasts may notice fewer distress calls, but possibly more relays of distress calls after no initial call was heard. Thanks are due to Vince Cerutti of Ann Arbor, MI, for sending in the Commandant's Bulletin.

Your comments, questions and suggestions are always welcome. A self-addressed envelope (not stamped, since I live in Canada) would help speed a reply. Material which I think is of interest to other readers will be included in future columns with appropriate credits. Please keep your letters coming and good listening until next time.

MT

Homing In

Let's face it, summertime is not the prime season for longwave DX. With brutal static crashes and our numerous non-radio activities, beacon DXing usually goes into low gear during summer.

But don't pack your gear away just yet! Summer is also a great time to get to know your locals a little better. If you live fairly close to some beacon sites and enjoy a challenge, why not take to the outdoors with a portable receiver and find out exactly where they're located. Hunting for beacons is a fun way to develop direction finding (DF) skills and it gives you a new appreciation for the signals you hear. Best of all, you won't need anything fancy—just your portable receiver, a map and a compass.

Direction finding usually conjures up images of elaborate loops and other specialized tracking equipment. While it is true that costly and more accurate systems do exist, virtually all LW portables already contain the means for basic DF work. If you've ever turned the cabinet of a portable set during LW reception, perhaps you've noticed the peaks and nulls (dips) in received signals. This directional characteristic is due to the set's built-in ferrite rod antenna, and it can be used to find the approximate location of a transmitter.

Ferrite antennas exhibit a null for stations located off the ends of the rod and a peak for stations off the broadside. The null should be used for DF work because it gives a more sharply defined bearing. Ferrite rods are normally installed along the lengthwise dimension of the radio. To get a DF bearing, simply orient the set for a null and look along the top of the radio cabinet (much like looking down the barrel of a shotgun).

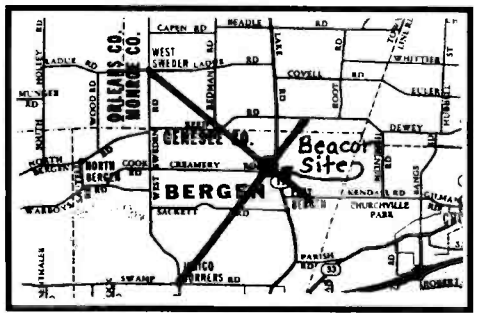


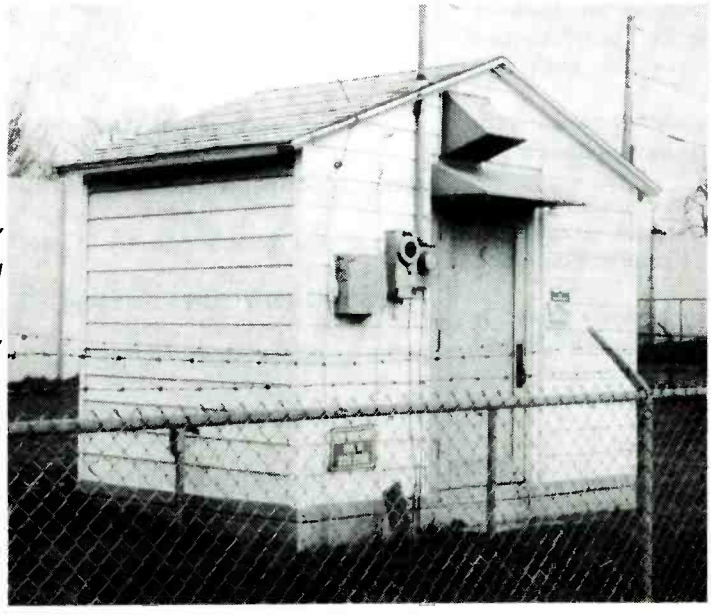
Figure 1: DF plots are a convenient way to start your search.

Before you go chasing a beacon, you'll want to be sure that it is indeed a local. If a beacon's signal is very strong and its strength does not change from day to night, you can be pretty sure the site is within convenient driving distance. To start your search, take two bearings at points separated by a few miles and plot them on a map as shown in Figure 1. The point at which the lines intersect is the best place to begin looking for the beacon. You may have to repeat the plotting process several times as you get closer and closer to the target.

The final and most exciting step is to visually pinpoint the beacon shelter. This may take a bit of patience as beacons can be found almost anywhere including in open fields, near runways and even in highly residential areas. By all means, obey all trespassing rules and be careful not to get stuck in off-road areas. You may want to conduct your final search on foot.

If you are lucky enough to be able to drive within 200 or so feet of the beacon, you may be able to hear the second or third harmonic of the transmitter on your AM car radio. The harmonic will be double or triple the beacon frequency. For example, to hear the second harmonic of a 344 kHz beacon, tune to 688 kHz. To hear the third harmonic of a 200 kHz beacon, tune to 600 kHz.

Pictures of beacons are always welcome at *MT*. Send me a photo of your catch, and you may see it here in "Below 500 kHz"!



This upstate NY beacon was found just 75 feet from a major expressway (RO, 400 kHz).

Updates

Periodically, the Coast Guard evaluates the system of aids to navigation to determine whether the conditions for which the aids were established have changed. This month brings news of significant changes in the Fifth Coast Guard District.

In the continuing trend toward moving sequenced beacons onto frequencies of their own, the following changes have been reported:

C40	Freq(kHz)	Location	Freq/Format Change
01	314	Oregon Inlet, NC	New beacon, continuous
VS	321	Diamond Shoals, NC	Beacon discontinued
Hi	309	Hatteras Inlet, NC	Changed to 306 kHz, continuous
CL	298	Ft. Macon, NC	Changed to 294 kHz, continuous
OA	298	Oak Island, NC	Changed to 303 kHz, continuous
FP	290	Frying Pan Shoals, NC	Beacon discontinued
OC	293	Ocean City, MD	Off air
HL	298	Cape Henlopen, DE	Changed to continuous

Equipment has been installed on the Cape Henlopen, DE, beacon (HL, 298 kHz) to transmit correction signals for the Differential Global Positioning System (DGPS)—a precise but still experimental location system. This does not affect the usability of the beacon for navigation, but you may notice a slight warbling of the Morse ID tone. Perhaps this DGPS support function may keep some beacons on the air even if their use for navigation declines.

End Notes

It's hard to believe, but this month marks a full year for me as Editor of "Below 500 kHz." I've enjoyed hearing from so many of you with your loggings, suggestions and support. Not only have I made some good friends, but it has helped me keep the column geared toward your interests.

If you haven't yet introduced yourself, why not write today in care of this column. I'd like to know how you discovered the longwaves, what equipment you use and what signals you're hearing. I can also be reached via CompuServe (address: 71064,1507) or through the *MT* BBS at 1-704-837-7081, although I only check for E-mail twice a month (due to telephone costs).

That wraps it up for July. Enjoy the nice weather, and I'll see you in a month!

MT

Karl Zuk

Welcome To Radioland!

Hidden in a Dallas, Texas, office building is the largest and most influential radio production company in the world. Every second of every day, millions of listeners nationwide tune in to the sounds of Satellite Music Network. Over ten percent of all the programming heard on American radio originates from their studios!

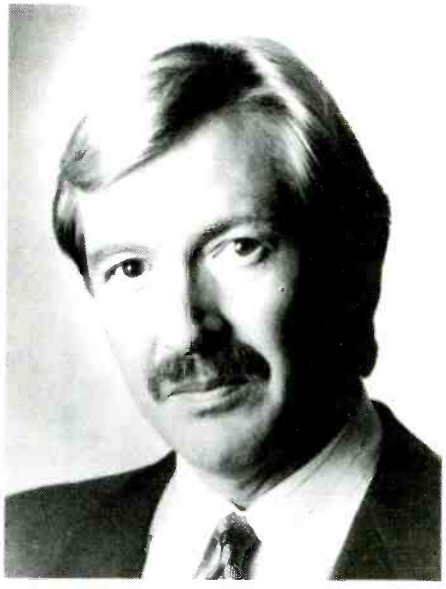
Imagine eight major radio stations all operating in the same place simultaneously. (Another two formats are produced in Phoenix, Arizona.) "DJs are on the air 24 hours a day," explains Marianne Bellinger, Public Relations Director for SMN. "We have really crazy, silly people running around here constantly, and rock stars coming in and out. It's Radioland!"

The secret of their success is providing a very professional and sophisticated sound to local stations regardless of their size or locale. Radio stations need only a satellite dish and receiver, and a computer that records and plays local advertising and announcements. SMN does the rest!

Ten unique musical formats are beamed continually, via the Spacenet 3 satellite, to over 1,000 stations all over the country. "We provide all the elements a station might need," Marianne explains. "Station operators could literally walk away for as much as a week depending on how automated they are. We also give them sales support materials, promotional ideas, and television spots that they can customize with their call letters and frequency. We give them everything they need to be successful in their local market."

Every SMN format tries to carve out a special niche. Stations can no longer afford to try to please everyone with broad-based formats. Using an extremely advanced marketing system called Prizm, SMN can develop demographic studies of a metropolis accurately detailing single city blocks. Stations can find a segment that is under-served by radio, pick a format that targets that group, and follow them as they change. Direct mailings and other promotional events can be positioned precisely for optimum results. Using SMN cost-effective formats and marketing techniques, it's difficult to fail!

SMN's music choices are almost endless. "If it's too loud, you're too old!" claims *Z-Rock*, SMN's hard hitting rock format targeted at 18 to 34 year olds. Current mainstream rock hits show up on *The Heat*. *Classic Rock* presents the best album cuts of the rock 'n' roll era. If you enjoy the softer side of contemporary music, you'll enjoy the sounds of *Starstation*, or the oldies on *Pure Gold*. The roots of rock 'n' roll keep spinning on *Kool Gold* with the sounds of the 50s and 60s. *Country Coast To Coast* has corralled America's hottest format, along with its riding partner *Traditional Country* offering a pure country sound without country-rock crossovers. *Stardust* ranks high with audiences over 35, featuring nostalgic sounds of yesteryear. *The Touch* is SMN's hottest moving format, scoring huge ratings with a dynamic, upfront, urban contemporary sound. With ten formats to offer, SMN can program up to ten stations in one market!



Robert Hall, Vice President of Programming for Satellite Music Network.

Local flavor is added to SMN's nationwide broadcasts so discreetly you may never know the program is originating across the country in a distant studio. Each music format features superstar disk jockeys who record local announcements for every station carrying their programs. Very specific moments in each broadcast hour are set aside for these "liners" to be included in the nationwide show. The disk jockey presses a button in the studio, and hundreds of these specialized drop-ins roll simultaneously; each station with its own customized message.

SMN personalities often visit the cities they serve for local promotions. Toll-free 800 numbers are available to all SMN listeners to call-in requests. "The listeners really have no idea. When they call in our jocks will ask 'Where are you calling from?' and the listeners always reply 'Don't you know?' The sound is very local!" says Marianne.

Only one network differs from this marketing strategy: the heavy metal sounds of Z-Rock. "Z-Rock is promoted as a world event. Everyone knows Z-Rock World Headquarters is in Dallas, and that's where Madd Maxx is." Madd Maxx Hammer is synonymous with the Z-Rock format, and also serves as host of "The Z-Rock 50," America's only hard rock countdown show.

Satellite Music Network provides an invaluable service to their 15 million weekly listeners, and to the individual station owners, too. Vice President of Programming, Robert Hall, explains that elements that make a radio station local, like community involvement, weather, and public services, are accomplished just as well, if not better, than when the stations had their own disk jockeys playing records. The monetary savings can be put back into a better morning newsman or more street promotion.

Hall gives this example: "Let's say Jim Zippo, the morning jock on Pure Gold, will do the entertainment, and then they'll flip over to a really strong local morning news person. He can also serve as an outreach person who visits The Rotary Club, The Lions Club, and becomes the center of focus for the radio station in its community service efforts."

Hall continues, "If a local market can only support four or five good radio stations, why should there be only four or five choices? Providers, like SMN, will be able to service more radio stations that will give people a lot of choice on the dial and make it economically feasible to have that kind of choice."

Marianne Bellinger is developing new markets for SMN all over the world. "We're on the air daily with a one hour show in The People's Republic Of China. We're also on the air in Hong

Be an American BandScan Reporter

See any stories about radio in the local paper? Send them to Monitoring Times, PO Box 98, Brasstown, NC 28902.

Kong with 90 second features on Metro News, and a show called *Harbour Nights* which is a new adult contemporary and new age jazz show on FM Select." Z-Rock is heard in Britain, with Poland, Russia, and Bangkok, Thailand possibly signing up soon.

Marianne also has Japan and Canada penciled in as the next frontier for SMN music service expansion. "We get letters from China all the time, and a lot of them are in English." Marianne receives many responses to SMN's bilingual program called *The American Music Hour*. "We received a three page letter from a girl whose grandfather had been killed during the Cultural Revolution. That's when she secretly started listening to country music. In this one letter was the whole history of China, over hundreds and hundreds of years, and she related it all back to our music programs and what meaning this music had to her and her life. It is, in some ways, what radio was forty years ago."

Bits 'N' Pieces

The freeze is over! The FCC is now accepting applications for new AM radio stations after a long hiatus. The Commission needed a time out to reassess their position concerning the allocation of frequencies on the band, and all the other technical considerations necessary when a multitude of stations need to coexist. The most important agenda has been solving the problem of interference between stations. Very little has been spoken about the upcoming expansion of the band to 1700 kilohertz.

Ownership rules have been completely reworked allowing large corporations to gobble up many more stations than in the past. Old regulations demanded that only one AM and one FM station could be owned per company in one market. Using a complicated formula weighing market size, numbers of station per area, and audience share, you can now own as many as three FMs and three AMs per market, up to 30 stations nationwide on each band!

Rules concerning limited marketing agreements also loosened. It is easier than ever for a station to become a superstation by simulcasting through surrounding outlets to expand their coverage areas and advertising strength using one management team and one programming source. Multiple station owners are thrilled about broadening their investments. Small stations feel the new rules give an unfair advantage to parties that now have nearly unlimited resources to force them to sell or bend to fierce competition. The implications of these rulings will shape the personality of American radio for years to come.

Mailbag

In our March profile of radio station CIAO, Brampton, Ontario, Canada, we mentioned that the station using the most transmitting towers was KLIF-AM in Dallas, Texas with twelve. Well, another Lone Star State station can do one better! "Dr. Media" sent a reminder that KRBE-AM, in his home town of Houston, uses 13 towers! Listen for them on 1070 kHz with 10 kilowatts during the day, and 5 kilowatts at night. Who paints and maintains all that steel?

New Station Grants

Enjoying the summer sun? Tune to these frequencies for some new fun! Lake Village, AR 103.5; Sherwood, AR 102.1; Zolfo Springs, FL 106.9; Cedartown, GA 88.3; Campbellsville, KY 99.9; Haughton, LA 103.7; Lacombe, LA 94.7; Searsport, ME 101.7; Chillicothe, MO 88.9; Kirtland, NM 102.9; Fort Ann, NY 91.7; and Casper, WY 90.3. Courtesy of *The M Street Journal*.

For Sale

A most unusual station is being offered this month. The Board of Education of The City of New York is selling their powerful 20,000 watt radio station WNYE. One of the first FM stations broadcasting in The Big Apple, WNYE has been heard in New York City schools for decades acting as a teaching aid and baby sitter. In the last few years, the station has lengthened its broadcast day by adding programming originating at Medgar Evers College. Radio France International also uses WNYE to relay their programs from Paris via satellite to New Yorkers en francais.

Now the station will be sold to the highest bidder "that provides a commitment to serving the diverse cultural and educational needs of the city. A minimum bid of three million dollars will be required," according to an advertisement in *Broadcasting Magazine*.

International Bandscan

If you have wondered what local radio sounds like in Canada, but you are too far away from Canadian stations to hear them, especially in the daytime, we may have a solution for you. Several Canadian stations operate shortwave relays of their daily programs for people who live in outlying areas far beyond their usual coverage area. Here's a quick list of the stations and their shortwave parallels: CBN/CKZN St. Johns, NF 6160 kHz; CBU/CKZU Vancouver, BC 6160 kHz; CIQC/CFCX Montreal,PQ 6005 kHz; CFCN/CFVP 6030 kHz; CFRB/CFRX Toronto,ON 6070 kHz; CKWX/CKFX 6080 kHz; and CHNS/CHNX 6130 kHz.

One station of note is CFRB's relay station CFRX. Through a wonderful agreement of convenience, all reception reports for CFRX are directed to the ODXA (P.O. Box 161, Station A, Willowdale, ON M2N 5S8), now the official issuer of QSL cards for the station. ODXA's address is announced twice an hour over CFRX, and the staff of CFRB/CFRX are relieved of the responsibility of processing the multitude of QSL requests for the station.

This is an excellent idea that should be copied by other clubs to promote goodwill between stations and DXers. Please send an IRC and a self-addressed envelope with each request for a CFRX QSL. Bravo, ODXA! and until next month, happy trails!

MT

RV-TVRO: Have Dish—Will Travel

One of the reasons you're reading *MT* is that you take your monitoring hobby seriously. As a scanner enthusiast or amateur radio operator, you wouldn't think of leaving your radios behind while you went on vacation. So, too, for the TVRO hobbyist.

Until recently, taking your satellite TV gear on the road was science fiction. But a number of things have changed over the last few years to help make your nightly rendezvous with the Clarke Belt a reality.

The Hardware Side

Two things had to happen regarding the technology of satellite broadcasting to allow reception on the road. First, better receiving equipment needed to be available in the form of smaller, more accurate parabolic reflectors and cooler operating Low Noise (Amplifier) Downconverters. In addition, higher powered satellites in both the C and Ku band frequencies needed to be in place.

Earlier versions of TVRO gear which included bulky 10 foot dishes and less sophisticated LNBs made transport impossible. And unless smaller dishes were used deep inside the continental U.S. footprint, reception was, at best, marginal. New higher powered satellites with more than twice the output power make it possible to leave the big 10 foot clunkers behind.

The Software Side

One of the things we like to take for granted in the realm of satellite dish installation is that, aside from the movement necessary in tracking the belt from West to East, the entire installation stays put. Imagine uprooting your system and carting it several hundred miles each day. The first thing you'll notice is that none of the satellites are where they are supposed to be.

Roughing it in the 90s. Winegard's Pinnacle RV Satellite System model RL-8453 installed atop a recreational vehicle.

That's because the original dish alignment was done on the basis of the dish's position on the planet relative to the satellites. That all changes the minute you move more than a few miles from the original set up site.

Happily, the world of microprocessing has saved the day and has made calculating the whereabouts of the Clarke belt in relation to the new position of the dish extremely easy. Most systems currently available have the necessary software which allows the user to simply enter the geographic coordinate of the current location of the system into a controller which automatically corrects the alignment.

Putting It All Together

It was bound to happen that enterprising companies would see the obvious connection between the size and cost of recreational vehicles (RVs) and a market for portable TVRO systems. The result is quite a number of systems available for portable use. They range from complete systems which include controllers and IRDs (Integrated Receiver Decoders) to dish and controller only; you provide the electronics.

Considerations

If you are interested in TVRO for the road, here are a few considerations: There is no substitute for the preprogrammed dish controllers and they aren't cheap.

Installing these systems on top of a travel trailer or motor home may not be a job for the weekend handyman. For safety's sake, leave the job to the professionals. This way, if anything goes wrong with the installation, someone else will have to fix it.

Remember that everything I've said about home reception is even more critical on the road. There's no substitute for dish surface accuracy and top-grade electronic components. In addition, these systems will have to endure the rigors of the road. They'll get bounced around in a way your home system will never know.

Finding Out More

Four systems are in wide distribution and are worth looking into for further information. A & E Systems, a division of the Dometic Corp., offers their six foot diameter "Travel-Sat" which can be raised, lowered and rotated with the touch of one button from inside the RV. One of their distributors is Northwest Video and Satellite,

Winegard one-piece 4.5 foot aluminum dish comes complete with infrared remote controlled satellite receiver/ positioner with built-in VideoCipher II Plus descrambler.

Inc., 12035 SE Stark Street, Portland, OR 97216 or call their toll free number 800-554-3773.

MotoSat makes an easily operated system with sophisticated software. Write for more information at 1805 East 3056 South, Wendell, ID 83355 or call toll free: 800-247-7486.

Polaris R.V. Satellite has recently entered the RV-TVRO market with their 6 foot C/KU mesh dish and their unique "polar over azimuth tracking mount." The unit folds face down and rises only 19 inches above the roof line when stowed. It requires a roof space of 72" x 84". For more on Polaris, write Polaris R.V. Satellite, 249 Rogue River Highway, Grants Pass, OR 97527 or call 503-479-8359.

And, finally, Winegard has introduced their Pinnacle RV Satellite System. The Pinnacle system model RL-8453 is a 4.5 foot perforated aluminum dish which retracts to 14.5 inches above the roof line and has a total roof weight of less than 90 pounds. But that's not all! This system also includes a satellite receiver with built-in VideoCipher II Plus descrambler, infrared remote control and even 35 feet of multi-use cable. Set up of this system is aided by an electronic compass and an internal database with 125 U.S. cities preprogrammed for automatic alignment. For more information, write Winegard at 3000 Kirkwood St., Burlington, IA 52601 or call 319-754-0600.

New Releases

MLE, Inc. has just released the 6th edition of the *World of Satellite TV* by Mark Long and Jeffrey Keating. With over 300 pages in its larger format, *World of Satellite TV* covers many technical aspects of TVRO including installation, system components and troubleshooting. Other chapters include international satellite reception; DBS: Satellite TV of the Future; Satellite Audio Services and much more. MLE, Inc. publishes many TVRO related titles including *The World Satellite Almanac* (See MT March 1992) as well as periodic titles which include *World Satellite Update Newsletter*. For more informa-

tion on MLE, Inc. publications, write for the 1991 World Satellite Catalog at P.O. Box 159, Winter Beach, FL 32971 or call 305-767-4687.

Tom Harrington, President of Universal Electronics, Inc. and author of *Hidden Signals on Satellite* and *World Press Services Frequencies* has announced the introduction of the SCPC-100 satellite audio receiver for reception of Single Channel Per Carrier channels via satellite. The unit features 56 channels of memory recall with one button, compatible with all 950-1450 MHz block downconversion systems and has a large LED tuning display. The SCPC-100 is set to retail for around $400. For more information write Universal Electronics, Inc., 4555 Groves Road, Suite 13C, Columbus, OH 43232 or call 614-866-4605. A complete review of the SCPC-100 will appear in the next issue of *MT* in this column.

TVRO News

• When and if PrimeStar ever gets off the ground, subscribers to the medium powered DBS service will have access to X*Press Information Services' X*Press X*Change and X*Press Executive.

• Showtime Networks will launch its new movie service called Flix in August. The channel will feature movies from the 60s to the 90s. Other new network hopefuls include Turners' Cartoon Network slated for October of this year, the ceaselessly touted Sci-Fi Channel in September, and the never present Cowboy Channel for which they've given up announcing a launch date.

• As this is being written, we are still weeks away from loading Galaxy 5 with the replacement programming lineup for Galaxy 6. However, tests on G5 channel 10 show a very solid signal with no interference from or to adjacent satellite Telstar 303 which is only 2 degrees away. The issue of the 3 vs. 2 degree spacing was dismissed earlier this year by the FCC in favor of the 2 degree spacing.

• In another FCC satellite-related move, the Commission found that zoning regulations restricting the installation of satellite dishes violates its 1986 preemption of such restrictions. Yet it doesn't want to become a legal clearinghouse for such cases. Help for beleaguered dish owners may be available from the American Satellite Television Alliance (ASTA). A recent California case involving a dish owner and a so-called Community Association was tried and found in favor of the dish owner. According to an article on the case in *The Transponder*, a TVRO trade journal, a Court of Appeal affirmed the trial court's decision and forced the Association to pay the court and attorney fees and slapped them for $3000 for "...filing a 'frivolous' appeal."

For information on the ASTA zoning package, write them at Suite 400, 16 Broadway, Valhalla, NY 10596 or call them at 914-997-8192.

• The Satellite Broadcasting and Communications Association (SBCA) has a committee which studies issues of zoning and restrictive covenants called the Zoning, Covenants, Conditions and Restrictions Committee (ZCC&R). The SBCA also offers a zoning package. Information on this and other SBCA issues may be had by writing them at 225 Reinekers Lane #600, Alexandria, VA 22314 or call them at 703-549-6990.

• And, finally, RAI/Europlus announced plans for its North and South American service. Beginning this summer, Europlus will launch on the new Intelsat-K satellite at 21.5 degrees west. All Europlus programming will be encrypted via D2Mac. Reception will be via 26" or 34" offset fed dishes and some programming in the 16:9 aspect ratio of 35mm film will be fed. This Atlantic "bridge" hopes to figure prominently in transmission of the Barcelona Olympic games.

Transponder Notes

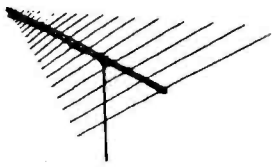
MainStreet TV (MSTV) is a Low Power TV network on Spacenet 2 (69 degrees W.) channel 7. It's serious competition for Channel America.

Arab Network of America (ANA) features live Arabic language news and various movies and television programs of interest to America's Arabic population. ANA is found on Satcom F2R channel 1.

New England Newschannel (NEN) is a regional news network for New England. It's a risky move at a time when the Monitor Channel has to bow out. NEN is found on Satcom F4, channel 3.

Followers of Independent Television Network (ITN) News have had to really look to find them since their former home, Westar 5, was retired. Currently, the ITN News (1:00 PM ET) is found on Galaxy 6 channel 24. MT

Ike Kerschner, N3IK



Antennas: Theory vs. Reality

Get a bunch of hams together and sooner or later the subject of antennas will come up! Everyone has a favorite antenna for some particular use. The problem is that two antenna installations are never identical in every way. So it easy to see that not everyone will get identical results with a given antenna.

A while back we discussed simple antennas. That particular column brought in quite a bit of mail. The one thing that was evident from the mail received here is that there is a lot of confusion and concern about antennas! I would like to take a little time to attempt to dispel some of the confusion.

What is evident to me is that too many amateurs are overly concerned with matching the antenna to the "Nth" degree. As I mentioned in my previous column; get a transmatch, learn to use it and stop worrying about the 3 to 1 mismatch you have with your particular antenna. **If the transmitter sees a low SWR, the antenna will work fine!** That's right, no matter what kind of antenna it is, it will work okay. To be sure, a low, short, indoor antenna will not work as well as a high, large, outside antenna on the same band; but it will work!

Normal Antennas

Many readers expressed concern over a normal antenna installation. By "normal," I mean the antenna is 40 or more feet high, in the clear and has an acceptable SWR. The concerns expressed were:

I have a dipole antenna on 80 or 40 meters and I am working more stations off the end than I am broadside.

If you read the normal literature on antennas, it will indicate that a dipole is directive broadside to the plane of the wire. This is true if the antenna is one wavelength or more above ground and totally in the clear. However, when talking about real-life, seldom is an antenna more than 50 to 70 feet high. At these heights the nice pattern the antenna book shows for the dipole does not exist! A dipole this close to the ground is for all practical purposes "omnidirectional." In some cases a nearby object can appear to cause a null in one direction or another: but clearly this cannot be helped and it is something we must live with.

My four element ten meter beam is 60 feet high, but does not seem to be directional. Often I can work stations to the side or rear of the beam with S9 signals and turning the antenna does not seem to make much difference.

Try to understand this about antennas, most antennas are **reciprocal**; that is, they hear as well as they transmit on a given signal. The gain we talk about on an antenna is gain at a given angle of radiation. That is, if the best take-off angle (vertical angle) for a given band is 15 degrees, then only radiation at that angle is plotted. (u-uh, you say, just what are you talking about?)

Okay, let's say that in order for your signal to be its best at a point halfway around the earth, your signal must leave your antenna at 15 degrees to the horizon. The antenna designer then calculates the antenna to have an optimum launch angle of 15 degrees, then plots the horizontal pattern at this angle. In most cases the higher angles will follow the pattern to a certain extent but will almost always be much broader. And in cases of extremely high angles the antenna may appear to be omnidirectional! Height above ground and surrounding objects again affect the true gain patterns of the antenna.

How Do We Get Antenna Gain?

To understand where antenna gain comes from we must first of all have something to measure the antenna against. Antenna designers measure gain against a standard called an Isotropic Source, which has a uniform gain of 0 in all directions. This is a theoretical source; it does not exist except in mathematics. Imagine if you can, that at a point somewhere in the universe a power source radiates equally in all directions. It should look like a ball and be perfect in shape; now we have an Isotropic Source.

When we cause this perfect ball to vary its shape we cannot change the power, all we can do is cause it to go in a different direction (similar to a balloon full of water). So if we pinch the sides of the source it would now appear to have more power in two directions and less in two directions, (perhaps corresponding to the theoretical shape of a dipole antenna). The directions that have more power would be called a positive gain direction and the sides showing the null would be a negative gain. In any event the gains still add up to 0!

As you can imagine, it is possible to change the shape of our source in many ways. And every time the shape is changed the gain of the source will vary in some direction, but the total gain will still be 0.

Understand, the source does not increase in power! But by manipulation we can cause the power to be repositioned to favor a particular requirement. Or to put it another way, we can cause the power to go in some desired direction and produce results that are superior or stronger in that desired direction.

I hope this explanation helps in understanding how gain is formed and what it is. To go further would require a lengthy mathematics discussion.

In Real Life

Most honest antenna manufacturers or designers will state the gain of a particular antenna in dBd or decibels over a dipole. A dipole has theoretically a gain of 1.2 over an isotropic source. Please bear in mind there are many factors that affect gain and antenna patterns and often we will not achieve the theoretical gain or pattern, but we can come close.

You must accept that a given antenna will often display characteristics that can be confusing but usually are explainable, and some of those characteristics may be downright annoying at times! For the most part a properly erected antenna will be worth the effort.

Disclaimer

The above discussion has been extremely simplified in an effort to enable the nontechnical person to understand a little more about how antennas work. There is much more to the story, and should you be interested in learning antenna theory in full detail, I suggest obtaining a copy of the ARRL *Antenna Handbook*.

QSL Info For The Former USSR

(The following is an excerpt from Rob Gerardi's column in the CIDX *Messenger*)

Here are the new QSL Bureau addresses for the Commonwealth of Independent States (The former USSR):

UA1A & UA1C	37 Lieutenant Schmidt Embankment, 199034 St. Petersburg, Russia
UA3A & UA3C	9/10 Prospekt Bernadskogo, 117311 Moscow, Russia.
UA	P.O. Box 88, Moscow, Russia
UB	27 Industrial St., 252056 Kiev, Ukraine
UC	48 Kazimitsd St., 220034 Minsk, Byelorus
UD	P.O. Box 165, 37000 Baku, Azerbaijan
UF	12 Borchorm St, 380044 Tbilsi, Georgia
UG	87 Prospekt Ordzhonikidze, 375007 Yerevan, Armenia
UH	P.O. Box 555, 744020 Ashkhabad, Turkmen
UI	86-A Khurshid Prospekt, 799917 Tashkent, Uzbek
UJ	10 Sport St., 734026 Dushanbe, Tadzhik
UL	105-A Rozybakiyev St., 380033 Alma-Ata, Kazakh
UM	1 Botanicheskiy Pereulok, 720052 Frunze, Kirghiz
UO	59 Bernadraststi St., 277014 Kishinev, Moldova

Rob Leonard's

Ham DX Tips

Are you enjoying the summer? It's a great time to think about trying a new antenna. And, to help you see how the new antenna is doing here are some DX tips...

BRAZIL PT7BI hosts the Brazil DX Net weekdays on 14240 kHz at 0900 UTC and Saturdays and Sundays on 28530 kHz starting 1700 UTC. ***BURKINA FASO*** XT2BW has been keeping DX alive on 30 meters by appearing on 10110 kHz CW at 2130 UTC daily. Send your QSL requests to his manager: WB2YQH Robert Nadolny, 135 Wetherstone Dr., West Seneca, NY 14224. ***CANADA*** On the 23rd of July at 1630 UTC, Canada's only museum devoted to amateur radio will offically open on the grounds of the Manitoba Agricultural Museum in Austin. The Museum will be open from 10 AM to 6 PM CDT daily 'til 1 October. In conjunction with the opening of the museum, special events station VE4MTR will be operated from the site starting at 1500 'til 2300 UTC daily 22 to 25 July using as many different modes (SSB, CW, RTTY, packet, SSTV) on as many different amateur bands as possible. Now, thanks to the Canadian International DX Club, SWL's all across North America will be able to keep up to date with the latest in DX tips about SWBC, utility, MW and other stations, as well as receiver modifications and inventions, antenna designs and other technical topics via the new CIDX SWL Discussion nets. At this time, Net Controller VE3FN, Richard Phillips, will host a net Saturdays at 2300 UTC on 3760 kHz and another on Sundays at 1730 UTC on 14165 kHz. ***INDIA*** VU2JJQ (Joe George Diana, Karungapalli, Kerala 690618, India) has been on 14195 kHz daily at 1200 UTC. ***IRELAND*** The worldwide Irish Net meets Sundays at 1700 UTC at 28730 kHz; if propagation is not favorable on that frequency, try either 21310 kHz or 14270 kHz. ***RUSSIAN REPUBLIC*** The First Annual Siberian Hamvention will take place 3 to 18 July on the Cruise Ship Anton Checkhov on the Yenisei River. Special Events stations (QSL to MBI Krasnoyarsk Brach, P.O. Box 1, Krasnoyark 640029, Russia) UA0A/MM and UB0B/MM will be operated from the ship during the convention. Look for one or both of these stations in the PAA DX net (a net made up of amateurs from the Confederation of Independent States) Sundays at 1500 UTC on 14315, 21315, and 28315 kHz. ***SINGAPORE*** 9V1YC has been on 21290 kHz starting at 1600 UTC. 9V1YC is James A Brooks, Box 1265, Singapore 9117. ***SOUTH ORKNEY ISLANDS*** VP8CFM has been on 21090 kHz at 1800 UTC and 14090 kHz at 2100 UTC operating RTTY. Look for him operating SSB on 21215 kHz at 1930 UTC. His QSL manager is GM4KLO, Michael Mistofsky, 25 Broomcroft Rd., Glasgow G77 5ER, Scotland. ***SPAIN*** Several special event stations will be operating from Barcelona and the other sites during the Summer Olympic Games. All stations will be operating on 10, 15, 20, 40, 80 and 160 meters SSB, CW, RTTY, SSTV and packet. The stations and the locations they will be operating from are: EH92A (Banyoles), EH92B (Barcelona), H92C (Catelldefels), EH92D (Badalona), H92G (Granollers), EH92H (L'Hospitalet de Lloragat), EH921 (Viladecang), EH92L (Sabadell), H92M (Mollet), EH92N (Valencia), EH92R (Reus), EH92S (Sant Sad Urni D'Anoia), EH92 (Terrassa), EH92U (Seu D'urgell), EH92V (Vic), EH92Z (Zaragoza). ***TANZANIA*** The Royal Omani Amateur Radio society hopes to put stations 5HOROA (from Pemba Island) 16 to 31 July and 5HORDA/A 21 to 27 July from Zanzibar Island all bands and modes. 5H3AS (whose QSL manager is Jan Helge Jackobsen, Sandvikslien 16, N-5035 Sandviken, Norway) is a RTTY regular on 21084 kHz at 1400 UTC daily. ***THAILAND*** HS0ZAA has been on 21090 kHz RTTY between 1300 and 1500 UTC daily. QSL to his manager Michael J Castellano, 64 Great Hill Rd., Guilford, CT 06437. ***USA*** A special net for ham operators 80 years of age and over, known as the "Octogenarian Net," meets every Tuesday on 7230 kHz SSB at 1800 UTC and 2000 UTC on 14026 CW. For more information about how to join this group either join them on the air or write NT3S, Jon Ness, 45 Marion Terrrace, Easton, MD 21601. If you are looking for any type of used amateur or SWL equipment, books, etc. you might want to check "The Trader's Net" which meets on 7275 kHz Sundays at 1400 UTC. Net control stations are N4BOR and WB4NHU, and amateurs from OH to FL, from TX to SC join the net, announce what equipment they want to either buy, trade or sell, and (this is important for SWL's) their phone numbers so that you can call and talk about price, shipping, condition, etc. N9HGF starts "The Old Gear Net" on 7275 kHz immediately after the "Trader's Net." Operating on the same frequency, this net operates exactly the same but concerns itself with much older equipment--a good place to obtain schematics for a 20 to 30 year old radio.

Have a happy Canada Day or Fourth of July and a good summer; or a mild winter for those of you in the Southern Hemisphere. 73 de Rob

UP	15 Basanavichaus St., 232009 Vilnius, Lithuania
UQ	P.O. Box 164, 226098, Riga-Center, Latvia
UR	P.O. Box 125, 200125 Tallinn, Estonia.

This list comes from N6VR via ARZ DX. If you choose to use these bureaus, remember to send only cards starting with the listed prefixes to the proper one. These bureaus do not handle all cards for their countries! So don't send ES prefix cards to the UR Bureau, Okay?

One last thing,

Many of you have been addressing mail to me via my *Call Book* address. Since I have moved three times in recent months, mail is taking a long time to reach me and in some cases is being lost. Please address all correspondence to me c/o Monitoring Times, P.O. Box 98, Brasstown, NC 28902.

Want to see a pix of your shack in *MT*? Send photos of you and your shack to me, and each one that is published will receive a prize.

That's all gang, see ya in August. 73 de Ike, N3IK

MT

George Zeller
P.O. Box 98
Brasstown, NC 28902-0098

"Ex-Prisoner" Clandestine Fined

The Federal Communications Commission has issued an $8,000 Notice of Apparent Liability to Robert Pisano of Tampa, Florida. Sources in the FCC confirm that Pisano is the alleged operator of anti-Castro clandestine station **La Voz de la Federacion Mundial de Ex-Presos Politicos Cubanos.** The Monetary Forfeiture notice was issued for a 7080.8 kHz broadcast of this station from Tampa on November 18, 1991.

According to the FCC, Pisano used his own name over the air during broadcasts, and claims to have spent 18 years in a Cuban prison. The FCC says that it "became aware of the operation of an unlicensed station through a publication for shortwave listeners." (!!!)

On the same day that the Commission voted to levy the fine against Pisano, they also voted to issue a $10,000 Notice of Apparent Liability to Donald W. Bishop of Overland Park, Kansas. As *MT* reported in November 1991, the FCC alleges that Bishop was responsible for a widely heard marathon mobile relay of several old **Voice of Laryngitis** tapes last October. Genghis Huxley, longtime owner and operator of Laryngitis, has denied any responsibility for this incident.

As reported in this column last month, Ex-Presos made numerous transmissions in the 41 meter pirate band *after* the November 18 bust, but *before* the FCC issued the fine notice. In contrast, DX-ers' loggings establish that the Laryngitis rebroadcast incident took place during only one 24 hour period last fall. Despite these facts, the FCC saw fit to give Pisano a $2,000 relative discount in his fine. Hmmm.

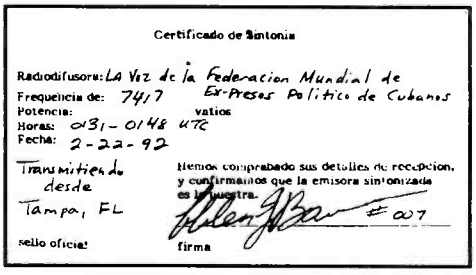
The Wellsville maildrop (see address below) has announced that it will forward reception reports to Ex-Presos if **four** 29cts mint stamps are enclosed. Prepared QSL cards should be furnished with your report.

Patria Libre and Bougainville

Numerous DXers have noted the ELN's anti-Colombian **Radio Patria Libre** on its new 19 meter frequency that we reported last month. Mark Seiden of Miami, Florida, Mike Hardester of Jacksonville, North Carolina, and many others have been hearing them nightly on 15045 kHz (+/- 5 kHz) between about 0030-0115 UTC.

This one generally has put a strong signal into eastern North America. *PopComm* columnist Harry Helms of San Diego, California writes in to report weaker but clearly audible signals on the west coast, leading Harry to suspect that the station's transmitter may still be within (or very near) Colombia.

This raises a curious point. Why is Patria Libre using 19 meters? If its transmitter is in or near northwestern South America, its signal would certainly skip right over Colombia at this time of day on 15 MHz. It's a puzzle.



Certificado de Sintonia

Radiodifusora: La Voz de la Federacion Mundial de Ex-Presos Politico de Cubanos
Frequencia de: 7417 kHz
Potencia: watios
Horas: 0131 - 0148 UTC
Fecha: 2-22-92

Transmitiendo desde Tampa, FL

Hemos comprobado sus detalles de recepcion, y confirmamos que la emisora sintonizada es la nuestra.

#007

sello oficial

firma

The Ex-Presos QSL confirms a Tampa site.

From the other side of the world, some North American DXers now report logs (with difficulty) of **Radio Free Bougainville** on 3880 kHz around local sunrise. Scott Edwards of Los Alamitos, California, sends in a letter from Sam Voron, the main figure behind this station. Voron says that the station has broken a communications blockade against Bougainville by Papua New Guinea. He also claims a schedule of 0800-1100 UTC.

Scott's reception report to Box 1203, Honaira, Solomon Islands, generated an address for the Bougainville Interim Government at Box 120, Arawa, Republic of Bougainville. But, Scott finds that reports to either address are simply being forwarded to Sam Voron, Australia Amateur Radio Network, 2 Griffith Avenue, Roseville, NSW, Australia 2069. Scott also notes (via a Radio New Zealand International newscast) that a Solomon Islands Broadcasting Corporation newscaster was fired for reporting items about Bougainville without editorial clearance. Thanks for the great info, Scott!

Iran's Flag of Freedom

We have two logs of **Iran's Flag of Freedom** this month. Dave Gasque of Orangeburg, South Carolina, noted a brief English ID on 9250 kHz at their 0328 UTC sign-on. The subsequent program is in Farsi. Mark Seiden pulled this one in on parallel frequencies of 11470 and 15565 kHz at 0405.

DXers have strongly presumed for years that the United States CIA is associated with this operation. Scott Edwards points out that the station offers a taped telephone message in Farsi at (818) 792-4726. This dial-a-clandestine number is a local call in Los Angeles!

Seiden also tentatively heard **La Voz del Sahara Libre** on 15215 kHz at 0140 with a partial "La Voz" identification. "Play DX" #686 reported this clandestine as active here, supposedly via an RTV Algerienne relay. Mark unfortunately noted the signal well underneath powerful Arabic language SWBC interference.

Bush's Secret NSD

In an interesting January 14, 1992, report, the US General Accounting Office revealed that President George Bush has issued a secret order that impacts international broadcasting by the United States. Citing a September 9, 1991, report from the Congressional Research Service, the GAO says that Bush and the National Security Council issued National Security Directive number 51 in the fall of 1990. This still-classified directive "established two study groups to determine international broadcasting policy and consider the restructuring of U. S. government broadcasting organizations."

Of course, *MT* has been unable to obtain a copy of this secret National Security Directive. But, it raises highly interesting questions. Does Bush secretly intend to restructure the VOA and RFE/RL? Might covertly funded clandestine broadcasting stations have been part of this secret directive from the President? The GAO report obviously raises more questions than it answers. So far our government won't answer them.

Arizonapirate and Europirate

Thanks go to Michael Lenane of Mesa, Arizona, for an interesting clipping about **KAPW** from the March 19 *Arizona Republic* newspaper. Bill Dougan operates this low power FM pirate on 88.9 MHz from his trailer in northern Phoenix. The KAPW schedule is nominally 0100-0500 UTC, daily except local Saturdays. It features an eclectic programming mix of left and right wing talk shows, taped books, documentaries, classical music, and Native American music.

Stephen Tsuya, engineer in charge of the Douglas, Arizona, FCC office, allegedly has threatened to fine KAPW unless it ceases transmissions. In response, Dougan vows legal action and continued broadcasting activity.

Let me sneak in one of my own logs from Europe, not Arizona. Under good conditions I have been hearing the new Irish pirate **DLR-106** on 6220.8 kHz in the 0200-0600 UTC period. This one usually relays a licensed Irish FM station, but sometimes it inserts its own commentary. QSL's are already forthcoming for the unlicensed shortwave relay via a simple address of DLR-106-FM, Dun Laoghaire, Co. Dublin, Ireland.

Glenn Waber of Wisconsin bagged this Radio EXP QSL.

Numbers Logs, Anyone?

As you read in the "Ask Bob" column of the May *MT*, many have speculated that the end of the cold war and the startling political changes in the former USSR and Eastern Europe could lead to the disappearance of **Numbers Stations.** But, Simon Mason of England cited plenty of European numbers logs in the "Outer Limits" last month. Robert Stone of Schodack Landing, New York says that he regularly hears a Spanish numbers station on 7422.5 kHz around 0400. I also hear this one, as well as a diverse variety of strange numbers broadcasts on 6840 kHz just about daily. What have YOU been hearing? Let us know.

Recent Pirate Activity

An absolute blizzard of North American pirate activity continues on shortwave. We are continuing an experiment that began in last month's *MT*. Readers have asked for a semi-loggings summary of recently active pirates. What do you think about this approach? Let me know!

Maildrop addresses this month for correspondence and reception reports to pirate stations include PO Box 452, Wellsville, New York 14895; PO Box 109, Blue Ridge Summit, Pennsylvania 17214; PO Box 40554, Washington, DC 20016; PO Box 17354, Atlanta, Georgia 30316; and PO Box 293, Merlin, Ontario NOP 1WO. Norm Alexander says that he heard a rumor on a recent DX program that the Wellsville address has closed, but *MT* definitely confirms that this rumor is false.

What We Are Hearing

CSIC- 7415 kHz at 2030. Canadian Pirate Rambo with a rock and comedy format and a "Voice of the Great White North" slogan. Uses "Psycho Chicken" as an interval signal. Addr: Blue Ridge Summit. (Peter Stawicki, Norman, OK)

Hello Radio- 7413 kHz at 0300. Formerly an unpopular pirate jammer, the station's announcer now just shouts HELLOOOO RADIOOOO from time to time. Addr: None. (Alan Masyga, Winona, MN)

Jolly Roger International- 7415 kHz at 0400. An extremely well produced mix of rock and amusing comedy; not to be confused with a Europirate using the same ID. Addr: None, but reads reports left on the ANARC computer BBS at (913) 345-1978. (Norm Alexander, Diamond Springs, CA)

KMCR, Magic Carpet Radio 7425 kHz at 0315. Has a rock music format with unusually hi-fi AM modulation. Addr: Blue Ridge Summit. (Alexander)

KXKVI- 7415 kHz at 0430. A rock and new age music station with highly professional "Interplanetary Radio" jingles. Addr: None, but verifies log reports in club bulletins. (Paul Friend, New York, NY)

Midnite Radio- 7415 kHz at 0230. One of the few pirates with a talk show format, most recently with criticism of organized religion. They announce a telephone number of (214) 888-1551. Kurt's first pirate! (Kurt Meyer, Madison, WI and Bill Hennessey, Marble Falls, TX)

Radio Anarchy- 7419 kHz at 0245. A different station from the **Voice of Anarchy** discussed last month, featuring punk rock from the west coast and a low power transmitter. They say that they are an "enemy of the state." Addr: Blue Ridge Summit. (Skip Harwood, Beale AFB, CA)

Radio Beaver- 7417 kHz at 2315. Announcer Bucky Beaver programs a mix of Canadian rock, Canadian comedy, and pirate commentary. Addr: Merlin. (Darrell Pierce, Campbellsville, KY)

Radio Clandestine- 7435 kHz at 2200. R. F. Burns, North America's longest running pirate for over two decades, has returned with his tightly produced mix of rock and comedy. Addr: None, former addresses currently defunct. (Russ Hill, Warren, MI)

Radio EXP- 7416 kHz at 0430. A rock station that is Robert's first pirate! Addr: Wellsville. (Robert Stone, Schodack Landing, NY)

RBCN- 7415 kHz at 0330. Radio Bob returns with another hilarious mix of country music and regional southern humor. Addr: Atlanta. (Elmer Cronkright, Wyoming, MI)

RFM- 15052 kHz at 2215. Uses a format of jazz instrumental music and low key comedy by announcer H. V. Short. Addr: Blue Ridge Summit. (Randy Kaeding, Stevensville, MI)

Voice of the Night- 7415 kHz at various times. Lad's "baby pirate" format of rock and comedy is still frequently with us, but not daily as was observed during late winter and early spring. Addr: Wellsville. (Hardester and many other DXers)

WARI- 7415 kHz at 0100. EX-WGNK, Dr. Lobotomy programs mainly rock music. Addr: Wellsville. (Hardester and direct from the station)

WBNY- 7416 kHz at 0000. Commander Bunny with a hilarious clandestine parody from the People's Committee in Solidarity with Rodent Freedom Fighters. Their traditional holiday show aired "before" Easter this year. Addr: Washington. (Pat Murphy, Chesapeake, VA, whose WBNY QSL is his 100th pirate verie. Congratulations!)

WCYC- 7415 kHz at 0345. Neil Stanley and Mr. Lee, the "World's Craziest Young Children," feature rock and old TV show themes. Addr: Merlin. (Seiden)

WEED- 7415 kHz at 0500. A new station with rock music and drug humor, supposedly from the southwestern USA. Addr: None, uselessly solicits reports via radio DX programs. (Edward Rausch, Cedar Grove, NJ)

WORK- 7420 kHz at 0115. Station announcer Workingman hosts a clever labor-management parody station, with all sketches and music about work. Addr: Wellsville. (Joseph Leach, Dayton, OH)

WSKY- 7415 kHz at 0400. A slick rock format with mailbag segments from Mike Richards and Doug Barley. Addr: Wellsville. (Robert Thomas, Bridgeport, CT)

MT

SEE MORSE, RTTY, FAX AND TOR LIKE YOU'VE NEVER SEEN THEM BEFORE!

The M-8000
MULTIMODE DECODER

Now with VGA

ONLY $129&95!*

VGA, the top-of-the-line in personal computer graphics, now blazes into the amateur radio market in the all-new Universal M-8000. With stunning color, lightning character display and dazzling features, the M-8000 puts professional quality into your communications position. More than just a pretty picture, the M-8000 offers both old and new decoding modes including: RTTY, packet, ASCII, FDM, FEC-TOR, ARQ-TOR, Morse, WEFAX, and Piccolo. And because of its built in microprocessor, no PC is necessary.

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ORDER: DEM6

Accessories:

KIT01 - 19" Rack Panel Mounting Kit - $19.95

**** Plus $20 UPS Shipping***

Realistic Business Band Transceiver!

ONLY $149.95*

Realistic has now come out with a highly competitive "walkie-talkie" sporting such features as: one-watt operating power (switchable to .5 watts for low power), a 6" flex whip with a BNC connector, removable battery pack, a stainless steel belt clip, a soft vinyl carrying case, AC wall charger and a red LED transmit light that turns yellow when the battery gets low and green when a signal is received. The BTX-120 also includes crystals for itinerant 151.625 MHz, along with an FCC license application. There is no test required for this license.

Sensitivity of the new Handie-Talkie is .5 microvolts for 12 dB SINAD. Audio output to the speaker is 350 milliwatts--strong and clear, even in noisy locations. Adjacent channel rejection (15 kHz) is attenuated by 50 dB.

The BTX-120 has top-panel jacks for both earphone and microphone plugs. Optional is the Realistic 19-310 speaker/microphone. You can expect several hours of normal operation off one charge of the battery. The radio measures 2-1/2" x 1-1/2" x 6" and weighs 17 ounces.

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* Plus $6 Shipping

INTERNATIONAL CALLSIGN HANDBOOK

After years of collecting and verifying tactical callsigns, Gayle Van Horn has finally published the most exhaustive list of tactical callsigns and their identifications ever assembled for shortwave and scanner listeners. Now you, the radio listener, can get this massive, 250 page directory!

You will now know what all those codes from the US Air Force, Navy, Army, Customs, Secret Service, Marine Corps, and foreign military actually are! Internationally registered callsigns and their users around the world are listed as well, with comprehensive entries from coastal maritime stations, embassies, merchant marine, aviation, NASA, US and foreign military, Interpol, MARS, and many more!

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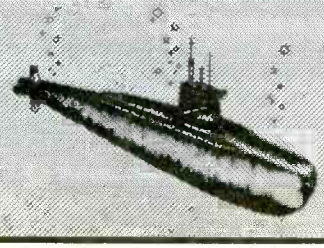


Books will ship on July 31, 1992
Payment will not be processed until shipment.

*Plus $4 UPS Shipping

Jack Albert

Playing With The Piccolo

Universal Radio introduced the M8000 at Dayton in April and already there has been controversy over the legality of a mode that allows the monitoring of digital pagers.

After consulting Bob Grove by "land line" he assured me that it's not illegal to monitor digital pagers. Remember, however, that the same FCC rules apply; that is, you cannot divulge the contents or substance of the messages you receive. Nonetheless, I'm glad that Universal SW and Infotech are keeping up the tradition by providing us with state-of-the-art equipment.

The M8000 includes Piccolo!

Remember when my good friend Dr. Dave Wilson copied Piccolo by hand deciphering numbers that represented tones? I built a decoder that interfaced to a PC and wrote software that converted the Piccolo tones into numbers. He and I met at the Dayton Hamfest in April 1990 and I placed in his hands a box that contained the decoder, a computer disk and some tools. A few months later, he actually copied text in the clear and logged about 30 frequencies. We were the first hobbyists to copy Piccolo in the U.S.

Now, two years later, Infotech, by using some of this groundwork, has been able to include Piccolo in the M8000! But they aren't the first. About a year ago Hoka (a company in Holland) introduced the Code 3 decoding software. An ad for the Code 3 appears on page 105 in the March issue of *MT*. It was the first package to include Piccolo as a $135.00 option. Coquelet, another mode we discovered in the summer of 1990, is also available for $135.00.

The basic Code 3 package includes Baudot, ASCII, ARQ*, Twinplex*, TDM, FEC*, SITOR, a new mode called TORG10 and 11, and FAX for $785. Hoka also sends upgrades whenever new modes are discovered.

I haven't see one of the decoders myself, but I did talk to a reader that owns one. At the time he wasn't able to copy any piccolo and he wasn't that impressed with the signal performance of other modes. That was about a year ago. By now I'm sure that Hoka has the bugs worked out.

For more information on the Code 3 call the U.S. distributor: Stone Mountain Engineering Co., 404-897-5756, Box 1573, Stone Mountain, GA.

For the M8000, see "What's New?" or call Universal Radio at (800) 431-3939.

Crossed Signals

• In the May issue, I gave an example of some traffic that was copied on 13,366.5 kHz 5YD from Nairobi Air Kenya. I stated that some of the messages contained the letters INTERPOL (they

were too garbled to print). I did not mean to imply it was an INTERPOL example.

I did receive E-mail from Richard Crisp who said that you can copy INTERPOL on 18,755.8 kHz (JPA24) using sitor mode B. I haven't had much luck copying it here in the Mid-West. Can you do better?

• Also in the May issue I mentioned being able to reduce the computer interference while copying RTTY using a Sony 2010 with a laptop computer and the Hamcom software. I said that I used a Radio Shack #273-104 toroid choke. Let me amend that to #273-105.

The "dash 104" is okay for high frequencies and may help you with scanner interference problems, but the "dash 105" is much longer and has a higher material density which increases the inductance. It works much better at lower frequencies. Its only problem is a small inside diameter which makes it difficult to pass more than one turn of computer cable through it.

• Two contributors have sent in FAX photos: propagation columnist Jacques d'Avignon in Canada, using 60 lpm (he didn't provide the frequency) and Clifford A. Nadiger of Copperas Cove, TX, who copied 13,508 kHz using 120 lpm, IOC 576, L-R POS. Speaking of FAX, I was told that Hamcom will soon have the FAX mode available.

• Several readers have asked, "Why don't you print a frequency list in your column?" The answer is simple; readers rarely send in their loggings! Send 'em and I'll print 'em. Meantime, if you want a frequency list, tune in to WLO on 4.460. An example of what you can copy is shown at right!

NNN

SHIP TELEX SERVICES
WLO RADIO

MOBILE MARINE RADIO, INC
TELEX: 50 5444 (KEY CTRL G TO GET OPR)
HOURS OF SERVICE.....: HH 24 CONTINUOUS
FEC RADIO TFC LISTS/WX: HH PLUS 35 (ON TSB FREQUENCIES)
TSB FREQUENCIES:
1991 HURRICANE SEASON THRU 11/30/91
4462.5 6344.0 8534.0 12992.0 16997.6 22688.0 KHZ
NON-HURRICANE SEASON 12/ 1/91 547 05/31/92
4343.0 6416.0 8514.0 12886.5 17022.5 22487.0 KHZ
WLO FULL INFO BROADCASTS FEC TSB FREQUENCIES DAILY AT 0235 0835 2035 UTC AFTER FEC TRAFFIC LIST.
WLO FULL TIME NBDP ARQ CENTER FREQUENCY LISTINGS

ITU CHAN	SHIP TRANSMIT	RECEIVE	REMARKS
405	4174.5	4212.5	DELETE
406	4175.0	4213.0	
410	4177.0	4215.0	
411	——	——	WARC-87 MOVED TO ITU CH. 415.
415	4179.5	4217.0	NEW FULLTIME ARQ - PLEASE ADD TO WLO.
417	4180.5	4218.0	NEW FULLTIME ARQ - PLEASE ADD TO WLO.
606	6265.5	6317.0	
610	6267.5	6319.0	
611	——	——	WARC-87 MOVED TO ITU CH. 624.
615	6270.0	6321.0	
619	6272.0	6323.0	
624	6274.5	6325.5	NEW FULLTIME ARQ - PLEASE ADD TO WLO.
805	8378.5	8418.5	DELETE. WLO MOVED TO ITU CH. 829.
806	8379.0	8419.0	
810	8381.0	8421.0	
811	8381.5	8421.5	DELETE. WLO MOVED TO ITU CH. 832.
815	8383.5	8423.5	
826	8389.0	8429.0	
829	8390.5	8430	NEW FULLTIME ARQ - PLEASE ADD TO WLO.
832	8392.0	8432.0	NEW FULLTIME ARQ - PLEASE ADD TO WLO.
1205	12479.0	12581.5	
1211	12482.0	12584.5	
1215	12484.0	12586.5	
1225	12489.0	12591.5	
1229	12491.0	12593.5	
1234	12493.5	12596.0	
1240	12496.5	12599.0	
1250	12581.5	12684.0	DELETE. WLO MOVED TO ITU CH. 1261.
1251	12502.0	12604.5	
1254	12503.5	12606.0	
1261	12507.0	12609.5	NEW FULLTIME ARQ - PLEASE ADD TOWLO
1605	16685.5	16 09.0	
1611	16688.5	16812.0	
1615	16690.5	16814.0	
1625	16695.5	16818.5	
1629	16697.5	16820.5	
1640	16703.0	16826.0	
1644	16705.0	16828	NEW FULLTIME ARQ BEAM TROP N ATLANTIC
1650	16708.0	16831.0	
1654	16710	16833.0	
1661	16713.5	6836.5	NEW FULLTIME ARQ BEAM NORTH ATLANTIC
2210	22289.0	22381.0	
2215	22291.5	2 83.5	
2254	22311.0	22403.0	
2256	22312.0	22404.0	
2260	22314.0	22406.0	
2262	22315.0	22407.0	
2272	22 20.0	22412.0	=
2264	22326.0	22418.0	=
2510	25177.5	26105.5	NEW FULLTIME ARQ = UNDER CONSTRUCTION

TIME SLOT BROADCASTS (TSB)

MORSE CODE 25 WPM CW MODE - TOT UTC	PRODUCT	NON-PAIRED NBDP FEC MODE - TOT UTC
0000 0600 1200 1800 QTC	N ATL HIGH SEAS	0035 635 1235 1835
—— —— —— ——	N ATL TWD FEC ONLY	
0100 0700 1300 1900 QTC	N PAC HIGH SEAS	0135 0735 1335 1935
—— —— —— ——	N PAC TWD FEC ONLY	
0200 0800 —— 2000 QTC	WLO FULL INFO	0235 0835 —— 2035
—— —— 1400 —— QTC	RPT GOM/CAR SEA	—— —— 1435 ——
0300 0900 1500 2100 QTC	W CENT N ATL	0335 0935 1535 2135
0400 1000 1600 2200 QTC	GULF OF MEXICO	0435 1035 1635 2235
—— —— —— ——	GULF LOOP FEC ONLY	
0500 1100 1700 2300 QTC	CARIBBEAN SEA	0535 1135 1735 2335

* = Several variations are included with this mode.

"Fasten your seat belts...it's gonna be a bumpy ride."

Sound familar? It will if you're a classic movie fan like me. That phrase also reminds me of QSLing—a bumpy ride and usually unpredictable.

Gigi Lytle of Lubbock, Texas, understands this aspect of QSLing. She writes in response to a "Letter to the Editor" (May issue) "We all get 'antsy' when we don't receive a QSL from a particular station; and we all probably think periodically 'Hummm, haven't had any response from any stations I've written to in Riverland, guess I won't bother wasting my time or postage writing any more letters or reports down that way.' And then, a couple of days later in the mail is a beautiful QSL from some remote area of the world to whom you merely mailed a post card, no return postage, no IRC or anything, and you feel really rotten."

"If I am pleased by what I hear on a particular station, I should write and let them know—conversely, if I think what I heard is really poor, I should also write and let them know."

Just to keep the controversy going, let me add that James Tobola of West, Texas, says he hasn't QSLed a station in nine years; he just likes to listen. He wonders, "How many SWLers never QSL a station? Do they outnumber the QSLers?"

Absolutely. For which the stations are grateful. Dr. Paul Freed of Trans World Radio said in a letter to our editor, "It is advantageous for us that listeners to all of our language broadcasts aren't as enthusiastic DXers as our English-speaking audience, or we'd be swamped with requests!"

DJIBOUTI

FUV-Station Radionavale Francaise, 13042.5 kHz. Full data letter, verified by Le Maitre Prinicipal Dawidowicz-Adjoint Transmissions. Received in 18 days for a Utility report and one IRC. Station address: Marine en Mer Rouge et Golfe D'Aden, Chef du Service T.V.L. Djibouti, La Station Radioelectrique de la Marine a Djibouti. (Nagl Martin, Austrian DX Club)

JAPAN

Radio Japan, 5960 kHz. Full data scenery QSL card, verified by K. Hishikawa. Program schedule and Radio Japan newsletter included. Received in 55 days for an English report. Station address: Tokyo, 150-01 Japan. (Michael J. Mc Ferrin, Smiths Creek, MI)

LEBANON

Wings of Hope, 11530 kHz. Full data color world map card, verified by Mark Christian. Received in 40 days for an English report and 1 IRC. Station address: P.O. Box 3379, Limassol, Cyprus. (QSL mailed from Israel) (Nicholas P. Adams, Newark, NJ)

NETHERLANDS ANTILLES

Deutsche Welle-Antigua Relay, 6040 kHz. No data QSL map card, with preprinted signature of Peter Senger. Received in 33 days for an English report. Station address: North American Service, P.O. Box 10 04 44, W-5000 Cologne 1, Germany. (Adams, NJ)

PERU

Radio Union, 6115 kHz. Full data station logo/scenery card, verified with illegible signature. Received in one month for a Spanish report, and souvenir post card. Station address: c/o Miguel Palacios Rodriquez, Av. Abancay 377-4to piso, Apartado 6205, Lima 1, Peru. (Tom Risher, Whittier, CA)

RUSSIA

Radio Moscow, 6000/5905/9600 kHz. Three full data scenery cards for each frequency, with no veri signers. Report forms included. Received in 65 days for English reports and two IRCs, and a souvenir postcard. Station address: Pyatnitskaya Ulitsa 25, Moscow, Russia. (Gene Aker, Palm Springs, CA)

SAIPAN

KFBS Far East Broadcasting Co., 12025 kHz. Full data transmitter site card, without veri signer. Station info sheet included. Received via surface mail in 573 days for an English report in 1990. Station address: P.O. Box 290, Saipan, MP 96950 USA. (Mike Hardester, Jacksonville, NC)

SOUTH KOREA

Radio Korea, 9750 kHz. Full data color Korean Dancers card, without a veri signer. Station souvenir and program schedule included. Received in 22 days for an English report. Station address: 18, Yoido-dong, Youngdungpo-ku, Seoul 150-790 Korea. (Robin Verhose, Spring Lake Hts., NJ)

UNITED STATES

Virginia Beach Visitor Info Center, 1620 kHz-AM. Full data QSL letter, verified by Buddy Wheeler-Supervisor. Received in 41 days for an English report. Station address: City of Virginia Beach, Dept. of Convention & Visitor Development, P.O. Box 200, Virginia Beach, VA. 23458 (David A. Gasque, Orangeburg, SC)

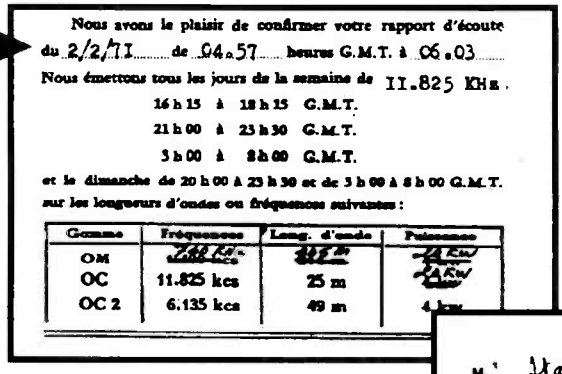
Honolulu Radio, 13282 kHz. Full data station letter, signed by Station Manager. Received in 34 days for an English Utility report, and return postage. Station address: Honolulu Flight Service Station, 4204 Diamond Head Rd., Honolulu, HI 96816. (Stanley Klemanowicz, Torrance, CA)

Stanley Mayo of Winslow, ME, sent in these two QSLs from Radio Tahiti. Stanley apparently has enjoyed the shortwave hobby for many years; the QSLS are ***twenty years apart!***

Do you have special QSLs, pennants or logos from radio stations? Send them to us and we'll use them as space permits. We'll copy them and return the originals to you within the month.

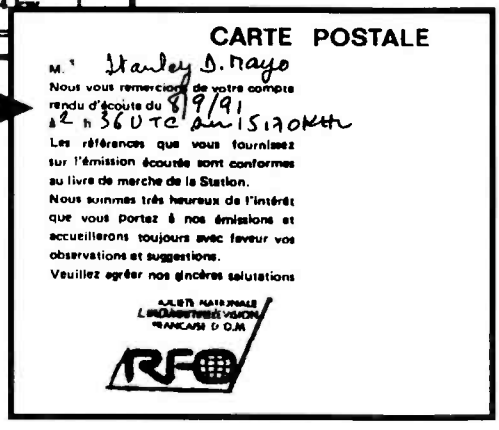
Send them to:

QSLs
c/o Monitoring Times
P.O. Box 98
Brasstown, NC 28902-0098



Nous avons le plaisir de confirmer votre rapport d'écoute
du 2/2/71 de 04.57 heures G.M.T. à 06.03
Nous émettons tous les jours de la semaine de 11.825 KHz.
16 h 15 à 18 h 15 G.M.T.
21 h 00 à 23 h 30 G.M.T.
5 h 00 à 8 h 00 G.M.T.
et le dimanche de 20 h 00 à 23 h 30 et de 5 h 00 à 8 h 00 G.M.T.
sur les longueurs d'ondes ou fréquences suivantes :

Gamme	Fréquences	Long. d'onde	Puissance
OM	[illegible]	[illegible]	[illegible]
OC	11.825 kcs	25 m	[illegible]
OC 2	6.135 kcs	49 m	[illegible]



CARTE POSTALE

M. Stanley S. Mayo
Nous vous remercions de votre compte rendu d'écoute du 8/9/91
à 2 h 36 UTC sur 15.170 KHz
Les références que vous fournissez sur l'émission écoutée sont conformes au livre de marche de la Station.
Nous sommes très heureux de l'intérêt que vous portez à nos émissions et accueillerons toujours avec faveur vos observations et suggestions.
Veuillez agréer nos sincères salutations

RFO

How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Daylight Time) 4,5,6, or 7 hours for Eastern, Central, Mountain, or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC: for example, the BBC's "Ken Bruce Show" (0030 UTC Sunday) will be heard on Saturday evening (8:30 PM Eastern, 5:30 PM Pacific) in North America, not on Sunday.

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours. If it's news you're interested in, check out the complete "Newsline" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a re-run, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday
M: Monday
T: Tuesday
W: Wednesday
H: THursday
F: Friday
A: SAturday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page All frequencies are in kHz..

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

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

Of course, every station can't be heard all the time. To help you find the right frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am:	The Americas	me:	Middle East
na:	North America	as:	Asia
ca:	Central America	au:	Australia
sa:	South America	pa:	Pacific
eu:	Europe	va:	various
af:	Africa	do:	domestic broadcast
me:	Middle East	om:	omnidirectional

Consult the propagation charts. To help you further find the right frequency, we've included propagation charts at the back of this section, which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

The BBC's Harry Peart, Mike Costello, Linda Spurr and David Coles are in Barcelona bringing you the latest results and stories in special editions of *Sports Roundup* and *Olympic Sportsworld* (see below)

Sports Roundup: Daily 0315, 0945, 1245 (ex Suns); 1745, 2245
Olympic Sportsworld: Daily July 25 to August 9: 2009-2030
Sportsworld: Sats July 25, Aug. 1, 8: 1401-1700
Suns July 26, Aug. 2, 9: 1515-1600

English language **shortwave guide**

MT Monitoring Team

P.O. Box 98, Brasstown, NC 28902-0098

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919-661-0095

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Ontario, Canada

Kannon Shanmugam
Program Manager
Kansas

John Carson
Oklahoma

Jim Frimmel
Texas

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
Croatian Radio, Zagreb [M-A]
Radio Australia
Radio Beijing
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 Ukraine
SBC Radio 1, Singapore
Spanish Foreign Radio
Swiss Radio Int'l
Voice of America
WWCR (Program Two) [T-A]
WWCR [T-A]
0005
Radio Pyongyang
0010
Radio Beijing*
0030
All India Radio
Christian Science Monitor (Asia) [M]
Christian Science Monitor [T-F]
HCJB
Radio Havana Cuba [T-S]
Radio Netherlands
Radio Yugoslavia
Voice of America (Americas, East Asia) (Special English) [T-S]
Voice of America (East Asia) (Special English) [M]
0045
Radio Korea (News Service)
0055
Radio Korea [T-A]
WRNO [W, A]

0100 UTC
(9:00 PM EDT, 6:00 PM PDT)
BBC
CBC, Northern Quebec [S-M]
Christian Science Monitor
Croatian Radio, Zagreb [S]
Deutsche Welle
FEBC Radio Int'l, Philippines
Radio Australia
Radio Belize
Radio Budapest
Radio Canada Int'l [S-M]
Radio Havana Cuba [T-S]
Radio Iraq Int'l
Radio Japan
Radio Luxembourg
Radio Moscow
Radio Prague Int'l
Radio Tashkent
Radio Thailand
Radiotelevisione Italiana
SBC Radio 1, Singapore
Spanish Foreign Radio
Voice of America
Voice of Indonesia
WWCR [T-A]
0115
Radio Havana Cuba* [T-S]
0130
Christian Science Monitor (Asia) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Finland [T-A]
Radio Havana Cuba [T-S]
Radio Netherlands
Radio Yugoslavia
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 Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Romania Int'l
Radio Thailand
RAE, Buenos Aires [T-A]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Free China
Voice of Myanmar
WWCR [T-A]
0215
Radio Cairo
Radio Nepal
0230
Christian Science Monitor (Africa, Europe) [M]
Christian Science Monitor [T-F]
HCJB
Radio Havana Cuba [T-S]
Radio Moscow
Radio Netherlands
Radio Pakistan (Special English)
Radio Portugal [T-A]
Radio Tirana, Albania
SLBC, Sri Lanka
0245
Radio Korea (News Service)
0250
Radio Yerevan

0300 UTC
(11:00 PM EDT, 8:00 PM PDT)
BBC
CBC, Northern Quebec
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
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
SBC Radio 1, Singapore
TWR, Bonaire
Voice of America
Voice of Free China
Voice of Turkey
WRNO [F]
WWCR [T-A]
0310
Radio Beijing*
0315
Radio Cairo
Radio Havana Cuba* [T-S]
0330
BBC (Africa)*
Christian Science Monitor (Africa, Europe) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l [T-A]
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Netherlands
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 Bahrain
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l
Radio Prague Int'l
Radio Romania Int'l
Radio RSA
Radio Tanzania
Radio Thailand
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
0405
Radio Pyongyang
0410
Radio Beijing*
0425
Radiotelevisione Italiana
0430
BBC (Africa)* [M-A]
Christian Science Monitor (Africa, Europe, NE Asia) [M]
Christian Science Monitor [T-F]
Radio Bahrain
Radio Botswana
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
0450
Radio RSA

0500 UTC
(1:00 AM EDT, 10:00 PM PDT)
BBC ("Newshour")
CBC, Northern Quebec
Christian Science Monitor
Croatian Radio, Zagreb
Deutsche Welle
HCJB
Radio Australia
Radio Bahrain
Radio Beijing
Radio Havana Cuba [T-S]
Radio Japan
Radio Lesotho
Radio Moscow
Radio Thailand
SBC Radio 1, Singapore
Spanish Foreign Radio
Voice of America
WWCR
0510
Radio Beijing*
Radio Botswana
0515
Radio Canada Int'l [M-F]
Radio Havana Cuba* [T-S]
0520
Radio Finland [T-A]
0530
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
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
0550
Radio For Peace Int'l [T-A]

0600 UTC
(2:00 AM EDT, 11:00 PM PDT)
BBC
Christian Science Monitor
Deutsche Welle
GBC Radio, Accra*
Radio Australia
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Korea
Radio Moscow
Radio New Zealand Int'l [M, F-A]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
WWCR [M-A]

newsline

0605
Radio Pyongyang
0609
BBC*
0610
Voice of Malaysia
0615
Radio Korea (News Service)
0630
BBC (Africa)*
BRT, Brussels
Christian Science Monitor [M-F]
Radio Austria Int'l [T-A]
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
RTV Congolaise, Brazzaville [M-F]
Voice of Nigeria
0640
Radio Prague Int'l
0645
Radio Finland [T-A]
Radio Romania Int'l
0655
Radio Korea [M-F]

0700 UTC
(3:00 AM EDT, 12:00 AM PDT)
BBC
Christian Science Monitor
GBC Radio, Accra
MBC, Blantyre, Malawi [M-A]
Radio Australia
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M, W-H]
SBC Radio 1, Singapore
SLBS, Freetown, Sierra Leone
Voice of Free China
Voice of Myanmar
0703
Croatian Radio, Zagreb
0705
Radio Pyongyang
0715
Radio Havana Cuba* [T-S]
0730
BBC (Africa)* [M-A]
Christian Science Monitor [M-F]
HCJB
Radio Austria Int'l
Radio Ghana
Radio Havana Cuba [T-S]
Radio Moscow (World Service)
Radio Netherlands
Radio Prague Int'l
0745
Radio For Peace Int'l [T-A]
0755
Radio Japan [M-F]

0800 UTC
(4:00 AM EDT, 1:00 AM PDT)
BBC
Christian Science Monitor
GBC Radio 1, Accra [S]
GBC Radio 2, Accra
MBC, Blantyre, Malawi [S]
Radio Australia
Radio Bahrain
Radio Finland [T-A]
Radio Korea
Radio Moscow
Radio New Zealand Int'l
Radio Pakistan
SBC Radio 1, Singapore
SLBS, Freetown, Sierra Leone
Voice of Indonesia
0805
Radio Pyongyang
0810
Voice of Malaysia
0830
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Finland [T-A]
Radio Netherlands
0840
Voice of Greece [M-A]
0855
Radio Korea [M-F]
Voice of Indonesia

0900 UTC
(5:00 AM EDT, 2:00 AM PDT)
BBC
BRT, Brussels [M-A]
Christian Science Monitor
Deutsche Welle
GBC Radio 1, Accra [M-F]
GBC Radio 2, Accra
MBC, Blantyre, Malawi M-A]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of Nigeria
0903
Croatian Radio, Zagreb
0910
Radio Beijing*
0915
Radio Korea (News Service)
0930
Christian Science Monitor [M-F]
Deutsche Welle (Africa)* [M-F]
Radio Afghanistan
Radio Moscow
Radio Netherlands
0940
Radio Togo
0950
Radio Tikhiy Okean [S]
0955
Radio Japan [M-F]

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)
All India Radio
BBC
Christian Science Monitor
GBC Radio 2, Accra [A]
HCJB
Kol Israel
MBC, Blantyre, Malawi [S]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Moscow
Radio New Zealand Int'l [T-W]
Radio RSA
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
1010
Radio Beijing*
1030
Christian Science Monitor [M-F]
MBC, Blantyre, Malawi [M-F]
Radio Austria Int'l [M-F]
Radio Korea
Radio Moscow
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
1040
Voice of Greece [M-A]
1055
All India Radio

1100 UTC
(7:00 AM EDT, 4:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Deutsche Welle
GBC Radio, Accra [A-S]
MBC, Blantyre, Malawi [A-S]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Japan
Radio Jordan
Radio Korea
Radio Moscow
Radio New Zealand Int'l
Radio Pakistan
Radio RSA
SBC Radio 1, Singapore
Swiss Radio Int'l
TWR, Bonaire [M-F]
Voice of America
WWCR [M-F]
1105
Radio Pakistan (Special English)
Radio Pyongyang
1110
Radio Beijing*
Radio Belize [T-A]
Radio Botswana [M-F]
1115
Radio Korea (News Service)
Radio Nepal
1125
Radio Belize [M]
Radio Botswana [A-S]
Radio Finland [T-F]
1130
BRT, Brussels [S]
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Austria Int'l [M-F]
Radio Lesotho
Radio Moscow
Radio Yugoslavia
RTM, Malaysia*
1135
Radio Thailand
1150
Radio RSA
1155
Radio Japan [M-F]
Radio Korea [M-F]

1200 UTC
(8:00 AM EDT, 5:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
MBC, Blantyre, Malawi [M-F]
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Beijing
Radio Bras, Brasilia [M-A]
Radio Canada Int'l [M-F]
Radio Moscow
Radio Romania Int'l
Radio Tashkent
Radio Thailand
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
Voice of America
WWCR [M-F]
1209
BBC* [M-A]
1210
Radio Beijing*
1215
HCJB [M-F]
Radio Korea
1230
Christian Science Monitor [M-F]
Radio Cairo
Radio Finland [T-F]
Radio France Int'l
Radio Moscow
SLBC, Sri Lanka
TWR, Bonaire
Voice of Turkey
1235
Voice of Greece
1245
SLBC, Sri Lanka
1255
WYFR (Network) [M-F]
1257
HCJB [M-F]
1258
Africa Number One, Libreville

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)
BBC ("Newshour")
BRT, Brussels [M-A]
CBC, Northern Quebec
Christian Science Monitor
GBC Radio, Accra
Kol Israel
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize
Radio Canada Int'l [S]
Radio Finland [A]
Radio Jordan
Radio Moscow
Radio Romania Int'l
Radio Tanzania [A-S]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
1303
Croatian Radio, Zagreb
1305
Radio Pyongyang
1310
Radio Beijing*
Radio Korea [M-F]
1320
SLBC, Sri Lanka
1325
HCJB [M-F]
1328
Radio Cairo
1330
All India Radio
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l [M-F]
Radio Canada Int'l [M-F]
Radio Finland [T-F]
Radio Korea (News Service)
Radio Moscow
Radio Netherlands
Radio Tashkent
RTM, Malaysia
UAE Radio, Dubai
Voice of America (Special English)
1346
All India Radio [A]
1350
Radio For Peace Int'l [T-A]

1400 UTC
(10:00 AM EDT, 7:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
GBC Radio, Accra
MBC, Blantyre, Malawi [M-F]
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio France Int'l
Radio Japan
Radio Korea
Radio Moscow
RTM, Malaysia*
SBC Radio 1, Singapore
Voice of America
WWCR [M-F]
1405
Radio Finland [T-A]
1410
Radio Beijing*
1415
Radio Canada Int'l
Radio Nepal
1425
HCJB [M-F]
1430
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Moscow
Radio Netherlands
Radio Tirana, Albania
1445
BBC (East Asia) (Spl English) [M-F]
Voice of Myanmar
1455
All India Radio
Radio Korea [M-F]

1500 UTC
(11:00 AM EDT, 8:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-A]

THE JAPAN RADIO CO.

NRD-535

THE NEXT GENERATION IN HIGH-PERFORMANCE HF RECEIVERS

Once again JRC breaks new ground in shortwave receiver design. The new NRD-535 has all the features SWLs and amateurs have been waiting for. General coverage from 0.1 to 30 MHz in AM, USB, LSB, CW, RTTY, FAX and Narrow FM modes. Advanced ECSS operation for phase-lock AM reception. Variable bandwidth control (BWC). Tuning accuracy to 1 Hz possible with direct digital synthesis. 200 memory channels with scan and sweep operation. Triple Superheterodyne receiving system. Superb sensitivity, selectivity and image rejection. Dual-width noise blanker eliminates impulse noise. Squelch, RF Gain, Attenuator, AGC and Tone controls. Optional RTTY demodulator available. 24 hour clock/timer. Easy to read vacuum fluorescent display with digital S-meter. AC and DC operation. Plus the most comprehensive computer interface found on any radio to date. Call or write today for a full color brochure, price list and dealer information.

JRC Japan Radio Co., Ltd.

MAIN OFFICE: Akasaka Twin Tower (Main), Akasaka 2-chome, Minato-ku, Tokyo 107, JAPAN
Tel.: (03) 584-8836 Telex: 242-5420 JRCTOK J

IN U.S.A.: 430 Park Avenue (2nd Floor), New York, NY 10022
Tel.: (212) 355-1180 FAX: (212) 319-5227 Telex: 961114 JAPAN RADIO NYK

newsline

Radio Japan
Radio Jordan
Radio Moscow
Radio Portugal [M-F]
Radio Romania Int'l
Radio RSA
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
1505
Radio Pyongyang
1510
Radio Beijing*
1520
Radio Tallinn [M-F]
1530
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
FEBA, Seychelles
FEBC Radio Int'l, Philippines
Radio Austria Int'l [M-F]
Radio Moscow
Radio Netherlands
Voice of Greece [M-A]
Voice of Nigeria
1545
Radio For Peace Int'l [T-A]
Radio Korea (News Service)

1600 UTC
(12:00 PM EDT, 9:00 AM PDT)
BBC
CBC, Northern Quebec [A]
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
MBC, Blantyre, Malawi
Radio Australia
Radio Bahrain
Radio Beijing
Radio Canada Int'l [M-F]
Radio France Int'l
Radio Jordan
Radio Korea
Radio Lesotho
Radio Moscow
Radio Pakistan
Radio RSA
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
Yemen Radio
1609
BBC*
1610
Radio Beijing*
Radio Botswana [M-F]
1615
Radio Pakistan (Special English)
1630
Christian Science Monitor [M-F]
Radio Canada Int'l [M-F]
Radio Moscow
UAE Radio, Dubai
Voice of America (except Africa) (Special English)
WYFR (Network) [A]
1635
WYFR (Network) [M-F]
1655
Radio Korea [M-F]

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC
CBC, Northern Quebec [A]
Christian Science Monitor
GBC Radio 2, Accra
Kol Israel
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Pakistan
Radio Prague Int'l
Radio RSA
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
1705
Radio Pyongyang
1710
Radio Beijing*
1715
Radio Korea (News Service)
1725
Radio Surinam Int'l [M-F]
WYFR (Network) [A]
1730
Christian Science Monitor [M-F]
Radio Moscow
Radio Netherlands
Radio Romania Int'l
Radio Sofia
1740
BBC (Africa)*
1750
Radio RSA

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
All India Radio
BBC
BRT, Brussels
CBC, Northern Quebec [M-H]
Christian Science Monitor
GBC Radio, Accra
KVOH
MBC, Blantyre, Malawi
Radio Afghanistan
Radio Australia
Radio Bahrain
Radio Belize [M-F]
Radio Bras, Brasilia [M-A]
Radio Canada Int'l [M-F]
Radio Korea
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Portugal [M-F]
Radio Tanzania
Voice of America
1830
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Belize
Radio Finland [M-F]
Radio Kuwait
Radio Moscow
Radio Netherlands
Radio Prague Int'l
Radio Yugoslavia
Voice of America (Special English)

1840
Voice of Greece
1845
Radio Cote d' Ivoire, Abidjan
1855
BBC (Africa)* [M-F]
Radio Finland
Radio Korea [M-F]
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
GBC Radio 2, Accra*
HCJB
Kol Israel
KVOH
Radio Australia
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Iraq Int'l
Radio Japan
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Portugal [M-F]
Radio Tanzania
RAE, Buenos Aires [M-F]
SLBS, Freetown, Sierra Leone
Spanish Foreign Radio
Voice of America
1910
Radio Beijing*
Radio Botswana
1920
Voice of Greece
1930
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Polish Radio, Warsaw
Radio Canada Int'l
Radio Ghana
Radio Havana Cuba [M-A]
Radio Moscow
Radio Netherlands
Radio Romania Int'l
Voice of Nigeria
1935
Radiotelevisione Italiana
1945
Radio Korea (News Service)
Radio Sofia
Radio Togo
1955
BBC (Africa)* [M-F]

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
BBC
CBC, Northern Quebec [S-F]
Christian Science Monitor
GBC Radio, Accra
KVOH
MBC, Blantyre, Malawi
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Budapest
Radio Havana Cuba [M-A]
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Prague Int'l
SLBS, Freetown, Sierra Leone
Swiss Radio Int'l
Voice of America
Voice of Indonesia
Voice of Nigeria
Voice of Turkey
WWCR (Program Two) [M-F]
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 Havana Cuba [M-A]
Radio Korea
Radio Moscow
WYFR (Network) [A]
2045
Radio Korea (News Service)
2055
Voice of Indonesia

2100 UTC
(5:00 PM EDT, 2:00 PM PDT)
All India Radio
BBC ("Newshour")
BRT, Brussels
CBC, Northern Quebec [S-F]
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
KVOH
MBC, Blantyre, Malawi
Radio Australia
Radio Bahrain
Radio Beijing
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Moscow
Radio New Zealand Int'l
Radio Prague Int'l
Radio Romania Int'l
Radio Ukraine
Radio Yugoslavia
SLBS, Freetown, Sierra Leone
Spanish Foreign Radio
Voice of America
WWCR (Program Two) [M-F]
2110
Radio Beijing*
2125
Radio Korea [M-F]
2130
Christian Science Monitor [M-F]
Kol Israel
Radio Austria Int'l
Radio Cairo
Radio Finland [M-F]
Radio Moscow
Radio Vilnius
WYFR (Network) [M-F]
2145
Radio Sofia
2150
Radio For Peace Int'l [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
GBC Radio 2, Accra
MBC, Blantyre, Malawi
Radio Australia
Radio Beijing
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Moscow
Radio New Zealand Int'l
Radio Tirana, Albania
Radiotelevisione Italiana
SBC Radio 1, Singapore
SLBS, Freetown, Sierra Leone
Swiss Radio Int'l
Voice of America
Voice of Free China
Voice of Turkey
2203
Croatian Radio, Zagreb
2208
Voice of America (Caribbean)* [M-F]
2209
BBC*
2210
Radio Beijing*
2225
Radio Havana Cuba* [M-A]
2230
Christian Science Monitor [M-F]
Radio Havana Cuba [M-A]
Radio Moscow
Radio New Zealand Int'l [A-H]
Voice of America (Special English)
2245
GBC Radio, Accra
Voice of Greece

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
All India Radio
BBC
CBC, Northern Quebec [A]
Christian Science Monitor [M-A]
Radio Australia
Radio Belize [M-F]
Radio Canada Int'l
Radio Japan
Radio Luxembourg
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Vilnius
RTM, Malaysia
SBC Radio 1, Singapore
Voice of America
2305
Radio Pyongyang
2320
Radio Thailand
2330
BRT, Brussels
Christian Science Monitor [M-F]
Radio Moscow
Radio Nacional, Bogota [A]
RTM, Malaysia*
2345
Radio For Peace Int'l [M-F]
2355
Radio Japan [M-F]
WRNO [W, F]

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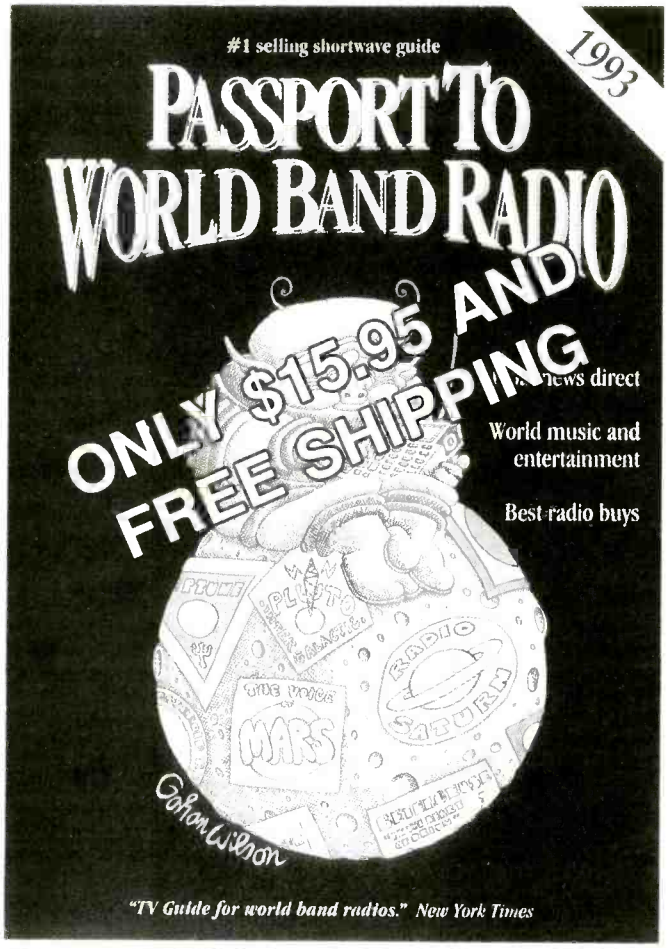

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English language

shortwave guide

0000 UTC [8:00 PM EDT/5:00 PM PDT]

FREQUENCIES

0000-0027	Czechoslovakia	7345na	9540na	11990na	
0000-0030	Australia	15170va	15320va	17630as	17750as
		17880as			
0000-0030	Canada, RCI Montreal	5960am	9755am	13670am	
0000-0030 a /var	Croatian Radio via WHRI	7315na	9495na		
0000-0030	Iran, Islamic Republic	9022am	9720am	15260am	
0000-0030	Iran, Islamic Republic	9022am	15260am	15315am	
0000-0030 sm	Norway	15165am			
0000-0030	Swiss Radio Int'l	6135na	9650na	9885na	12035na
		17730na			
0000-0030	United Kingdom,BBC London	5965as	5975na	6005af	6175na
		6195as	7145as	7325na	9580as
		9590na	9915na	11750sa	11945as
		11955as	12095na	15070na	15260sa
		15360pa	17830as		
0000-0045	Bulgaria, Radio Sofia	11660na	11720na	15330na	
0000-0050	North Korea	11335na	13760na	15115na	
0000-0100	Australia, ABC Brisbane	4920do	9660do		
0000-0100	Australia, ABC Perth	9610do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	China, Radio Beijing	9770na	11715na		
0000-0100	Cook Islands	11760pa			
0000-0100	Costa Rica, AWR	9725ca	11870ca		
0000-0100	Costa Rica, RFPI	7375na	15030na	21465na	
0000-0100	Cuba, RHC Havana	11970am			
0000-0100	Guam, KSDA Guam	15610as			
0000-0100	India, All India Radio	9910as	11715as	11745as	15110as
		15135as	15145as	17830as	
0000-0100 vl	Iraq, Radio Iraq Int'l	11945na	17740sa		
0000-0100	Luxembourg, RTL	15350va			
0000-0100	Malaysia, RTM Radio 4	7295do			
0000-0100	New Zealand, RNZI	17770pa			
0000-0100	Philippines, FEBC Manila	15450as			
0000-0100	Russia, Radio Moscow	11710na	11780na	11850na	12040na
		12050na	15290na	15405na	15410na
		15425na	15485na	17570na	21690na
0000-0100	Sierra Leone, SLBS	3316do			
0000-0100	Singapore, SBC1	5010do	5052do	11940do	
0000-0100	South Korea, Seoul	15575na			
0000-0100	Spanish National Radio	9530na			
0000-0100	Thailand	4830as	9655as	11905as	
0000-0100	Ukraine, Kiev	7195eu	7250eu	9640eu	10344eu
		11520eu	11790na	12000na	12040na
		12060na	13645na	15355na	15570na
0000-0100	USA, CSMonitor Boston	7395na	9850af	13760na	17555as
0000-0100 sa	USA, CSMonitor Boston	17865as			
0000-0100	USA, KTBN Salt Lake City	15590am			
0000-0100	USA, KVOH Los Angeles	17775am			
0000-0100	USA, VOA Washington	6130am	7405am	9455am	9775am
		11580am	11695am	15120am	15205am
0000-0100	USA, WHRI Noblesville	7315am	9495am		
0000-0100	USA, WINB Red Lion, Penn.	15145eu			
0000-0100	USA, WJCR Upton, Kentucky		7490na		
0000-0100	USA, WRNO New Orleans	7355am			
0000-0100	USA, WWCR Nashville	5920na	7435na		
0000-0100	USA, WYFR Okeechobee, FL		5985am		
0030-0100	Australia	15320va	15365pa	15420pa	17630as
		17715pa	17750as	17795pa	17880as
		21740pa	21775as		
0030-0100 mtwhf	Canada, RCI Montreal	5960am	9755am		
0030-0100	Ecuador, HCJB Quito	9745am	15155am	21455am	
0030-0100	Netherlands	6020na	6165na	9860as	11655as
		11835na	13700as		
0030-0100	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0030-0100	United Kingdom,BBC London	5965as	5975na	6005sa	6175na
		7135as	7325na	9580as	9590na
		9915na	11750sa	11955as	12095na
		15070na	15260sa	15360pa	
0030-0100	Yugoslavia, Radio Federal	11870am			
0040-0050 twhfas	Venezuela, Radio Nacional	9540om			
0045-0100	South Korea World News	7275as			

SELECTED PROGRAMS

Sundays

0015 Radio Korea: News Commentary. Opinion on developments in Korea and worldwide.
0020 Radio Korea: Sites And Sounds. A look at Korea's tourist attractions and industry.
0030 BBC: The Ken Bruce Show. Ken Bruce plays pop music, past and present.
0030 Radio Australia: Book Reading. Serialized readings from popular books.
0035 Radio Korea: From Us To You. Listener letters, questions, and comments, interspersed with Korean music.

Mondays

0015 Radio Korea: Echoes Of Korean Music. See S 1115.
0030 BBC: In Praise Of God. Christian religious services and meditations.
0030 Radio Australia: Just Out. Rob Hoskin plays recent Australian music releases.
0035 Radio Korea: Shortwave Feedback. See S 1135.

Tuesdays

0015 Radio Korea: News Commentary. See S 0015.
0020 Radio Korea: Seoul Calling. See M 1120.
0030 BBC: Panel Game. "Back To Square One" is a quiz on curious expressions in the English language (thru Aug. 11st).
0030 Radio Australia: Music/Information. See S 0330.
0040 Radio Korea: Tales From Korea's Past. See M 1140.

Wednesdays

0015 Radio Korea: News Commentary. See S 0015.
0020 Radio Korea: Seoul Calling. See M 1120.
0030 BBC: Omnibus. Topical features on almost any topic, from Dracula to drugs.

Mike Bullen is one of BBC's presenters of Dateline East Asia.

0030 Radio Australia: Music/Information. See S 0330.
0040 Radio Korea: Korean Cultural Variety. See T 1140.

Thursdays

0015 Radio Korea: News Commentary. See S 0015.
0020 Radio Korea: Seoul Calling. See M 1120.
0030 BBC: Comedy/Drama. See W 1530.
0030 Radio Australia: Music/Information. See S 0330.
0040 Radio Korea: Pulse Of Korea. See W 1140.

Fridays

0015 Radio Korea: News Commentary. See S 0015.
0020 Radio Korea: Seoul Calling. See M 1120.
0030 BBC: Music Feature. All this month, musicians like Itzhak Perlman talk about other musicians on "The Musician's Musician."
0030 Radio Australia: Music/Information. See S 0330.
0040 Radio Korea: Forward To Reunification. See H 1140.

Saturdays

0015 Radio Korea: News Commentary. See S 0015.
0020 Radio Korea: Let's Sing Together. See F 1120.
0030 BBC: From The Weeklies. A review of the British weekly press.
0030 Radio Australia: Word Of Mouth. See M 1445.
0040 Radio Korea: Let's Learn Korean! See F 1140.
0045 BBC: Recording Of The Week. See M 0615.

0100 UTC [9:00 PM EDT/6:00 PM PDT]

FREQUENCIES

0100-0115	India, All India Radio	9910as	11715as	11745as	15110as
		15135as	15145as	17830as	
0100-0115 vl	Iraq, Radio Iraq Int'l	11945na	17740sa		
0100-0120	Italy, RAI, Rome	9575am	11800am		
0100-0125	Netherlands	6020na	6165na	9860as	11655as
		11835na	13700as		
0100-0127	Czechoslovakia	5930na	7345na	9540na	
0100-0130 twhfa	Canada, RCI Montreal	5960am	9755am		
0100-0130	Laos, National Radio of	7116as			
0100-0130 sm	Norway	9615am			
0100-0130	Sweden	9685as	11730as		
0100-0130	Uzbekhistan, R. Tashkent	5930as	5995as	7190as	7265as
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9565na
		9700na	11810na	11865na	13610na
		13770na	15105na		
0100-0159 sm	Canada, RCI Montreal	9535am	9755am	11845am	11940am
		13720am			
0100-0200	Australia	15240pa	15320va	15365pa	17630as
		17715pa	17750as	17795pa	17880as
		21740pa	21775as		
0100-0200	Australia, ABC Brisbane	4920do	9660do		
0100-0200	Australia, ABC Perth	9610do			
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Cook Islands	11760pa			
0100-0200	Costa Rica, RFPI	7375na	15030am	21465am	
0100-0200	Cuba, RHC Havana	11970am			
0100-0200	Ecuador, HCJB Quito	9745am	15155am	21455am	
0100-0200	Indonesia, Voice of	7125as	9675as	11752as	11785as
0100-0200	Japan NHK	5960na	11840me	15195as	17810as
		17835as	17845as		
0100-0200	Luxembourg, RTL	15350va			
0100-0200 smtwh	Malaysia, RTM Radio 4	7295do			
0100-0200	Namibia BC Corp, Windhoek	3290af			
0100-0200	New Zealand, RNZI	17770pa			
0100-0200	Philippines, FEBC Manila	15450as			
0100-0200	Russia, Radio Moscow	11710na	11780na	11850na	12040na
		12050na	15290na	15405na	15410na
		15425na	15485na	17570na	21690na
0100-0200	Sierra Leone, SLBS	3316do			
0100-0200	Singapore, SBC1	5010do	5052do	11940do	
0100-0200	Spanish National Radio	9530na			
0100-0200	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0100-0200	Thailand	4830as	9655as	11905as	
0100-0200	United Kingdom,BBC London	5965as	5975na	6005sa	6175na
		7135as	7325na	9580as	9590na
		9915na 1	1750sa	11955as	12095na
		15260sa	15280as	15360pa	21715as
0100-0200	USA, CSMonitor Boston	7395na	9850af	13760na	17555as
0100-0200 sa	USA, CSMonitor Boston	17865as			
0100-0200	USA, KTBN Salt Lake City	7510na			
0100-0200	USA, VOA Washington	5995am	6130am	7405am	9455am
		9775am	11580am	15120am	15205am
0100-0200	USA, VOA Washington	7115as	7205as	9740as	11705as
		15250as	17735as	21550as	
0100-0200	USA, WHRI Noblesville	7315am			
0100-0200	USA, WINB Red Lion, Penn.	15145na			
0100-0200	USA, WJCR Upton, Kentucky		7490na		
0100-0200	USA, WRNO New Orleans	7355na			
0100-0200	USA, WWCR Nashville	5920na	7435na		
0100-0200	USA, WYFR Okeechobee, FL		5985am	9505am	15440am
0100-0200	Yugoslavia, Radio Federal	11870na			
0130-0150 mtwhfa	Greece, Voice of	9395na	9420na	11645na	
0130-0155	Finland, YLE	11755na	15185na		
0130-0200	Austria, ORF Vienna	9875na	13730na		
0130-0200	Netherlands	9860as	11655as	13700as	
0130-0200	UAE Radio, Dubai	11795na	13695eu	15320eu	15435eu
0145-0200	Vatican Radio	9650as	11935as		

SELECTED PROGRAMS

Sundays

0101 BBC: Play Of The Week. This month's selections: "Faith, Hope, And Charity" (5th); "Faith Healer" (12th, starts at 0030 UTC); "Happy Birthdays" (19th); "Supper Of Ashes" (26th).
0109 Deutsche Welle: Commentary. Opinion on current issues.
0115 Radiotelevisione Italiana: Tunes For Whistling. Italian popular and jazz music.
0117 Deutsche Welle: Feature. "Mailbag," "Nickelodeon" (listener requests for German music), or "Technical Tips For DX'ers."
0130 Radio Australia: At Your Request. Dick Paterson plays music requests.
0134 Deutsche Welle: German By Radio. An advanced German language course for English speakers.

Mondays

0101 BBC: Feature/Drama. Another series of "Opera Of The Week" (6th/13th) is followed by the favorite writing of celebrities on "With Great Pleasure" (through September 7th).
0109 Deutsche Welle: Commentary. See S 0109.
0115 Radiotelevisione Italiana: No Parking. Italian popular music.
0116 Deutsche Welle: Living in Germany. A weekly look at the social scene in Germany.
0130 Radio Australia: Music/Information. See S 0330.
0134 Deutsche Welle: Larry's Random Selection. Larry Wayne takes a look at Germany from the lighter side.
0145 BBC: Feature. Traditions and rituals from Britain feature on "Rites Of Man" (through August 10th).

Tuesdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0115 Radiotelevisione Italiana: Light Music. Italian popular, jazz, and easy listening music.
0130 BBC: Folk In Britain. Ian Anderson is the host, folk music is the fare.
0130 Radio Australia: Music/Information. See S 0330.
0134 Deutsche Welle: Transatlantic Diary. Cultural, science, and economic developments between the US and Germany.
0145 BBC: Health Matters. New medical developments and methods of keeping fit.

Wednesdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0115 Radiotelevisione Italiana: Window on the Bay. Selections of Italian music.
0130 BBC: Talks. Leslie Goffe presents a new series of "Your Questions Of Faith" (through August 19th).
0130 Radio Australia: Music/Information. See S 0330.
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.
0115 Radiotelevisione Italiana: Light Music. See T 0115.
0130 BBC: Waveguide. See W 0415.
0130 Radio Australia: Music/Information. See S 0330.
0134 Deutsche Welle: Transatlantic Diary. See T 0134.
0140 BBC: Book Choice. See W 0425.
0145 BBC: The Farming World. Agricultural news and technological innovations for farmers.
0105 BBC: Outlook. See M 1405.

Fridays

0109 Deutsche Welle: European Journal. See M 0209.
0115 Radiotelevisione Italiana: Light Music. See T 0115.
0130 BBC: Seven Seas. Malcolm Billings presents news about ships and the sea.
0130 Radio Australia: Music/Information. See S 0330.
0134 Deutsche Welle: Transatlantic Diary. See T 0134.
0145 BBC: Global Concerns. An update on environmental issues.

Saturdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0209.
0115 Radiotelevisione Italiana: Contrast In Music. Selections of Italian music.
0130 BBC: Short Story (except 4th: Seeing Stars). See S 0430.
0130 Radio Australia: Music/Information. See S 0330.
0134 Deutsche Welle: Through German Eyes. See S 1513.
0145 BBC: Jazz Now And Then. George Reid presents a weekly mix of new releases, old tracks, and interviews.

English language

shortwave guide

0200 UTC [10:00 PM EDT/7:00 PM PDT]

FREQUENCIES

0200-0225	Netherlands	9860as	11655as	13700as	
0200-0230 mtwhfa	Kenya, Voice of	4935do			
0200-0230 sm	Norway	11930na			
0200-0230	Philippines, FEBC Manila	15450as			
0200-0230	Sri Lanka B'casting Corp.	6005as	9720as	15425as	
0200-0230	Sweden	9695na	11705na		
0200-0230	Swiss Radio Int'l	6135am	9650am	9885am	12035am
0200-0230	United Kingdom,BBC London	5975na	6005sa	6175na	6195eu
		7135as	7325na	9580as	9590na
		9670me	9915na	11750sa	11955as
		12095va	15260sa	15280as	15360pa
		15380as	21715as		
0200-0230	USA, VOA Washington	5995am	7405am	9775am	11580am
		15120am	15205am		
0200-0250	Germany, Deutsche Welle	7285as	9615as	9690as	11945as
		11965as	15235as	15560as	
0200-0259 twhfa	Canada, RCI Montreal	6120sa	9535sa	9755sa	11940sa
		13720sa			
0200-0300 twhf	Argentina,RAE BuenosAires	11710am			
0200-0300	Australia	15240pa	15320va	15365pa	17630as
		17715pa	17750pa	17880as	21525as
		21740pa	21775as		
0200-0300	Australia, ABC Brisbane	4920do	9660do		
0200-0300	Australia, ABC Perth	6070do	9610do		
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Cook Islands	11760pa			
0200-0300	Costa Rica, RFPI	7375na	15030na	21465na	
0200-0300	Cuba, RHC Havana	11970na	13700na		
0200-0300	Ecuador, HCJB Quito	9745am	15155am	21455am	
0200-0300	Egypt, Radio Cairo	9475na	9675na		
0200-0300 as	Guam, KSDA Guam	13720as			
0200-0300	Hungary, Radio Budapest	6110na	9835na	11910na	
0200-0300	Luxembourg, RTL	15350va			
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do			
0200-0300	Namibia BC Corp, Windhoek	3290af			
0200-0300	New Zealand, RNZI	17770pa			
0200-0300	Romania, R.Romania Int'l	5990am	6155am	9510am	9570am
		11830am	11940am		
0200-0300	Russia, Radio Moscow	9470na	9530na	9685na	11710na
		11850na	12040na	12050na	15290na
		15405na	15410na	15425na	17560na
		17570na	17685na	17860na	21690na
0200-0300	Sierra Leone, SLBS	3316do			
0200-0300	Singapore, SBC1	5010do	5052do	11940do	
0200-0300	South Africa, Radio RSA	7270af			
0200-0300	Taiwan, V. of Free China,	5950na	9680na	9765pa	11740ca
		11860as	15345as		
0200-0300	Thailand	4830as	9655as	11905as	
0200-0300	USA, CSMonitor Boston	9350af	9455na	13760sa	
0200-0300 sa	USA, CSMonitor Boston	17555as	17865as		
0200-0300	USA, KTBN Salt Lake City	7510am			
0200-0300	USA, KVOH Los Angeles	17775am			
0200-0300	USA, VOA Washington	7205as	9740as	11705as	15120am
		15205am	15250as	17735as	21550as
0200-0300	USA, WHRI Noblesville	7315na			
0200-0300	USA, WINB Red Lion, Penn.	15145eu			
0200-0300	USA, WJCR Upton, Kentucky		7490na		
0200-0300	USA, WRNO New Orleans	7355am			
0200-0300	USA, WWCR Nashville	5920na	7435am		
0200-0300	USA, WYFR Okeechobee, FL		5985am	9505am	15440am
0230-0245	Pakistan	9515as	15115as	17640as	21730as
0230-0300	Albania, Radio Tirana	9580na	11825na		
0230-0300 s	Kenya, Voice of	4935do			
0230-0300	Netherlands	9860as	11655as	13700as	
0230-0300	Phillipines, Manila	17760pa	17840pa	21580pa	
0230-0300 twhfa	Portugal	9570am	9600am	9705am	11840am
0230-0300	Sri Lanka B'casting Corp.	9720as	15425as		
0230-0300	United Kingdom,BBC London	5975na	6005sa	6175na	6195eu
		7135me	7325na	9670me	9915na
		11750sa	11955me	12095va	15260sa
		15280as	15360pa	21715as	
0240-0300	Zambia, Radio 2, Lusaka	6165do	7235do		
0245-0300	South Korea, Seoul	9640am	11805am	15575am	
0250-0300	Vatican Radio	7305na	9605na	11620na	
0255-0300	Bonaire, TWR Bonaire	11930am			

SELECTED PROGRAMS

Sundays

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. This month, hear a look at the sister-city movement in "Twin Tracks" (5th, 12th); "Not Just A Game" investigates the nature of sports (19th, 26th).
0230 Radio Australia: Fine Music Australia. The best in Australian classical music.

Mondays

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. This month: "Les Six."
0230 Radio Australia: Music/Information. See S 0330.
0234 Deutsche Welle: Science and Technology. New scientific and technological developments.

Tuesdays

0209 Deutsche Welle: European Journal. See M 0209.
0230 BBC: Quiz. See M 1215.
0230 Radio Australia: Music/Information. See S 0330.
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 '92. Aid and development issues for developing nations.
0230 Radio Australia: Book Reading. See S 0030.
0234 Deutsche Welle: Insight. See T 1534.

Thursdays

0209 Deutsche Welle: European Journal. See M 0209.
0230 BBC: Sports International. Live play-by-play, interviews, features, and discussions from the sports world.
0230 Radio Australia: Music/Information. See S 0330.
0234 Deutsche Welle: Living in Germany. See M 0116.

Fridays

0209 Deutsche Welle: European Journal. See M 0209.
0230 BBC: Drama. See H 1130.
0230 Radio Australia: Music/Information. See S 0330.
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.
0230 Radio Australia: This Australia. See S 0430.
0234 Deutsche Welle: Economic Notebook. See F 1534.

0300 UTC [11:00 PM EDT/8:00 PM PDT]

FREQUENCIES

0300-0315	Vatican Radio	7305na	9605na	11620na	
0300-0325	Netherlands	9860as	11655as	13700as	
0300-0330	Czechoslovakia	5930na	7345na	9540na	
0300-0330	Egypt, Radio Cairo	9475na	9675na		
0300-0330	Japan NHK	5960am	15325am	17810am	17825am
		21610am			
0300-0330	Phillipines, Manila	17760pa	17840pa	21580pa	
0300-0330	United Kingdom,BBC London	3255af	5075	5975na	6005af
		6005sa	6175na	6180eu	6190af
		6195eu	7135me	7325na	9410eu
		9600af	9670me	9915na	11730af
		11760me	11955me	12095eu	15070af
0300-0330	United Kingdom,BBC London	11750sa	15260sa	15310as	
0300-0330	USA, VOA Washington	5965eu 1	1905me	15160me	17810eu
		17895me			
0300-0350	Germany, Deutsche Welle	6085na	6145na	9640na	9700na
		11810na	13610na	13770na	15205na
		22890na			
0300-0400	Australia	15240pa	15320va	15365pa	17630as
		17715pa	17750as	17795pa	17880as
		21525as	21740pa	21775as	
0300-0400	Australia, ABC Brisbane	4920do	9660do		
0300-0400	Australia, ABC Perth	9610do			
0300-0400	Bahrain Broadcasting Svc	6010me			
0300-0400	Bonaire, TWR Bonaire	9535am	11930am		
0300-0400	Bulgaria, Radio Sofia	9850af	11720af	11765af	15160na
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, Radio Beijing	9690na	9770na	11715na	
0300-0400	Cook Islands	11760pa			
0300-0400	Costa Rica, RFPI	7375na	15030na	21465na	
0300-0400	Costa Rica, TIFC	5055ca			
0300-0400	Cuba, RHC Havana	6180na	11760am	11970am	13700na
0300-0400	Ecuador, HCJB Quito	9745am	15155am	21455am	
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400	Honduras, HRPC Luz y Vida	3250ca			
0300-0400	Kenya, Voice of	4935do			
0300-0400	Luxembourg, RTL	15350va			
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do			
0300-0400	New Zealand, RNZI	17770pa			
0300-0400	Russia, Radio Moscow	9470na	9685na	11675na	11710na
		11850na	12050na	15405na	15425na
0300-0400	Sierra Leone, SLBS	3316do			
0300-0400	Singapore, SBC1	5010do	5052do	11940do	
0300-0400	South Africa, Radio RSA	5960af	7270af		
0300-0400	Sri Lanka B'casting Corp.	9720as	15425as		
0300-0400	Taiwan, V. of Free China,	5950na	9680na	9765as	11745as
		15345na			
0300-0400	Tanzania	5985af	9685af	11765af	
0300-0400	Thailand	4830as	9655as	11905as	
0300-0400	Turkey, Voice of	9445na			
0300-0400	USA, CSMonitor Boston	9350af	9455na	13760sa	
0300-0400 sa	USA, CSMonitor Boston	17555as	17865as		
0300-0400	USA, KTBN Salt Lake City	7510am			
0300-0400	USA, VOA Washington	5135af	6035af	7265af	7405af
		9575af	11835af	11940	15115af
		17715af	21600af		
0300-0400	USA, WHRI Noblesville	7315na			
0300-0400	USA, WJCR Upton, Kentucky		7490na		
0300-0400 vl	USA, WRNO New Orleans	7395am			
0300-0400	USA, WWCR Nashville	5920na	7435na		
0300-0400	USA, WYFR Okeechobee, FL		6065am	9505am	
0330-0400	Albania, Radio Tirana	9580na	11825na		
0330-0400	Austria, ORF Vienna	9870ca	13730am		
0330-0400	Japan NHK	5960na	11870na	17810na	
0330-0400	Netherlands	6165na	9590na		
0330-0400	UAE Radio, Dubai	11945na	13675na	15400na	15435na
0330-0400	United Kingdom,BBC London	3255af	5975na	6005af	6175va
		6180eu	6190af	6195eu	9410eu
		9600af	9915na	11740af	11760me
		11955me	12095eu	15280as	15310as
		15420af	17885af	21715as	
0340-0350 mtwhfa	Greece, Voice of	9395na	9420na	11645na	
0340-0350 twhfas	Venezuela, Radio Nacional	9540om			
0350-0400 varies	Armenia, Yerevan	9530na	11770na	17605na	17690na

SELECTED PROGRAMS

Sundays

0309 BBC: Words Of Faith. Speakers from various faiths discuss scripture and their beliefs.
0309 Deutsche Welle: Commentary. See S 0109.
0313 Radio Australia: Back Page. Brendon Telfer looks at sports in the Asian/Pacific region.
0315 BBC: Sports Roundup. News from the world of sports.
0317 Deutsche Welle: Feature. See S 0117.
0330 BBC: From Our Own Correspondent. Reporters comment on the background to the news.
0330 Radio Australia: Music/Information. Overnight music, interspersed with news.
0334 Deutsche Welle: German By Radio. See S 0134.
0350 BBC: Write On... Listener letters, opinions, and questions.

Mondays

0309 BBC: Words Of Faith. See S 0309.
0309 Deutsche Welle: Commentary. See S 0109.
0313 Radio Australia: Sports Report. See S 1313.
0315 BBC: Sports Roundup. See S 0315.
0316 Deutsche Welle: Living in Germany. See M 0116.
0330 BBC: Anything Goes. See S 1430.
0330 Radio Australia: Music/Information. See S 0330.
0334 Deutsche Welle: Larry's Random Selection. See M 0134.

Tuesdays

0309 BBC: Words Of Faith. See S 0309.
0309 Deutsche Welle: European Journal. See M 0209.
0313 Radio Australia: Sports Report. See S 1313.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: John Peel. Newly released albums and singles from the contemporary music scene.
0330 Radio Australia: Music/Information. See S 0330.
0334 Deutsche Welle: Transatlantic Diary. See T 0134.

Wednesdays

0309 BBC: Words Of Faith. See S 0309.
0309 Deutsche Welle: European Journal. See M 0209.
0313 Radio Australia: Sports Report. See S 1313.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Pop Science. Vitamin K meets Kylie Minogue as Janice Long moderates.
0330 Radio Australia: Music/Information. See S 0330.
0334 Deutsche Welle: Transatlantic Diary. See T 0134.

Thursdays

0309 BBC: Words Of Faith. See S 0309.
0309 Deutsche Welle: European Journal. See M 0209.
0313 Radio Australia: Sports Report. See S 1313.
0315 BBC: Sports Roundup. See 0315.
0330 BBC: Assignment. A weekly examination of topical issues, from Batman to the Amazon.
0330 Radio Australia: Music/Information. See S 0330.
0334 Deutsche Welle: Transatlantic Diary. See T 0134.

Fridays

0309 BBC: Words Of Faith. See S 0309.
0309 Deutsche Welle: European Journal. See M 0209.
0313 Radio Australia: Sports Report. See S 1313.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Focus On Faith. Comment and discussion on major issues in various religions.
0330 Radio Australia: Music/Information. See S 0330.
0334 Deutsche Welle: Transatlantic Diary. See T 0134.

Saturdays

0309 BBC: Words Of Faith. See S 0309.
0309 Deutsche Welle: European Journal. See M 0209.
0313 Radio Australia: Music/Information. See S 0330.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: The Vintage Chart Show. Paul Burnett with past Top 20 pop music hits.
0330 Radio Australia: Women In Politics. Interviews with women politicians.
0334 Deutsche Welle: Through German Eyes. See S 1513.

0400 UTC [12:00 PM EDT/9:00 PM PDT]

FREQUENCIES

0400-0415	Israel, Kol Israel	11588am			
0400-0425	Netherlands	6165na	9590na		
0400-0427	Czechoslovakia	5930na	7345na	9540na	
0400-0430	Bonaire, TWR Bonaire	9535am	11930am		
0400-0430	Bulgaria, Radio Sofia	9850eu	11720eu	15160eu	
0400-0430	Canada, RCI Montreal	9650eu	11905eu	15275me	15445me
0400-0430 varies	Croatian Radio via WHRI	7315na	9495na		
0400-0430	Cuba, RHC Havana	6180am	11760am	11970na	13700am
0400-0430	Ecuador, HCJB Quito	9745am	15155am	21455am	
0400-0430	Guatemala, Radio Cultural	3300do			
0400-0430 sm	Norway	9560na	11865na		
0400-0430	Romania, R.Romania Int'l	5990am	6155am	9510am	9570am
		11830am	11940am		
0400-0430	Sri Lanka B'casting Corp.	9720as	15425as		
0400-0430	Swiss Radio Int'l	6135am	9885am	12035am	13635me
0400-0430	Tanzania	5985af	9685af	11765af	
0400-0430	Thailand	4830as	9655as	11905as	
0400-0430	United Kingdom,BBC London	3255af	3955eu	5975na	6180eu
		6190af	6195eu	7105af	7230eu
		7325na	9410eu	9600af	9610af
		9915na	11760me	15070va	15280as
		15310as	15420af	15590eu	17885af
0400-0430	United Kingdom,BBC London	6005af	6175am	11750va	11955me
		12095va	21715as		
0400-0450	Germany, Deutsche Welle	6130af	6145af	7150af	7225af
		9565af	9765af	11705af	11765af
		13610af	13770af		
0400-0450	North Korea	15180as	15230as	17765as	
0400-0500	Australia	15240pa	15365pa	17630as	17715pa
		17750as	17795pa	21525as	21740pa
		21775as			
0400-0500	Australia, ABC Brisbane	4920do	9660do		
0400-0500	Australia, ABC Perth	9610do			
0400-0500	Bahrain Broadcasting Svc	6010me			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0500	China, Radio Beijing	11685am			
0400-0500	China, Radio Beijing	11685na	11840na		
0400-0500	Cook Islands	11760pa			
0400-0500	Costa Rica, RFPI	7375na	15030na	21465na	
0400-0500	Kenya, Voice of	4935do			
0400-0500	Luxembourg, RTL	15350va			
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do			
0400-0500 mtwhf	Namibia BC Corp, Windhoek	3270af	3290af		
0400-0500	New Zealand, RNZI	17770pa			
0400-0500	Russia, Radio Moscow	9470na	9685na	11675na	11850na
		11980na	12040na	12050na	13665na
		15405na	15425na	17605na	
0400-0500	Sierra Leone, SLBS	3316do			
0400-0500	Singapore, SBC1	5010do	5052do	11940do	
0400-0500	South Africa, Radio RSA	5960af	9695af		
0400-0500 vl	South Africa,Radio Oranje	3215do			
0400-0500	USA, CSMonitor Boston	9445am	9840af	9870na	13760na
		17780as			
0400-0500 sa	USA, CSMonitor Boston	17555as			
0400-0500	USA, KTBN Salt Lake City	7510am			
0400-0500	USA, KVOH Los Angeles	9785am			
0400-0500	USA, VOA Washington	5995eu	6040me	6140me	7170eu
		7200eu	9715eu	15205na	
0400-0500	USA, WHRI Noblesville	7315na	9495sa		
0400-0500	USA, WJCR Upton, Kentucky		7490na		
0400-0500 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
0400-0500	USA, WRNO New Orleans	7395am			
0400-0500	USA, WWCR Nashville	5920na	7435na		
0400-0500	USA, WYFR Okeechobee, FL		5985am	9505am	
0400-0500	Zambia, Radio 2, Lusaka	6165do	7235do		
0415-0440	Italy, RAI, Rome	7275me	9575me		
0430-0500	Cuba, RHC Havana	6180na	11760na	11970na	
0430-0500	Nigeria	3326do	4770do		
0430-0500	Swaziland, TWR Swaziland	5055af	5965af	9655af	11750af
0430-0500	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	7230eu
		9410eu	9600af	11760me	12095va
		15070va	15280as	15310as	15400af
		15420af	15590eu	21470af	21715as
0430-0500	USA, VOA Washington	5995me	6040me	6140me	7170me
		7200me	7265me	9715me	11815me
0430-0500 s	Zambia,Radio Zambia Int'l	9505af	11880af	17895af	
0445-0500 t	Sri Lanka B'Casting Svc	9720am	15425am		
0455-0600	Nigeria, Voice of	7255af			

SELECTED PROGRAMS

Sundays

0409 Deutsche Welle: Commentary. See S 0109.
0413 Deutsche Welle: Sports Report. See S 0213.
0415 BBC: Feature. Take an alphabetical odyssey on "An A-Z Of Rock 'N' Pop" (5th); then join "Stuart Colman's Record Hop" (through September 27th).
0419 Deutsche Welle: International Talking Point. A round-table discussion on major trends and events.
0430 BBC: Short Story. This month: Sports is the theme for "Long-Distance Runner" (12th); "Berlin Crawling" (19th); and "Woman Bathing" (26th) (except 5th: Seeing Stars, a monthly look at astronomy).
0430 Radio Australia: This Australia. Documentaries about the land "down under."
0434 Deutsche Welle: People and Places. Interviews, stories, and music beamed to Africa.
0445 BBC: Talks. A ramble through the Continent features on "Keep To The Path Through Europe" (through August 9th).

Mondays

0409 Deutsche Welle: European Journal. See M 0209.
0415 BBC: Feature. Join Martin Redfern as he takes a "Journey To The Center Of The Universe" (through September 28th).
0430 BBC: Off The Shelf. This month's serialized readings are Penelope Lively's "According To Mark" (2nd-17th) and Kurt Diemburger's "The Endless Knot" (20th-31st).
0430 Radio Australia: Matters Of Faith. Dallas Adair examines the doctrines and beliefs of Asian/Pacific faiths.
0434 Deutsche Welle: Africa in the German Press. A look at what German papers and weeklies have to say about Africa.
0445 BBC: Andy Kershaw's World Of Music. Exotic music from the world over.

Tuesdays

0409 Deutsche Welle: European Journal. See M 0209.
0415 BBC: Health Matters. See T 0145.
0430 BBC: Off The Shelf. See M 0430.
0430 Radio Australia: World Of Country Music. A look at country music from all around the world.
0434 Deutsche Welle: Africa Report. Reports and background to the news from correspondents.
0445 BBC: Talks. See M 2315.
0455 BBC: Talks. See M 2325.

Wednesdays

0409 Deutsche Welle: European Journal. See M 0209.
0415 BBC: Waveguide. Tips on how to hear the BBC better.
0425 BBC: Book Choice. A short review of a recently released book.
0430 BBC: Off The Shelf. See M 0430.
0430 Radio Australia: Music Of Radio Australia. See S 1113.
0434 Deutsche Welle: Africa Report. See T 0434.
0445 BBC: Country Style. See W 0145.

Thursdays

0409 Deutsche Welle: European Journal. See M 0209.
0415 BBC: The Farming World. See H 0145.
0430 BBC: Off The Shelf. See M 0430.
0430 Radio Australia: Music Of Radio Australia. See S 1113.
0434 Deutsche Welle: Africa Report. See T 0434.
0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

0409 Deutsche Welle: European Journal. See M 0209.
0415 BBC: Feature. See M 0145.
0430 BBC: Off The Shelf. See M 0430.
0430 Radio Australia: Communicator. See S 1430.
0434 Deutsche Welle: Africa Report. See T 0434.
0445 BBC: Folk In Britain. See T 0130.

Saturdays

0409 Deutsche Welle: Commentary. See S 0109.
0415 BBC: Good Books (except 25th: A Month In The Country). See W 1445.
0423 Deutsche Welle: Panorama. See A 0223.
0430 BBC: Jazz Now And Then. See A 0145.
0430 Radio Australia: Business Horizons. See T 1130.
0434 Deutsche Welle: Man and Environment. See T 0234.
0445 BBC: Worldbrief. See F 2315.

0500 UTC [1:00 AM EDT/10:00 PM PDT]

FREQUENCIES

0500-0510	Lesotho, Maseru	4800do			
0500-0510 w	Malawi B'casting Corp.	3381do			
0500-0515 t	Sri Lanka B'Casting Svc	9720am	15425am		
0500-0530	Cameroon CRTV Beau	3970do			
0500-0530	Swaziland, TWR Swaziland	5965af	9655af	11750af	
0500-0530	United Kingdom,BBC London	3255af	3955eu	6005af	6180as
		6190af	6195eu	7120eu	9410eu
		9600af	9640na	11760me	12095va
		15070as	15310as	15400af	15420af
		15590va	17885af	21470af	21715as
		5975na	15280as	15575as	
0500-0530	Vatican Radio	7250eu	11625af	15090af	17730af
0500-0550	Germany, Deutsche Welle	5960na	6130na	9515na	9670na
		11705na	11925na	13610na	13790na
0500-0600	Australia	15240pa	15365pa	17630as	17715pa
		17750as	17795pa	21525as	21740as
		21775as			
0500-0600	Australia, ABC Brisbane	4920do	9660do		
0500-0600	Australia, ABC Perth	9610do			
0500-0600	Bahrain Broadcasting Svc	6010me			
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0600	China, Radio Beijing	11840am			
0500-0600	Cook Islands	11760pa			
0500-0600	Costa Rica, RFPI	7375na	15030na	21465na	
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0600 sa	Eq.Guinea, R.East Africa	9585af			
0500-0600 varies	Italy, IRRS Milan, Italy	7125eu			
0500-0600	Japan NHK	11870na	15195na	17765na	17810na
		17825na	17890na	21610na	
0500-0600	Kenya, Voice of	4935do			
0500-0600	Luxembourg, RTL	15350va			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600 mtwhf	Namibia BC Corp, Windhoek	3270af	3290af		
0500-0600	New Zealand, RNZI	17770pa			
0500-0600	Nigeria	3326do	4770do	4990do	7255af
0500-0600	Russia, Radio Moscow	12050na	13665na	15405na	15425na
		17605na			
0500-0600	Sierra Leone, SLBS	3316do			
0500-0600	Singapore, SBC1	5052do	11940do		
0500-0600	South Africa, Radio RSA	9695af			
0500-0600	Spanish National Radio	9530na			
0500-0600	Thailand	4830as	9655as	11905as	
0500-0600	USA, CSMonitor Boston	9455na	9840af	9870na	13760na
		17780as	17555as		
0500-0600	USA, KTBN Salt Lake City	7510am			
0500-0600	USA, KVOH Los Angeles	9785am			
0500-0600	USA, VOA Washington	5995eu	6040me	6060eu	6140me
		6873eu	7170me	7200me	9670me
		9700eu	9715me	11815me	11825me
		15205me			
0500-0600	USA, WHRI Noblesville	7315na			
0500-0600	USA, WINB Red Lion, Penn.	15145eu			
0500-0600	USA, WJCR Upton, Kentucky		7490na		
0500-0600 mtwhfa	USA, WMLK Bethel, Penna.	9465eu			
0500-0600	USA, WWCR Nashville	5920na	7435na		
0500-0600	USA, WYFR Okeechobee, FL	5985am	9850eu	11915eu	13695af
0500-0600	Zambia, Radio 2, Lusaka	6165do	7235do		
0500-0600 s	Zambia,Radio Zambia Int'l	9505af	11880af	17895af	
0510-0515 w,vl	Botswana, Gaborone	5955af	7255af		
0510-0600 vl	South Africa,Radio Oranje	9630do			
0518-0559 mtwhf	Canada, RCI Montreal	6050eu	6150eu	7295eu	9750eu
		11775me	17840me		
0520-0530	Finland, YLE	6120va	9665va	11755va	15440va
0524-0600 f	Ghana, Radio 2, Accra	3366do			
0526-0600	Ghana, Radio 1, Accra	4915do			
0530-0600	Austria, ORF Vienna	6015na	6155eu	13730eu	21490me
0530-0600	Cameroon CRTV Yaounde	4850do			
0530-0600	Romania, R.Romania Int'l	15340af	15380af	17720af	17745af
		17790af	21665af		
0530-0600	Swaziland, TWR Swaziland	5965af	11750af		
0530-0600	UAE Radio, Dubai	15435as	17830as	21700as	
0530-0600	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180as	6190af	6195eu	7120eu
		9410eu	9600af	9640na	11760me
		12095va	15070as	15280as	15310as
		15400af	15420af	15575af	21470af
0530-0600	United Kingdom,BBC London	21470af	21715as		
0545-0600	Cameroon CRTV Beau	3970do			

SELECTED PROGRAMS

Sundays
0509 Deutsche Welle: Commentary. See S 0109.
0513 Radio Australia: Back Page. See S 0313.
0517 Deutsche Welle: Feature. See S 0117.
0530 Radio Australia: Interaction. Patti Orofino explores the experiences of multicultural Australia.
0534 Deutsche Welle: German By Radio. See S 0134.

Mondays
0509 Deutsche Welle: Commentary. See S 0109.
0513 Radio Australia: Music Of Radio Australia. See S 1113.
0516 Deutsche Welle: Living in Germany. See M 0116.
0530 Radio Australia: Music/Information. See S 0330.
0534 Deutsche Welle: Larry's Random Selection. See M 0134.

Tuesdays
0509 Deutsche Welle: European Journal. See M 0209.
0513 Radio Australia: Music Of Radio Australia. See S 1113.
0530 Radio Australia: Points Of Law. See M 1530.
0534 Deutsche Welle: Transatlantic Diary. See T 0134.

Wednesdays
0509 Deutsche Welle: European Journal. See M 0209.
0513 Radio Australia: Music Of Radio Australia. See S 1113.

24-year old Kang Jian is one of the youngest announcers in the English Department at Radio Beijing.

0530 Radio Australia: Connections. See S 1530.
0534 Deutsche Welle: Transatlantic Diary. See T 0134.

Thursdays
0509 Deutsche Welle: European Journal. See M 0209.
0513 Radio Australia: Music Of Radio Australia. See S 1113.
0530 Radio Australia: AgriNews. See T 1530.
0534 Deutsche Welle: Transatlantic Diary. See T 0134.

Fridays
0509 Deutsche Welle: European Journal. See M 0209.
0513 Radio Australia: Music Of Radio Australia. See S 1113.
0530 Radio Australia: Lane's Company. See T 1430.

Saturdays
0509 Deutsche Welle: European Journal. See M 0209.
0513 Radio Australia: Music Of Radio Australia. See S 1113.
0530 Radio Australia: Arts Roundabout. The arts in Australia, past and present.
0534 Deutsche Welle: Through German Eyes. See S 1513.

0600 UTC [2:00 AM EDT/11:00 PM PDT]

FREQUENCIES

0600-0610 s	Malawi B'casting Corp.	3381do				
0600-0625	Cameroon CRTV Yaounde	4850do				
0600-0625	Kenya, Voice of	4935do				
0600-0630	Laos, National Radio of	7116as				
0600-0630 s	Latvia, Radio Riga	5935eu				
0600-0630	Swiss Radio Int'l	15430af	15565af	21770af		
0600-0630	United Kingdom,BBC London	3955eu	6180eu	6190af	6195eu	
	7230eu 9410eu	9600af	11760me	11940af	11955as	
	12095eu 15070va	15310as	15400af	15420af	15590va	
	17790as 17830as	17885af	21470af			
	5975na 7150pa	9640va	15280as	15360pa	15575as	
	21715as					
0600-0630	Vatican Radio	6245eu	7250eu			
0600-0630 s	Zambia,Radio Zambia Int'l	9505af	11880af	17895af		
0600-0640 last a	Lithuania, RadioCentras	9710eu				
0600-0645 s	Cameroon CRTV Douala	4795do				
0600-0650	Germany, Deutsche Welle	11780af	13610af	13790af	15185af	
		15205af	17875af			
0600-0650	North Korea	15180as	15230as			
0600-0700	Australia	15240pa	15365pa	17630as	17715pa	
	17750as 17795pa	21525as	21740pa	21775as		
0600-0700	Bahrain Broadcasting Svc	6010me				
0600-0700	Canada, CFCX Montreal	6005do				
0600-0700	Canada, CFRX Toronto	6070do				
0600-0700	Canada, CFVP Calgary	6030do				
0600-0700	Canada, CHNX Halifax	6130do				
0600-0700	Canada, CKZU Vancouver	6160do				
0600-0700	Cook Islands	11760pa				
0600-0700	Costa Rica, RFPI	7375na	15030na	21465na		
0600-0700	West NA Cuba, RHC Havana	11760na				
0600-0700	Czechoslovakia	6055va	7345va	9505va	11990va	
0600-0700	Ecuador, HCJB Quito	11925am	21455am			
0600-0700 sa	Eq.Guinea, R.East Africa	9585af				
0600-0700	Ghana, Radio 1, Accra	4915do				
0600-0700 f	Ghana, Radio 2, Accra	3366do				
0600-0700 varies	Italy, IRRS Milan, Italy	7125eu				
0600-0700	Lebanon, King of Hope	6280me				
0600-0700	Luxembourg, RTL	15350va				
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do				
0600-0700	Malaysia, Voice of	6175as	9750as	15295as		
0600-0700	Malta, V. of the Medit.	9765eu				
0600-0700	New Zealand, RNZI	17770pa				
0600-0700 s	New Zealand, ZLXA	3935do				
0600-0700	Nigeria	3326do	4990do	7255af		
0600-0700	Russia, AWR Russia	11855as				
0600-0700	Russia, Radio Moscow	4740do	4975do	6175va	7130va	
	7135va 7150am	7160va	7310va	9450va	9530va	
	9535va 9750va	9765va	9855va	11730va	11765va	
	11880va 11950na	12035va	12055va			
0600-0700	Sierra Leone, SLBS	3316do				
0600-0700	Singapore, SBC1	5010do	5052do	11940do		
0600-0700	South Africa, Radio RSA	15220af				
0600-0700 vl	South Africa,Radio Oranje	9630do				
0600-0700	South Korea, Seoul	7275om	11810na	15170na		
0600-0700	Swaziland, TWR Swaziland	5965af	7200af	11750af		
0600-0700 sa	Thailand	4830as	9655as	11905as		
0600-0700	USA, CSMonitor Boston	9455na	9840eu	9870am	17555as	
		17780as				
0600-0700	USA, KTBN Salt Lake City	7510na				
0600-0700	USA, KVOH Los Angeles	9785na				
0600-0700	USA, VOA Washington	3980eu	5995eu	6040eu	6060me	
	6110eu 6140eu	6873eu	7170me	7325me	11805me	
	11815me 11825me	11915me	15205me			
	6035af 6125af	7405af	9530af	9575af	15115af	
	17715af					
0600-0700	USA, WHRI Noblesville	7315eu				
0600-0700	USA, WJCR Upton, Kentucky		7490na			
0600-0700 smtwhf	USA, WMLK Bethel, Penna.	9465eu				
0600-0700	USA, WWCR Nashville	5920na	7435na			
0600-0700	USA, WYFR Okeechobee, FL	5985am	7355eu	9680eu	11725na	
		13695af				
0600-0700	Zambia, Radio 2, Lusaka	6165do	7235do			
0603-0610 tent	Croatian Radio, Zagreb	7240eu	9830eu	21480eu		
0615-0630 s	Cameroon CRTV Bertoua	4750do				
0615-0630	South Korea World News	7550eu	15575me			
0625-0700	Kenya, Voice of	4935do				
0630-0635 mtwhf	Congo, RTV Congolaise	7105do	9610do			
0630-0655	Belgium, BRT Brussels	5910au	11695eu			
0630-0700	Austria, ORF Vienna	6015na				
0630-0700	Monte Carlo, TWR	9480eu				
0630-0700 smtwhf	New Zealand, ZLXA	3935do				
0630-0700	United Kingdom,BBC London	5975na	6180eu	6190af	6195eu	
	7230eu 9410eu	9600af	9640pa	11760me	11940af	
	11955as 12095eu	15070va	15310as	15400af	15420af	
	15590va 17830as	17885af	21470af			
	7150pa 15280as	15360pa	17790as	21715as		
0630-0700	Vatican Radio	11625af	15090af	17730af		
0635-0700	Monaco, TWR Monaco	9480eu				
0645-0700	Finland, YLE	6120eu	9560af	11755eu		
0645-0700	Ghana B'casting Corp.	6130af				
0645-0700	Romania, R.Romania Int'l	11810au	11940au	15335au	17720au	
		17805au	21665au			
0645-0700	Romania, R.Romania Int'l	11810as	11940as	15335as	17720as	
		17805as	21665as			

SELECTED PROGRAMS

Sundays

0609 Deutsche Welle: Commentary. See S 0109.
0613 Deutsche Welle: Sports Report. See S 0213.
0615 BBC: Letter From America. Alistair Cooke.
0619 Deutsche Welle: International Talking Point. See S 0419.
0630 BBC: Jazz For The Asking. Digby Fairweather plays requests.
0630 Radio Australia: Fine Music Australia. See S 0230.
0634 Deutsche Welle: People and Places. See S 0434.
0636 BRT, Brussels: P.O. Box 26. Listener letters and questions.
0649 BRT, Brussels: Musical Roundabout. Music.

Mondays

0609 Deutsche Welle: European Journal. See M 0209.
0615 BBC: Recording Of The Week. New classical music releases.
0630 BBC: Feature. See S 1401.
0630 Radio Australia: This Australia. See S 0430.
0634 BRT, Brussels: Press Review. Stories in the Belgian press.
0634 Deutsche Welle: Africa in the German Press. See M 0434.
0637 BRT, Brussels: Radio World. Frans Vossen presents news for shortwave enthusiasts.
0647 BRT, Brussels: Tourism In Flanders.

Tuesdays

0609 Deutsche Welle: European Journal. See M 0209.
0615 BBC: The World Today. See M 1645.
0630 BBC: Rock/Pop Music. Paul Jones returns to present jazz, gospel, and more on "Counterpoint" (through August 11th).
0630 Radio Australia: Music Of Radio Australia. See S 1113.
0634 BRT, Brussels: Press Review. See M 0634.
0634 Deutsche Welle: Africa Report. See T 0434.
0637 BRT, Brussels: Belgium Today. See M 2337.
0642 BRT, Brussels: Focus On Europe. See M 2342.
0647 BRT, Brussels: Sports. See M 2347.

Wednesdays

0609 Deutsche Welle: European Journal. See M 0209.
0615 BBC: The World Today. See M 1645.
0630 BBC: Meridian. Events in the world of the arts.
0630 Radio Australia: Pacific Women.
0634 BRT, Brussels: Press Review. See M 0634.
0634 Deutsche Welle: Africa Report. See T 0434.
0637 BRT, Brussels: Belgium Today. See M 2337.
0642 BRT, Brussels: Around The Arts. See T 2342.
0647 BRT, Brussels: P.O. Box 26. See S 0636.

Thursdays

0609 Deutsche Welle: European Journal. See M 0209.
0615 BBC: The World Today. See M 1645.
0630 BBC: Sports International. See H 0230.
0630 Radio Australia: At Your Request. See S 0130.
0634 BRT, Brussels: Press Review. See M 0634.
0634 Deutsche Welle: Africa Report. See T 0434.
0637 BRT, Brussels: Belgium Today. See M 2337.
0642 BRT, Brussels: Living In Belgium. See W 2342.
0647 BRT, Brussels: Green Society. See W 2347.

Fridays

0609 Deutsche Welle: European Journal. See M 0209.
0615 BBC: The World Today. See M 1645.
0630 BBC: Meridian. See W 0630.
0630 Radio Australia: Music Of Radio Australia. See S 1113.
0634 BRT, Brussels: Press Review. See M 0634.
0634 Deutsche Welle: Africa Report. See T 0434.
0637 BRT, Brussels: Belgium Today. See M 2337.
0642 BRT, Brussels: Economics. See H 2342.
0650 BRT, Brussels: North-South. See H 2350.

Saturdays

0609 Deutsche Welle: Commentary. See S 0109.
0615 BBC: The World Today. See M 1645.
0623 Deutsche Welle: Panorama. See A 0223.
0630 BBC: Meridian. See W 0630.
0630 Radio Australia: Just Out. See M 0030.
0633 BRT, Brussels: Press Review. See M 0634.
0634 Deutsche Welle: Man and Environment. See T 0234.
0635 BRT, Brussels: Radio World. See M 0637.
0643 BRT, Brussels: Tourism In Flanders. See M 0647.
0650 BRT, Brussels: Record Of The Week. Musical excerpts from a selected Belgian record.
0653 BRT, Brussels: P.O. Box 26. See S 0636.

English language

shortwave guide

0700 UTC — 3:00 AM EDT/12:00 AM PDT]

0700-0710	Cameroon CRTV Bafoussam		4000do		
0700-0710 w	Malawi B'casting Corp.	3381do	5995do		
0700-0715	Romania, R.Romania Int'l	11810au	11940au	15335au	17720au
		17805au	21665au		
0700-0730	Australia	15170pa	15240pa	15320va	15365pa
		17630as	17715pa	17750as	17795pa
		21525as	21740pa	21775as	
0700-0730	Ecuador, HCJB Quito	9585eu	11730eu	15270eu	21455eu
0700-0730	United Kingdom,BBC London	5975na	7150pa	9640va	11955as
		15280as	15360pa	21715as	
		6180eu	6190af	6195eu	7230eu
		7325af	9410eu	9760eu	11760me
		11940af	12095eu	15070eu	15310as
		15400af	15420af	15575as	17640va
		17790as	17885af	21470af	21660af
0700-0750	North Korea	15350as	17765as		
0700-0800	Bahrain Broadcasting Svc	6010me			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Cook Islands	11760pa			
0700-0800	Costa Rica, RFPI	7375na	15030na	21465na	
0700-0800	West NA Cuba, RHC Havana	11760na			
0700-0800 sa	Eq.Guinea, R.East Africa	9585af			
0700-0800	Ghana B'casting Corp.	6130af			
0700-0800	Ghana, Radio 1, Accra	4915do			
0700-0800 f	Ghana, Radio 2, Accra	3366do			
0700-0800 varies	Italy, IRRS Milan, Italy	7125eu			
0700-0800	Japan NHK	15250me	17765eu	17810as	17860as
		21525as			
0700-0800	Kenya, Voice of	4935do			
0700-0800	Lebanon, King of Hope	6280me			
0700-0800 tent	Liberia, ELBC Monrovia	7275do			
0700-0800	Luxembourg, RTL	15350va			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800	Monaco/Monte Carlo, TWR	9480eu			
0700-0800	Monte Carlo, TWR	9480eu			
0700-0800	New Zealand, RNZI	17770pa			
0700-0800 smtwhf	New Zealand, ZXLA	3935do			
0700-0800	Nigeria	3326do	4990do		
0700-0800	Russia, Radio Moscow	4740do	4950do	4975do	5960do
		7130do	7160do	7310am	9855va
		11705va	11765va	11880va	11975va
		12010va	12055va	13705va	15280na
		15295va	15345va	15350va	15375va
0700-0800	Sierra Leone, SLBS	3316do			
0700-0800	Singapore, SBC1	5010do	5052do	11940do	
0700-0800 vl	South Africa,Radio Oranje	9630do			
0700-0800	Swaziland, TWR Swaziland	7200af	11750af		
0700-0800	Taiwan, V. of Free China,	5950na			
0700-0800 sa	Thailand	4830as	9655as	11905as	
0700-0800	USA, CSMonitor Boston	9445na	9840eu	9870am	17555as
		17780as			
0700-0800	USA, KTBN Salt Lake City	7510na			
0700-0800	USA, KVOH Los Angeles	9785na			
0700-0800	USA, WHRI Noblesville	7315eu			
0700-0800	USA, WJCR Upton, Kentucky		7490na		
0700-0800 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
0700-0800	USA, WWCR Nashville	5920am	7435am		
0700-0800	USA, WYFR Okeechobee, FL	9850af	11915af	13695eu	15566na
0700-0800	Zambia, Radio 2, Lusaka	6165do	7235do		
0703-0800 s	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
0705-0800 a	Cameroon CRTV Douala	4795do			
0730-0745 mtwhf	Icelandic National Radio	9265om			
0730-0745 mtwhfa	Vatican Radio	6245do	7250do	9645na	15210na
0730-0800	Australia	11880pa	15170va	15240pa	15320va
		15365pa	17630as	17715pa	17750as
		17795pa	21525as	21775as	
0730-0800	Czechoslovakia	17725pa	21705as		
0730-0800	Ecuador, HCJB Quito	9585eu	9745au	11730eu	11925au
		15270eu	21455va		
0730-0800	Netherlands	9630pa	11895pa		
0730-0800	United Kingdom,BBC London	6180eu	6190af	7325eu	9410eu
		9600af	9760eu	11760me	11860af
		11940af	12095va	15070eu	15105af
		15400af	15420af	15590af	17640va
		17830as	17885af	21470af	21660af
		7150pa	9640va	11955as	15280as
		15310as	15360pa	17790as	21715as

0800 UTC — [4:00 AM EDT/1:00 AM PDT]

0800-0803 daily	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
0800-0810	Cameroon CRTV Bafoussam		4000do		
0800-0810 w	Malawi B'casting Corp.	3381do			
0800-0825	Finland, YLE	17800as	21550as		
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0825	Netherlands	9630pa	11895pa		
0800-0825	Swaziland, TWR Swaziland	7200af	11750af		
0800-0830	Australia	6080pa	15240pa	17630as	17715pa
		17750as	21725as		
0800-0830	Bangladesh, V. of Islam	15195as	17815as		
0800-0830	Ecuador, HCJB Quito	9585eu	9745au	11730eu	11925au
		21455va			
0800-0830	United Kingdom,BBC London	6180eu	6190af	7325eu	9410eu
	9600af 9760eu	11760me	11860af	12095eu	15070eu
	15310as 15360pa	15400af	15420af	15590me	17790as
	17830as 17885af	21470af	21660af		
	7150pa 9640pa	9660eu	11950af	11955as	15105af
	15280as 17640va	21715as			
0800-0835	Monaco, TWR Monaco	9480eu			
0800-0835	Monte Carlo, TWR	9480eu			
0800-0845	Pakistan	17902eu	21520eu		
0800-0850	North Korea	15180as	15230as		
0800-0900	Australia, ABC Brisbane	9660do			
0800-0900	Australia, ABC Perth	15425va			
0800-0900	Bahrain Broadcasting Svc	6010me			
0800-0900 a	Cameroon CRTV Douala	4795do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Cook Islands	11760pa			
0800-0900	Costa Rica, RFPI	7375na	15030na	21465na	
0800-0900 sa	Eq.Guinea, R.East Africa	9585af			
0800-0900	Ghana, Radio 1, Accra	4915do			
0800-0900 f	Ghana, Radio 2, Accra	3366do			
0800-0900 asmtwh	Guam, KTWR Guam	15200as			
0800-0900	Indonesia, Voice of	7125as	9675as	11752as	11785as
0800-0900 varies	Italy, IRRS Milan, Italy	7125eu			
0800-0900	Kenya, Voice of	4935do			
0800-0900	Lebanon, King of Hope	6280me			
0800-0900	Luxembourg, RTL	15350va			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0900	New Zealand, RNZI	9700pa			
0800-0900 smtwhf	New Zealand, ZXLA	3935do			
0800-0900	Nigeria	3326do	4990do		
0800-0900	Nigeria, Voice of	7255af			
0800-0900	Papua New Guinea	4890do			
0800-0900 tent	Russia, Radio Moscow	4740do	4940do	4975do	5960do
	7130do 7160do	7310am	9535va	11705va	11765va
	11920va 11975va	12010va	12055va	13705va	15295va
	15345va 15350va	15420va	15435va		
0800-0900	Sierra Leone, SLBS	3316do	5980do		
0800-0900	Singapore, SBC1	5010do	5052do	11940do	
0800-0900 vl	South Africa,Radio Oranje	9630do			
0800-0900	South Korea, Seoul	7550eu	13670eu		
0800-0900	USA, CSMonitor Boston	9445am	11705eu	13615as	15665pa
		17555as			
0800-0900	USA, KNLS Anchor Point	7365as			
0800-0900	USA, KTBN Salt Lake City	7510am			
0800-0900	USA, VOA Washington	11735eu	15160eu	15195me	21455me
		21570me			
0800-0900	USA, WHRI Noblesville	7315eu	7355sa		
0800-0900	USA, WJCR Upton, Kentucky		7490na		
0800-0900 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
0800-0900	USA, WWCR Nashville	692am	5920na		
0800-0900	Zambia, Radio 2, Lusaka	6165do	7235do		
0803-0810 tent	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
0803-0900 s	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
0830-0845	Vatican Radio	6245eu	7250eu	9645eu	15210eu
0830-0900	Australia	6080pa	9 580pa	9710va	15240pa
		17630as	17750as	21725as	21775as
0830-0900	Austria, ORF Vienna	6155eu	13730eu	15450au	21490as
0830-0900	Ecuador, HCJB Quito	9745au	11925au	15270eu	21455au
0830-0900	Finland, YLE	15355as	17800as		
0830-0900	Italy, AWR Italy	7230eu			
0830-0900	Netherlands	9630pa	11895pa		
0830-0900	United Kingdom,BBC London	6180eu	6190eu	7325eu	9410eu
	9660eu 9760eu	11860af	11940af	11955as	12095eu
	15070va 15280as	15360pa	15400af	15420af	15590me
	17640va 17830as	21660af	21715as	17885af	
0835-0850 mtwhf	Monaco, TWR Monaco	9480eu			
0835-0850 smtwhf	Monte Carlo, TWR	9480eu			
0835-0850 mtwhf	Swaziland, TWR Swaziland	7200af	11750af		
0850-0900 s	Monaco, TWR Monaco	9480eu			
0850-0900 s	Monte Carlo, TWR	9480eu			

0900 UTC [5:00 AM EDT/2:00 AM PDT]

0900-0903 s	Croatian Radio, Zagreb	7240eu	9830eu	21480eu		
0900-0905	Ghana, Radio 1, Accra	4915do				
0900-0905 f	Ghana, Radio 2, Accra	3366do				
0900-0910	Malawi B'casting Corp.	5995do				
0900-0912 f	Guam, KTWR Guam	15200as				
0900-0915	Lebanon, Radio Voice of	6550me				
0900-0915 s	Monaco, TWR Monaco	9480eu				
0900-0915 s	Monte Carlo, TWR	9480eu				
0900-0925 mtwhf	Belgium, BRT Brussels	9905eu	13675eu			
0900-0925	Netherlands	9630pa	11895pa			
0900-0930	Costa Rica, RFPI	7375na	15030na	21465na		
0900-0930 asmtwf	Guam, KTWR Guam	15200as				
0900-0930 mtwhf	New Zealand, ZLXA	3935do				
0900-0930	Swiss Radio Int'l	9560as	13685as	17670as	21770as	
0900-0930	United Kingdom,BBC London	1170as	5975eu	6045eu	6180u	
	6190af 6195as	7325eu	9410eu	9660eu	9740as	
	9750eu 9760eu	11760me	11860af	11940af	12095eu	
	15070va 15400af	17640va	21660af			
	15190sa 15280as	15310as	15360as	15420af	15575me	
	15590me 17705eu	17790af	17830as	17885af	21470af	
	21660af 21715as					
0900-0950	Germany, Deutsche Welle	6160as	9565af	11915as	15410af	
	17780as 17820as	21465as	21600af	21650as	21680as	
0900-1000	Australia	6080pa	9580pa	9710va	13605as	
		15170as	21725as			
0900-1000	Australia, ABC Brisbane	9660pa				
0900-1000	Bahrain Broadcasting Svc	6010me				
0900-1000 s	Bhutan Broadcasting Svc	6035do				
0900-1000	Canada, CFCX Montreal	6005do				
0900-1000	Canada, CFRX Toronto	6070do				
0900-1000	Canada, CFVP Calgary	6030do				
0900-1000	Canada, CHNX Halifax	6130do				
0900-1000	Canada, CKZU Vancouver	6160do				
0900-1000	China, Radio Beijing	8450au	11755au	15440au	17710au	
0900-1000	Cook Islands	11760pa				
0900-1000	Ecuador, HCJB Quito	9745au	11925au	21455au		
0900-1000 sa	Eq.Guinea, R.East Africa	9585af				
0900-1000	Guam, KTWR Guam	11805as				
0900-1000 s	Italy, AWR via Portugal	9670eu				
0900-1000 varies	Italy, IRRS Milan, Italy	7125eu				
0900-1000	Japan NHK	15270au	17890au			
0900-1000	Japan NHK	11840as	21610as			
0900-1000	Kenya, Voice of	4935do				
0900-1000	Lebanon, King of Hope	6280me				
0900-1000	Luxembourg, RTL	15350va				
0900-1000	Malaysia, RTM Radio 4	7295do				
0900-1000	New Zealand, RNZI	9700pa				
0900-1000	Nigeria	3326do	4990do			
0900-1000	Nigeria, Voice of	7255af				
0900-1000	Papua New Guinea	4890do				
0900-1000	Philippines, FEBC Manila	9800as	11685as			
0900-1000	Russia, Radio Moscow	4740do	4940do	4975do	6000am	
	7130am 7245va	9535va	9780va	9855va	11705va	
	11765va 11920va	11975va	12055va	13705va	15175va	
	15280va 15295va	15345va	15545na			
0900-1000	Sierra Leone, SLBS	3316do				
0900-1000	Singapore, SBC1	5010do	5052do	11940do		
0900-1000 vl	South Africa,Radio Oranje	9630do				
0900-1000	Tanzania	5985af	9685af	11765af		
0900-1000	USA, CSMonitor Boston	9445am	11705eu	13615pa	15665pa	
		17555as				
0900-1000	USA, KTBN Salt Lake City	7510am				
0900-1000	USA, VOA Washington	11735eu	15160eu	15195me	21455me	
		21570eu				
0900-1000	USA, WJCR Upton, Kentucky		7490na			
0900-1000 smtwhf	USA, WMLK Bethel, Penna.	9465eu				
0900-1000	USA, WWCR Nashville	5920am	7435am			
0900-1000	Zambia, Radio 2, Lusaka	6165do	7235do			
0905-1000	Cameroon CRTV Yaounde	4850do				
0905-1000 sa	Ghana, Radio 1, Accra	4915do				
0905-1000 mtwhf	Ghana, Radio 2 School prg	7295do				
0905-1000 sa	Ghana, Radio 2, Accra,	3366do				
0910-0940 smwha	Mongolia, Ulaanbaatar	11850pa	12015pa			
0915-0930	South Korea World News	9570am	13670eu			
0930-0940	Togo, RTV Togo	7265do				
0930-1000	Afghanistan, Kabul	9635as				
0930-1000	Netherlands	9630pa	11895pa			
0930-1000	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af	
	6195as 9410eu	9660eu	9740as	9750eu	9760eu	
	11750as 11760me	11940af	12095eu	15070va	15310as	
	15400af 15420af	15575me	15590me			
	15190sa 17640va	17705eu				
0940-0950	Greece, Voice of	17525eu				
0950-0953 a	Russia, Vladivostok	4050do	4485do	5015do	5905do	
	6035do 6175pa	7175pa	7210pa	7260pa	7270pa	
	7345pa 9530pa	9600pa	9635pa	9825pa	9905pa	
	11815pa 15535pa	15595pa	17620pa	17695pa	17825pa	
	17850pa					

1000 UTC [6:00 AM EDT/3:00 AM PDT]

1000-1025	Netherlands	9630pa	11895pa		
1000-1030 tent	Afghanistan, Kabul	9635as			
1000-1030	Israel, Kol Israel	17545eu			
1000-1030	Tanzania	5985af	9685af	11765af	
1000-1030	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af
	6195as 9410eu	9660eu	9740as	9750eu	9760eu
	11750as 11760me	11940af	12095eu	15070va	15190sa
	15310as 15400af	15420af	15575me	17640eu	17705eu
	17790af 17885af	21470af	21660af	21715as	
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1000-1100	Australia	6080pa	9580pa	9710va	11880pa
		13605pa	21725as		
1000-1100	Bahrain Broadcasting Svc	6010me			
1000-1100	Cameroon CRTV Yaounde	4850do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, Radio Beijing	8450au	11755au	15440au	17710au
1000-1100	Cook Islands	11760pa			
1000-1100	Costa Rica, AWR	9725ca			
1000-1100	Costa Rica, RFPI	7375na	15030na	21465na	
1000-1100	Ecuador, HCJB Quito	9745au	11925au	21455au	
1000-1100 sa	Eq.Guinea, R.East Africa	9585af			
1000-1100 sa	Ghana, Radio 1, Accra	4915do			
1000-1100 mtwhf	Ghana, Radio 2 School Prg	7295do			
1000-1100 sa	Ghana, Radio 2, Accra	3366do			
1000-1100	India, All India Radio	15050as	17387as	17895as	21735as
1000-1100 varies	Italy, IRRS Milan, Italy	7125eu			
1000-1100	Kenya, Voice of 4935do				
1000-1100	Luxembourg, RTL	15350va			
1000-1100	Malaysia, RTM Kuching	7160do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100	New Zealand, RNZI	9700pa			
1000-1100	Nigeria	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1100	Philippines, FEBC Manila	9800as	11665as		
1000-1100	Russia, Radio Moscow	9455na	9495na	11840na	15485na
1000-1100	Sierra Leone, SLBS	3316do			
1000-1100	Singapore, SBC1	5010do	5052do 1	1940do	
1000-1100	South Africa, Radio RSA	11900af			
1000-1100 vl	South Africa,Radio Oranje	9630do			
1000-1100	USA, CSMonitor Boston	9455am	9495na	13625as	17555as
1000-1100 sa	USA, CSMonitor Boston	15665me			
1000-1100	USA, VOA Washington	5985as	11720au	15425au	
1000-1100	USA, WHRI Noblesville	7315na			
1000-1100	USA, WJCR Upton, Kentucky		7490na		
1000-1100	USA, WWCR Nashville	5920am	15690na		
1000-1100	USA, WYFR Okeechobee, FL		5950am		
1000-1100	Zambia, Radio 2, Lusaka	6165do	7235do		
1030-1040 mtwhf	Malawi B'casting Corp.	5995do			
1030-1100	Czechoslovakia	6055va	7345va	9505va	11990va
1030-1100	Iran, Islamic Republic	9525as	11715af	11790as	11910as
		11930me			
1030-1100	South Korea, Seoul	11715na			
1030-1100	Sri Lanka B'casting Corp.	11835as	15120as	17850as	
1030-1100 sa	Tanzania	5985af	9685af	11765af	
1030-1100	UAE Radio, Dubai	13675eu	15320eu	15435as	21605as
1030-1100	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af
	6195as 9410eu	9660eu	9740as	9750eu	9760eu
	11750as 11760me	11940af	12095eu	15070va	15190sa
	15310as 15400af	15420af	15575me		
	17640va 17705eu	17790af	17885af	21470af	21660af
1030-1100	Zambia,Radio Zambia Int'l	9505af	11880af	17895af	
1040-1050	Greece, Voice of	15650as	17525as		
1055-1100	Bonaire, TWR Bonaire	11815am	15345am		

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shortwave guide

1100 UTC [7:00 AM EDT/4:00 AM PDT]

FREQUENCIES

1100-1110 mtwhf	Ghana, Radio 2 School Prg	7295do			
1100-1110 sa	Malawi B'casting Corp.	5995do			
1100-1120	Pakistan	17902eu	21520eu		
1100-1130	Ecuador, HCJB Quito	9745au	11925au	21455au	
1100-1130	Iran, Islamic Republic	9525af	11515af	11790as	11910as
			11930me		
1100-1130 irreg	Mozambique	9525af	11818af	11835af	
1100-1130	Sri Lanka B'casting Corp.	11835as	15120as	17850as	
1100-1130	Swiss Radio Int'l	13635as	15505as	17670as	21770as
1100-1130	United Kingdom,BBC London	5965na	6045eu	6180eu	6190af
		6195eu	9410eu	9515na	9660eu
		9740as	9750eu	9760eu	11750as
		11760me	11940af	12095eu	15070va
		15310as	15400af	15420af	15575me
		15220na	17640va	17705eu	17790af
		17885af	21470af	21660af	
1100-1130	Vietnam, Voice of	9840as	12020as	15010as	
1100-1150	Germany, Deutsche Welle	15410af	17765af	17800af	17860af
		21600af			
1100-1150	North Korea	6576na	9977na	11335na	
1100-1200	Australia	6020pa	6080pa	7240pa	9580pa
		9710va	11880pa	13605pa	21725as
1100-1200	Bahrain Broadcasting Svc	6010me			
1100-1200	Bonaire, TWR Bonaire	11815am	15345am		
1100-1200	Bulgaria, Radio Sofia	11630af			
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Cook Islands	11760pa			
1100-1200	Costa Rica, AWR	9725ca	11870ca		
1100-1200	Costa Rica, RFPI	7375na	15030na	21465na	
1100-1200	Czechoslovakia	6055va	7345va	9505va	11990va
1100-1200	Ghana, Radio 1, Accra	4915do			
1100-1200 sa	Ghana, Radio 2, Accra	3366do			
1100-1200 varies	Italy, IRRS Milan, Italy	7125eu			
1100-1200	Japan NHK	6120na	11815sa	11840na	
1100-1200	Luxembourg, RTL	15350va			
1100-1200	Malaysia, RTM Kuching	4950do	7160do		
1100-1200	Malaysia, RTM Radio 4	7295do			
1100-1200	New Zealand, RNZI	9700as			
1100-1200	Russia, Radio Moscow	9600na	11840na	12055na	15485na
		17830na			
1100-1200	Singapore, SBC1	5010do	5052do	11940do	
1100-1200	South Africa, Radio RSA	11900af			
1100-1200 vl	South Africa,Radio Oranje	9630do			
1100-1200	South Korea World News	15575af			
1100-1200	USA, CSMonitor Boston	9455am	9495na	13625as	17555as
1100-1200 sa	USA, CSMonitor Boston	15665me			
1100-1200	USA, KTBN Salt Lake City	7510na			
1100-1200	USA, VOA Washington	5985as	6110au	9760as	11720au
		15155au	15425as	21640as	
1100-1200	USA, WHRI Noblesville	7315na	9465na		
1100-1200	USA, WJCR Upton, Kentucky		7490na		
1100-1200	USA, WWCR Nashville	12160na	15690na		
1100-1200	USA, WYFR Okeechobee, FL		5950am	7355am	
1115-1130	South Korea World News	7275as	11740as		
1115-1145	Nepal, Kathmandu	3230as	5005as	7165as	
1120-1130	Vatican Radio	6245do	7250do	9645do 1	5210do
1125-1130 sa	Botswana, Gaborone	5955af	7255af		
1125-1150 mtwhf	Finland, YLE	15400na			
1130-1140	Lesotho, Masseru	4800do			
1130-1155 s	Belgium, BRT Brussels	17555va	21810na		
1130-1200	Austria, ORF Vienna	6155eu	11780as	13730va	15450as
1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1130-1200	Italy, AWR Italy	7230eu			
1130-1200	South Korea, Seoul	9650na			
1130-1200	Thailand	4830as	9655as	11905as	
1130-1200	United Kingdom,BBC London	5965na	6045eu	6180eu	6190af
		6195eu	9410eu	9515na	9660eu
		9740as	9750eu	9760eu	11750as
		11760me	11940af	12095eu	15070va
		15220na	15310as	15420af	15575me
		17640va	17705eu	17790af	17885af
		21470af			
1130-1200	Yugoslavia, Radio Facist	17710as	17740am	21605pa	
1145-1200	Burundi, RTV	6140af			

SELECTED PROGRAMS

Sundays

1109 Deutsche Welle: Arts on the Air. Reports and interviews on cultural events and developments.
1113 Radio Australia: Music Of Radio Australia. Selections by Radio Australia announcers.
1115 Radio Korea: Echoes Of Korean Music.
1130 BBC: The Ken Bruce Show. See S 0030.
1130 Radio Australia: One World. Michael Wagner reports on environmental issues of the Asian/Pacific region.
1134 Deutsche Welle: German by Radio. See S 0134.
1135 Radio Korea: Shortwave Feedback. Listener letters, opinions, and suggestions.
1136 BRT, Brussels: P.O. Box 26. See S 0636.
1149 BRT, Brussels: Musical Roundabout. See S 0649.

Mondays

1109 Deutsche Welle: Newsline Cologne. A current affairs program with worldwide reports and a German press review.
1113 Radio Australia: Music Of Radio Australia. See S 1113.
1115 Radio Korea: News Commentary. See S 0015.
1120 Radio Korea: Seoul Calling. Music, features, and short interviews relating to Korea.
1130 BBC: Composer Of The Month. See M 0230.
1134 Deutsche Welle: Hello Africa. Musical requests and greetings to friends.
1140 Radio Korea: Tales From Korea's Past. The history of Korea.

Tuesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1113 Radio Australia: Music Of Radio Australia. See S 1113.
1115 Radio Korea: News Commentary. See S 0015.
1120 Radio Korea: Seoul Calling. See M 1120.
1130 BBC: Megamix. Music, sports, fashion, health, travel, news, and opinion for young people.
1130 Radio Australia: Business Horizons. Business and trade in the Asian/Pacific region.
1134 Deutsche Welle: Hello Africa. See M 1134.
1140 Radio Korea: Korean Cultural Variety. A look at Korean cultural and artistic traditions.

Wednesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1113 Radio Australia: Music Of Radio Australia. See S 1113.
1115 Radio Korea: News Commentary. See S 0015.
1120 Radio Korea: Seoul Calling. See M 1120.
1130 BBC: Meridian. See W 0630.
1130 Radio Australia: Science File. News about developments in science, medicine, and technology in Oceania.
1134 Deutsche Welle: Hello Africa. See M 1134.
1140 Radio Korea: Pulse Of Korea. Reports on the development of Korea.

Thursdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1113 Radio Australia: Music Of Radio Australia. See S 1113.
1115 Radio Korea: News Commentary. See S 0015.
1120 Radio Korea: Seoul Calling. See M 1120.
1130 BBC: Drama. Two youths escape — or try to — on "The Runaways" (2nd/9th); when a widow steps out into the "real world," it's "Mrs. Donaldson at 60" (through August 6th).
1130 Radio Australia: AgriNews. See T 1530.
1134 Deutsche Welle: Hello Africa. See M 1134.
1140 Radio Korea: Forward To Reunification. The prospects for reunion between North and South Korea.

Fridays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1113 Radio Australia: Music Of Radio Australia. See S 1113.
1115 Radio Korea: News Commentary. See S 0015.
1120 Radio Korea: Let's Sing Together. A sing-along program, featuring the always-popular Song of the Month.
1130 BBC: Meridian. See W 0630.
1130 Radio Australia: Connections. See S 1530.
1134 Deutsche Welle: Hello Africa. See M 1134.
1140 Radio Korea: Let's Learn Korean! Korean language lessons for native English speakers.

Saturdays

1109 Deutsche Welle: Africa This Week. A review of trends and events on the African continent.
1113 Radio Australia: Music Of Radio Australia. See S 1113.
1115 Radio Korea: News Commentary. See S 0015.
1120 Radio Korea: Sites And Sounds. See S 0020.
1130 BBC: Meridian. See W 0630.
1130 Radio Australia: Matters Of Faith. See M 0430.
1134 Deutsche Welle: Mailbag Africa. Listeners' questions, music requests, and the club corner.
1135 Radio Korea: From Us To You. See S 0035.

1200 UTC [8:00 AM EDT/5:00 AM PDT]

FREQUENCIES

1200-1205	New Zealand, RNZI	9700as			
1200-1210 w	Malawi B'casting Corp.	3381do	5995do		
1200-1215	Cambodia, Voice of	9695as	11938as		
1200-1225 sa	Ghana, Radio 2, Accra	3366do			
1200-1230	Bulgaria, Radio Sofia	11630af			
1200-1230 smwha	Mongolia, Ulaanbaatar	11850as	12015as		
1200-1230 as	Norway	17860as	21705as		
1200-1230	Somalia, Radio Mogadishu,	6095af			
1200-1230	Thailand	4830as	9655as 1	1905as	
1200-1230	United Kingdom,BBC London	6045eu	6180eu	6190af	6195eu
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070eu	5220na
		15310as	15420af	15575me	17640va
		17705eu	17790af	17840af	17885af
		21470af	21660af		
1200-1230	USA, VOA Washington	6110as	9760au	11715as	15155au
		15425as			
1200-1230	Uzbekhistan, R. Tashkent	5945as	9540as	15470as	17745as
1200-1230 s	Zambia,Radio Zambia Int'l	9505af	11880af	17895af	
1200-1255	Polish Radio Warsaw	6135eu	7145eu	9525eu	11815eu
1200-1300	Australia	6020pa	6080pa	7240pa	9580pa
		9710pa	21725as		
1200-1300	Australia, ABC Brisbane	4920au			
1200-1300	Australia, ABC Katherine	2485do			
1200-1300	Australia, ABC Perth	6140do	9610do		
1200-1300	Bahrain Broadcasting Svc	6010me			
1200-1300	Bonaire, TWR Bonaire	11815am	15345am		
1200-1300	Brazil, Radiobras	11745am			
1200-1300 mtwhf	Cameroon CRTV Douala	4795do			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300 mtwhf	Canada, RCI Montreal	9635am	11855am	17820am	
1200-1300	China, Radio Beijing	8425au	9665na	9715as	11600pa
		11660as	15450pa		
1200-1300	Cook Islands	11760pa			
1200-1300	Costa Rica, AWR	9725ca	11870ca		
1200-1300	Costa Rica, RFPI	15030na	21465na		
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17890am	21455om
1200-1300 sa	Eq.Guinea, R.East Africa	9585af			
1200-1300	Ghana, Radio 1, Accra	4915do			
1200-1300 varies	Italy, IRRS Milan, Italy	7125eu			
1200-1300	Kenya, Voice of	4935do			
1200-1300	Luxembourg, RTL	15350va			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1300	Nigeria	4990do	7285do		
1200-1300	Nigeria, Voice of	7255af			
1200-1300	Papua New Guinea	4890do			
1200-1300	Russia, Radio Moscow	9655na	9755na	11840na	11985na
		12050na	12055na	15280na	15485na
		17670na	17830na		
1200-1300	Sierra Leone, SLBS	3316do	5980do		
1200-1300	Singapore, SBC1	5010do	5052do	11940do	
1200-1300 vl	South Africa,Radio Oranje	9630do			
1200-1300 sa	Tanzania	5985af	9684af	11765af	
1200-1300	USA, CSMonitor Boston	9425au	9495am	13625as	13760na
1200-1300 as	USA, CSMonitor Boston	15665eu			
1200-1300	USA, KTBN Salt Lake City	7510am			
1200-1300	USA, WHRI Noblesville	7315am	9465am		
1200-1300	USA, WJCR Upton, Kentucky		7490na		
1200-1300	USA, WWCR Nashville	12160na	15690na		
1200-1300	USA, WYFR Okeechobee, FL		5950am	7355am	9705am
		11830am	17760am		
1203-1210 as	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
1215-1230	Cyprus, Radio Bayrak	6150va			
1215-1300	Egypt, Radio Cairo	17595as			
1215-1300	South Korea, Seoul	9750am			
1226-1300	Ghana, Radio 2, Accra	7295do			
1230-1255 mtwhf	Finland, YLE	15400na	17880na		
1230-1300	Bangladesh	15200as	15605as	15647as	17750as
1230-1300	France, RFI Paris	9805eu	11670eu	15195eu	15425eu
			21645na		
1230-1300	Netherlands	9855eu			
1230-1300	Sri Lanka B'casting Corp.	6075as	9720as		
1230-1300	Sweden	15170as	17740as		
1230-1300	United Kingdom,BBC London	6045eu	6180eu	6190af	6195ca
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11760me	11940af
		12095eu	12170as	15070eu	15220na
		15310as	15420af	15575me	17640va
		17705eu	17790af	17840af	17885af
		21470af	21660af		
1230-1300	USA, VOA Washington	6110as	9760au	11715au	15155as
		15425as			
1230-1300	Vietnam, Voice of	9840as	12020as	15010as	
1235-1245	Greece, Voice of	15635na	15650na	17515na	
1258-1300	Gabon, Africa Numero Un	9580af	17630af		

SELECTED PROGRAMS

Sundays

1201 BBC: Play Of The Week. See S 0101.
1227 Radio Australia: Tattslotto Results. And tonight's winning numbers are...
1230 Radio Australia: Soundabout. Young, contemporary music from Australia and around the world.
1230 Radio Korea: Echoes Of Korean Music. See S 1115.
1250 Radio Korea: Shortwave Feedback. See S 1135.

Mondays

1215 BBC: Quiz. Robert Robinson hosts the favorite general-knowledge game show "Brain Of Britain" (thru Oct. 4th).
1230 Radio Australia: Soundabout. See S 1230.
1230 Radio Korea: News Commentary. See S 0015.
1235 Radio Korea: Seoul Calling. See M 1120.
1245 BBC: Sports Roundup. See S 0315.
1255 Radio Korea: Tales From Korea's Past. See M 1140.

Tuesdays

1215 BBC: Multitrack 1: Top 20. See M 2330.
1230 Radio Australia: Soundabout. See S 1230.
1230 Radio Korea: News Commentary. See S 0015.
1235 Radio Korea: Seoul Calling. See M 1120.
1245 BBC: Sports Roundup. See S 0315.
1255 Radio Korea: Korean Cultural Variety. See T 1140.

Wednesdays

1215 BBC: New Ideas. See M 1615.
1227 Radio Australia: Tattslotto Results. See S 1227.
1230 Radio Australia: Soundabout. See S 1230.
1230 Radio Korea: News Commentary. See S 0015.
1235 BBC: Talks. See M 1635.
1235 Radio Korea: Seoul Calling. See M 1120.
1245 BBC: Sports Roundup. See S 0315.
1255 Radio Korea: Pulse Of Korea. See W 1140.

Thursdays

1215 BBC: Multitrack 2. See W 2330.
1230 Radio Australia: Soundabout. See S 1230.
1230 Radio Korea: News Commentary. See S 0015.
1235 Radio Korea: Seoul Calling. See M 1120.
1245 BBC: Sports Roundup. See S 0315.
1255 Radio Korea: Forward To Reunification. See H 1140.

Fridays

1215 BBC: Feature. Malcolm Billings travels to archeological digs to examine the world's cultural "Heritage" (3rd/10th); Jim Hiley examines "The Gay And Lesbian World" (thru Aug. 21st).
1230 Radio Australia: This Australia. See S 0430.
1230 Radio Korea: News Commentary. See S 0015.
1235 Radio Korea: Let's Sing Together. See F 1120.
1245 BBC: Sports Roundup. See S 0315.
1255 Radio Korea: Let's Learn Korean! See F 1140.

Saturdays

1215 BBC: Multitrack 3. See F 2330.
1227 Radio Australia: Tattslotto Results. See S 1227.
1230 Radio Australia: Women In Politics. See A 0330.
1230 Radio Korea: News Commentary. See S 0015.
1235 Radio Korea: Sites And Sounds. See S 0020.
1245 BBC: Sports Roundup. See S 0315.
1250 Radio Korea: From Us To You. See S 0035.

1300 UTC [9:00 AM EDT/6:00 AM PDT]

FREQUENCIES

1300-1315	South Korea, Seoul	9750na			
1300-1320	Brazil, Radiobras	11745am			
1300-1325	Belgium, BRT Brussels	17555va	21810na		
1300-1325	Kenya, Voice of	4935do			
1300-1325	Netherlands	9855eu			
1300-1330	Afghanistan, Kabul	9635as			
1300-1330	Bonaire, TWR Bonaire	11815am	15345am		
1300-1330 mtwhf	Cameroon CRTV Douala	4795do			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1330	Israel, Kol Israel	11587am	11605na	15590na	15640as
		15650as	17575eu	17590eu	
1300-1330 as	Norway	9590eu	15270af		
1300-1330	Swiss Radio Int'l	6165eu	7480as	9535eu	11690as
		12030eu	13635as	15505as	17670as
		21770as			
1300-1330	United Kingdom,BBC London	5965am	6045eu	6180eu	6190af
		6195ca	9410eu	9515na	9660eu
		9740as	9750eu	9760eu	11750as
		11760me	11820as	11940af	12095eu
		15070va	15310as	15420af	15575me
		7180as	15220na	17640va	17705eu
		17790af	17840af	17885af	21470af
		21660af			
1300-1330	USA, VOA Washington	6110as	9760au	11715as	15155au
		15425au			
1300-1350	North Korea	9325eu	9345eu	9640as	13650as
		13650am	15230as	15230am	
1300-1400	Australia	5995pa	6080pa	7240pa	9580pa
1300-1400	Australia, ABC Alice Sprg	2310do			
1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Katherine	2485do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, ABC Tennant Cr	2325do			
1300-1400	Bahrain Broadcasting Svc	6010me			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 s	Canada, RCI Montreal	11955am	17820am		
1300-1400	China, Radio Beijing	9715as	11660as	11660na	11855na
1300-1400	Cook Islands	11760pa			
1300-1400	Costa Rica, RFPI	15030na	21465na		
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1300-1400 sa	Eq.Guinea, R.East Africa	9585af			
1300-1400 as	Finland, YLE	15400na	17880na		
1300-1400	Ghana, Radio 1, Accra	4915do			
1300-1400	Ghana, Radio 2, Accra	7295do			
1300-1400	Luxembourg, RTL	15350va			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1400	Nigeria	4990do	7285do		
1300-1400	Nigeria, Voice of	7255af			
1300-1400	Papua New Guinea	4890do			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1400	Romania, R.Romania Int'l	11940eu	15365eu	17720eu	17850eu
1300-1400	Russia, AWR Russia	11855as			
1300-1400	Russia, Radio Moscow	9655na	9755na	11840na	11985na
		12050na	12055na	15485na	17670na
		17830na			
1300-1400	Sierra Leone, SLBS	3316do	5980do		
1300-1400	Singapore, SBC1	5010do	5052do	11940do	
1300-1400 vl	South Africa,Radio Oranje	9630do			
1300-1400	Sri Lanka B'casting Corp.	6075as	9720as		
1300-1400 sa	Tanzania	5985af	9684af	11765af	
1300-1400	USA, CSMonitor Boston	9425au	9495am	13625as	13760na
1300-1400 as	USA, CSMonitor Boston	15665eu			
1300-1400	USA, KNLS Anchor Point	7355as			
1300-1400	USA, KTBN Salt Lake City	7510			
1300-1400	USA, WHRI Noblesville	9465	11790		
1300-1400	USA, WJCR Upton, Kentucky		7490na		
1300-1400	USA, WWCR Nashville	12160na	15690		
1300-1400	USA, WYFR Okeechobee, FL		5960na	9705am	11550as
		11830am	13695na	17760am	
1315-1330	Lebanon, Radio Voice of	6549.5			
1320-1400	Jordan	9560eu			
1325-1400 mtwhf	Kenya, Voice of	4935do			
1330-1345	South Korea World News	7275as	11740as		
1330-1357	Canada, RCI Montreal	9535as	11795as		
1330-1400	Austria, ORF Vienna	11780as	15450as		
1330-1400	Cameroon CRTV Douala	4795do			
1330-1400	Finland, YLE	15400na	17880na		
1330-1400	India, All India Radio	9665as	11760as	15120as	
1330-1400 a	Indonesia,Radio Republik	3385do	6070do		
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands	17580pa	17605pa	21665pa	
1330-1400	UAE Radio, Dubai	13675eu	15320eu	15435as	21605as
1330-1400	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af
		6195ca	9410eu	9515na	9660eu
		9740as	9750eu	9760eu	11750as
		11820as	11940af	12095eu	15070va
		15220na	15310as	15420af	15575me
		7180as	17640va	17705eu	17790af
		17840af	17885af	21470af	21660af
1330-1400	USA, VOA Washington	6110as	9760as	15155au	15425au
1330-1400	Uzbekhistan, R.Tashkent	5945as	9540as	15470as	17745as
1330-1400	Vietnam, Voice of	9840as	12020as	15010as	
1345-1400	Vatican Radio	11640au	15090au	17525au	21515au

SELECTED PROGRAMS

Sundays

1313 Radio Australia: Sports Report. Results and reports on sporting events from the world over.
1330 Radio Australia: Fine Music Australia. See S 0230.

Mondays

1304 BRT, Brussels: Press Review. See M 0634.
1307 BRT, Brussels: Radio World. See M 0637.
1313 Radio Australia: Sports Report. See S 1313.
1317 BRT, Brussels: Tourism In Flanders. See M 0647.
1330 Radio Australia: Music Of Radio Australia. See S 1113.

Tuesdays

1304 BRT, Brussels: Press Review. See M 0634.
1307 BRT, Brussels: Belgium Today. See M 2337.
1312 BRT, Brussels: Focus On Europe. See M 2342.
1313 Radio Australia: Sports Report. See S 1313.
1317 BRT, Brussels: Sports. See M 2347.
1330 Radio Australia: Music Of Radio Australia. See S 1113.

Wednesdays

1304 BRT, Brussels: Press Review. See M 0634.
1307 BRT, Brussels: Belgium Today. See M 2337.
1312 BRT, Brussels: Around The Arts. See T 2342.
1313 Radio Australia: Sports Report. See S 1313.
1317 BRT, Brussels: P.O. Box 26. See S 0636.
1330 Radio Australia: Just Out. See M 0030.

Thursdays

1304 BRT, Brussels: Press Review. See M 0634.
1307 BRT, Brussels: Belgium Today. See M 2337.
1312 BRT, Brussels: Living In Belgium. See W 2342.
1313 Radio Australia: Sports Report. See S 1313.
1317 BRT, Brussels: Green Society. See W 2347.
1330 Radio Australia: Music Of Radio Australia. See S 1113.

Fridays

1304 BRT, Brussels: Press Review. See M 0634.
1307 BRT, Brussels: Belgium Today. See M 2337.
1312 BRT, Brussels: Economics. See H 2342.
1313 Radio Australia: Sports Report. See S 1313.
1320 BRT, Brussels: North-South. See H 2350.
1330 Radio Australia: Music Of Radio Australia. See S 1113.

Saturdays

1303 BRT, Brussels: Press Review. See M 0634.
1305 BRT, Brussels: Radio World. See M 0637.
1313 BRT, Brussels: Tourism In Flanders. See M 0647.
1313 Radio Australia: Sports Report. See S 1313.
1320 BRT, Brussels: Record Of The Week. See A 0650.
1323 BRT, Brussels: P.O. Box 26. See S 0636.
1330 Radio Australia: Music Of Radio Australia. See S 1113.

1400 UTC [10:00 AM EDT/7:00 AM PDT]

FREQUENCIES

1400-1410	Malawi B'casting Corp.	3381do			
1400-1410	Sudan, Radio Juba	9540do	9550do		
1400-1415	Vatican Radio	15090au	17525au	21515au	
1400-1425	Netherlands	17580pa	17605pa	21665pa	
1400-1430	Cameroon CRTV Douala	4795do			
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1400-1430	Malaysia, RTM Kuching	4950do			
1400-1430	United Kingdom,BBC London	6045eu	6180eu	6190af	6195af
		6195as	7180as	9410eu	9660eu
		9740as	9750eu	9760eu	11750as
		11820as	11940af	12095eu	15070eu
		15310as	15575me	17640va	17705eu
		17790af	17840	17880af	21470af
		21660af			
1400-1500	Australia	5995pa	6060pa	6080pa	7240pa
		9580pa	9770va	15170va	
1400-1500	Australia, VLW6 Wanneroo,	6140do			
1400-1500	Bahrain Broadcasting Svc	6010me			
1400-1500	Cameroon CRTV Yaounde	4850do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11955am	17820am		
1400-1500	China, Radio Beijing	4200as	11815as	11855na	15165as
1400-1500	Cook Islands	11760pa			
1400-1500	Costa Rica, RFPI	15030am	21465am		
1400-1500	France, RFI Paris	11910as	17650as	17690as	
1400-1500	Ghana, Radio 1, Accra	4915do			
1400-1500	Ghana, Radio 2, Accra	7295do			
1400-1500	India, All India Radio	9665as	11760as	15120as	
1400-1500 varies	Italy, IRRS Milan, Italy	7125eu			
1400-1500	Japan NHK	9505am	11865va		
1400-1500	Jordan	9560eu			
1400-1500 mtwhf	Kenya, Voice of	4935do			
1400-1500	Lebanon, King of Hope	6280me			
1400-1500	Luxembourg, RTL	15350va			
1400-1500	Malaysia, RTM Radio 4	7295do			
1400-1500	Malta, V. of the Medit.	11925eu			
1400-1500	Nigeria	4990do	7285do		
1400-1500	Nigeria, Voice of	7255af			
1400-1500	Philippines, FEBC Manila	11995as			
1400-1500	Russia, Radio Moscow	9655na	9675na	9755na	11840na
		11995na	12050na	15435na	15485na
		17670na	21690na		
1400-1500	Sierra Leone, SLBS	3316do	5980do		
1400-1500	Singapore, SBC1	5010do	5052do	11940do	
1400-1500 vl	South Africa,Radio Oranje	9630do			
1400-1500	South Korea, Seoul	9570as			
1400-1500	Sri Lanka B'casting Corp.	6075as	9720as		
1400-1500 sa	Tanzania	5985af	9684af	11765af	
1400-1500	USA, CSMonitor Boston	9530as	13625as	13760am	15665eu
		17555am			
1400-1500 sa	USA, CSMonitor Boston	13710na			
1400-1500	USA, KTBN Salt Lake City	7510na			
1400-1500	USA, VOA Washington	6110as	9760as	15160au	15425au
1400-1500	USA, WHRI Noblesville	9465na	15105na		
1400-1500	USA, WJCR Upton, Kentucky		7490na		
1400-1500	USA, WWCR Nashville	12160na	15690am		
1400-1500	USA, WYFR Okeechobee, FL		9705am	11550as	11830am
		17760am			
1405-1430	Finland, YLE	6120va	6155eu	9730af	11755eu
		11820va	15440me	17880eu	
1415-1425	Nepal, Kathmandu	3230do	5005do	7165do	
1415-1429	Canada, RCI Montreal	11935eu	15305eu	15315eu	15325eu
		17795eu	17820eu	21545eu	
1415-1500	Bhutan Broadcasting Svc	5023do			
1430-1500	Albania, Radio Tirana	7155eu	9760eu		
1430-1500 mtwhfa	Cameroon CRTV Douala	4795do			
1430-1500	Ecuador, HCJB Quito	11925am	17890am	21455am	
1430-1500	Myanmar, Voice of, Burma	5990do			
1430-1500	Netherlands	9890as	15150as	17605as	21665as
1430-1500	Romania, R.Romania Int'l	11775as	15335as	17720as	
1430-1500	United Kingdom,BBC London	5975eu	6045eu	6180eu	6190af
		6195as	9410eu	9740as	9750eu
		9760eu	11750as	11820as	11940af
		12095eu	15070va	15310as	15575me
		17640va	17705eu	17790af	17880af
		7180as	21470af	21660af	
1440-1450 mtwhfa	Venezuela, Radio Nacional	9540om			
1445-1500 smwha	Mongolia, Ulaanbaatar	7260as	13780as		

SELECTED PROGRAMS

Sundays

1401 BBC: Feature. This month, Christopher Cook considers Michelangelo, Julius II, and the rest of "The Italian Renaissance."
1415 Radio Korea: Echoes Of Korean Music. See S 1115.
1430 BBC: Anything Goes. Bob Holness presents a variety of music and other recordings.
1430 Radio Australia: Communicator. The latest developments in the media and communications world.
1435 Radio Korea: Shortwave Feedback. See S 1135.

Mondays

1405 BBC: Outlook. Conversation, controversy, and color from the UK and the world.
1415 Radio Korea: News Commentary. See S 0015.
1420 Radio Korea: Seoul Calling. See M 1120.
1425 Radio Australia: Stock Exchange Report. Financial news from Sydney and other exchanges.
1430 BBC: Off The Shelf. See M 0430.
1430 Radio Australia: Music Of Radio Australia. See S 1113.
1440 Radio Korea: Tales From Korea's Past. See M 1140.
1445 BBC: Talks. See S 0445.
1445 Radio Australia: Word Of Mouth. Oral histories of Australians.

Tuesdays

1405 BBC: Outlook. See M 1405.
1415 Radio Korea: News Commentary. See S 0015.
1420 Radio Korea: Seoul Calling. See M 1120.
1425 Radio Australia: Stock Exchange Report. See M 1425.
1430 BBC: Off The Shelf. See M 0430.
1430 Radio Australia: Lane's Company. Terry Lane talks with people from all walks of life.
1440 Radio Korea: Korean Cultural Variety. See T 1140.
1445 BBC: Feature. See M 0145.

Wednesdays

1405 BBC: Outlook. See M 1405.
1415 Radio Korea: News Commentary. See S 0015.
1420 Radio Korea: Seoul Calling. See M 1120.
1425 Radio Australia: Stock Exchange Report. See M 1425.
1430 BBC: Off The Shelf. See M 0430.
1430 Radio Australia: Innovations. Desley Blanch reports on inventions and innovative practices.
1440 Radio Korea: Pulse Of Korea. See W 1140.
1445 BBC: Good Books. Recommendations of books to read (except 29th: A Month In The Country, Michael Hayes' wanderings of rural Britain).

Thursdays

1405 BBC: Outlook. See M 1405.
1415 Radio Korea: News Commentary. See S 0015.
1420 Radio Korea: Seoul Calling. See M 1120.
1425 Radio Australia: Stock Exchange Report. See M 1425.
1430 BBC: Off The Shelf. See M 0430.
1430 Radio Australia: Monitor. A look at the impact of science and technology on society.
1440 Radio Korea: Forward To Reunification. See H 1140.
1445 BBC: Recording Of The Week. See M 0545.

Fridays

1405 BBC: Outlook. See M 1405.
1415 Radio Korea: News Commentary. See S 0015.
1420 Radio Korea: Let's Sing Together. See F 1120.
1425 Radio Australia: Stock Exchange Report. See M 1425.
1430 BBC: Off The Shelf. See M 0430.
1430 Radio Australia: Science File. See W 1130.
1440 Radio Korea: Let's Learn Korean! See F 1140.
1445 BBC: Global Concerns. See F 0145.

Saturdays

1401 BBC: Sportsworld. The latest soccer, cricket, tennis, golf, and more.
1415 Radio Korea: News Commentary. See S 0015.
1420 Radio Korea: Sites And Sounds. See S 0020.
1430 Radio Australia: Interaction. See S 0530.
1435 Radio Korea: From Us To You. See S 0035.

English language

shortwave guide

1500 UTC [11:00 AM EDT/8:00 AM PDT]

FREQUENCIES

1500-1515 smwha	Mongolia, Ulaanbaatar	7260as	13780as		
1500-1525	Netherlands	9890pa	15150pa	17580pa	17605pa
		21665pa			
1500-1525	Netherlands	9890as	15150as	17605as	21665as
1500-1530 mtwhf	Portugal	21515me			
1500-1530	Romania, R.Romania Int'l	11775as	15335as	17720as	
1500-1530	Sweden	15270va	17870na	21500na	
1500-1530	Swiss Radio Int'l	13635as	15505as	17670as	21770as
1500-1530 sa	Tanzania	5985af	9684af	11765af	
1500-1530	United Kingdom,BBC London	3915as	5975eu	6045eu	6180eu
		6190af	6195eu	6195as	9410eu
		9515na	9740na	9750eu	9760eu
		11750as	11775na	11940af	12095eu
		15070va	15310as	15400af	15420af
		7180as	15260na	15575me	17640va
		17705eu	17790af	17840af	17860af
		17880af	21470af	21490af	21660af
1500-1550	Germany, Deutsche Welle	9735af	11965af	13610af	17735af
		17765af	21600af		
1500-1550	North Korea	9325eu	9640af	9977af	11705eu
1500-1555	Polish Radio Warsaw	7285eu	9525eu	11840eu	
1500-1555	Seychelles, FEBA	9810as	11685af	15330as	
1500-1600	Australia	5995pa	6060pa	6080pa	7240pa
		9580pa	9770pa	12000pa	13755pa
		15170as	17565pa		
1500-1600	Bahrain Broadcasting Svc	6010me			
1500-1600	Bangladesh	4880do			
1500-1600	Cameroon CRTV Yaounde	4850do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955am	17820am		
1500-1600	China, Radio Beijing	7405na	11815as	15165as	
1500-1600	Cook Islands	11760pa			
1500-1600	Costa Rica, RFPI	15030am	21465am		
1500-1600	Ecuador, HCJB Quito	11925am	17890am	21455am	
1500-1600	Ethiopia, Voice of	7165af			
1500-1600	Ghana, Radio 1, Accra	4915do			
1500-1600	Ghana, Radio 2, Accra	7295do			
1500-1600	Guam, KTWR Guam	11650as			
1500-1600	Japan NHK	11865am			
1500-1600	Jordan	9560eu			
1500-1600 mtwhf	Kenya, Voice of	4935do			
1500-1600	Luxembourg, RTL	15350va			
1500-1600	Malaysia, RTM Radio 4	7295do			
1500-1600	Malta, V. of the Medit.	11925eu			
1500-1600	Myanmar, Voice of, Burma	5990do			
1500-1600	Nigeria	4990do	7285do		
1500-1600	Nigeria, Voice of	7255af			
1500-1600	Philippines, FEBC Manila	11995as			
1500-1600	Russia, Radio Moscow	9655na	9755na	11665na	11840na
		11995na	12030na	12050na	13645na
		15405na	15485na	17670na	
1500-1600 twhfa	Seychelles, FEBA	9810as	15330as		
1500-1600	Sierra Leone, SLBS	3316do	5980do		
1500-1600	Singapore, SBC1	5010do	5052do	11940do	
1500-1600 vl	South Africa,Radio Oranje	9630do			
1500-1600	Sri Lanka B'casting Corp.	6075as	9720as		
1500-1600	USA, CSMonitor Boston	9530as	13625as	13760pa	15665eu
		17555am			
1500-1600 sa	USA, CSMonitor Boston	13710na			
1500-1600	USA, KTBN Salt Lake City	7510na			
1500-1600	USA, VOA Washington	6110as	7125as	9645as	9760as
		15395as			
1500-1600	USA, VOA Washington	9700eu	15205me		
1500-1600	USA, WHRI Noblesville	15105na	21840sa		
1500-1600	USA, WJCR Upton, Kentucky		7490na		
1500-1600	USA, WWCR Nashville	15690am	17535na		
1500-1600	USA, WYFR Okeechobee, FL		11830am	15215am	17760am
		21525eu			
1522-1535	Taiwan, Voice of	9910as			
1530-1540 mtwhfa	Greece, Voice of	15630na	15650na	17525na	
1530-1600	Austria, ORF Vienna	6155eu	11780as	13730eu	21490va
1530-1600	Netherlands	9890as	15150as	17580as	17605as
		21665as			
1530-1600	Sudan Nat'l B'casting Cor	9540do	9550do	11635do	
1530-1600	Switzerland, SRI	15430va			
1530-1600	Tanzania	5985af	9684af	11765af	
1530-1600	United Kingdom,BBC London	6190af	6195eu	6195as	7180as
		9410eu	9740na	9750eu	11750as
		11775na	12095eu	15070va	15260as
		15310as	15400af	17640va	17705eu
		17840va	17880af	21470af	21660af
1545-1600	South Korea World News	7275va			
1545-1600	Vatican Radio	15090au	17865au		

SELECTED PROGRAMS

Sundays

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.
1513 Radio Australia: Music Of Radio Australia. See S 1113.
1515 BBC: Sunday Sportsworld. This month, hear the Wimbledon finals (5th) and special Olympics coverage (26th).
1530 Radio Australia: Connections. Trevor Robertson presents education issues of the Asian/Pacific region.
1534 Deutsche Welle: Pop from Germany. A look at the German pop music scene.

Mondays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 MBC, Blantyre, Malawi: Commentary. Opinion on the latest current events developments.
1513 Radio Australia: Pacific Sunrise. Business and export development in the Pacific basin.
1515 BBC: Feature/Drama. See M 0101.
1530 Radio Australia: Points Of Law. Geraldine Coutts reports on law and society in Oceania.
1534 Deutsche Welle: Monday Special. An interview or report on an event or development with special relevance for Africa.

Tuesdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1513 Radio Australia: Music Of Radio Australia. See S 1113.
1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener rock music requests.
1530 Radio Australia: AgriNews. News about agriculture of the Asian/Pacific region, with Denis Gibbons.
1534 Deutsche Welle: Insight. An in-depth feature, giving the background to political events and international developments.

Wednesdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 MBC, Blantyre, Malawi: Commentary. See M 1510.
1513 Radio Australia: Music Of Radio Australia. See S 1113.
1515 BBC: Talks. See M 0415.
1530 BBC: Comedy/Drama. "Two Cheers For June" is a satirical look at the month just past (1st); A new comedy series on a young writer? It's "The Nick Revell Show"(thru August 12th).
1530 Radio Australia: Matters Of Faith. See M 0430.
1534 Deutsche Welle: Living in Germany. See M 0116.

Thursdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1513 Radio Australia: Music Of Radio Australia. See S 1113.
1515 BBC: Music. See S 2315.
1530 Radio Australia: Business Horizons. See T 1130.
1534 Deutsche Welle: Spotlight on Sport. Background stories and coverage of important sporting events.

Fridays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1510 MBC, Blantyre, Malawi: Commentary. See M 1510.
1513 Radio Australia: Music Of Radio Australia. See S 1113.
1515 BBC: Music Review. See H 2315.
1534 Deutsche Welle: Economic Notebook. A look at the economic scene in Germany and around the world.

Saturdays

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.
1513 Radio Australia: Music Of Radio Australia. See S 1113.
1515 BBC: Sportsworld. See A 1430.
1530 Radio Australia: One World. See S 1130.
1534 Deutsche Welle: Science and Technology. See M 0234.

1600 UTC [12:00 PM EDT/9:00 AM PDT]

FREQUENCIES

1600-1605	Singapore, SBC1	5010do	5052do	11940do	
1600-1610	Lesotho, Maseru	4800do			
1600-1610	Malawi B'casting Corp.	3381do			
1600-1625	Netherlands	9890as	15150as	17580as	17605as
		21665as			
1600-1630	Canada, RCI Montreal	11935eu	15305eu	15325eu	17820eu
		21545eu			
1600-1630 as	Norway	15230af	17720as		
1600-1630	Pakistan	11570me	13665me	15060me	15550af
		17555af	17725me		
1600-1630	United Kingdom,BBC London	1540af	3915as	5975as	6190af
		6195eu	9410eu	9630af	9740me
		9750eu	11750as	11775na	11940af
		12095eu	15070eu	15400af	17640va
		17695eu	17705eu	17860af	17880af
		7180as	15260na	15310as	21470af
		21660af			
1600-1630	USA, VOA Washington	9700eu 1	5205me		
1600-1630	Vietnam, Voice of	9840eu	12020eu	15010eu	
1600-1630	Yemen	5970as	7190as		
1600-1635	Guam, KTWR Guam	11650as			
1600-1640 vl	South Africa,Radio Oranje	9630do			
1600-1640	Vatican Radio	15090au	17865au		
1600-1645	UAE Radio, Dubai	11795af	13675eu	15320eu	21605eu
1600-1650	Germany, Deutsche Welle	6170as	7225as	9875as	15105as
		15415as	15595as	17810as	21680as
1600-1700	Australia	5995pa	6060pa	6080pa	9580pa
		9860pa	11910pa	12000pa	13755pa
		15170as	17565pa		
1600-1700	Bahrain Broadcasting Svc	6010me			
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700	China, Radio Beijing	4130do	8260af	11575af	15130af
		15170af			
1600-1700	Cook Islands	11760pa			
1600-1700	Costa Rica, RFPI	15030na	21465na		
1600-1700	France, RFI Paris	6175eu	11705af	12015af	15530me
		17620af	17795af	17850af	
1600-1700	Ghana, Radio 1, Accra	4915do			
1600-1700	Ghana, Radio 2, Accra	7295do			
1600-1700	Guam, KSDA Guam	11980as			
1600-1700 mtwhf	Kenya, Voice of	4935do			
1600-1700	Luxembourg, RTL	15350va			
1600-1700	Nigeria	4990do			
1600-1700	Nigeria, Voice of	7255af			
1600-1700	Russia, Radio Moscow	9755na	9825na	11665na	11840na
		11995na	12030na	12050na	13645na
		15375na	15425na	15485na	17670na
		17695na			
1600-1700	Saudi Arabia BC Svc	9705eu	9720eu		
1600-1700	Sierra Leone, SLBS	3316do	5980do		
1600-1700	Somali People, Voice of	6320do			
1600-1700	South Africa, Radio RSA	9565af	11885af		
1600-1700	South Korea, Seoul	5975om	9870af		
1600-1700	Sri Lanka B'casting Corp.	6075as	9720as		
1600-1700	Swaziland, TWR Swaziland	9600af			
1600-1700	Tanzania	5985af	9684af	11765af	
1600-1700	USA, CSMonitor Boston	11580as	13625as	17510na	21640af
1600-1700 sa	USA, CSMonitor Boston	13710na	17555am		
1600-1700	USA, TBN Salt Lake City	15590am			
1600-1700	USA, VOA Washington	9575af	11920af	11995af	15410af
		15495af	15580af	17650af	17800af
		21625af			
1600-1700	USA, WHRI Noblesville	13760am	15105am	21840am	
1600-1700	USA, WJCR Upton, Kentucky		7490na		
1600-1700	USA, WWCR Nashville	15690am	17535am		
1600-1700	USA, WYFR Okeechobee, FL		11830am	15215am	15355am
		17760am	21525eu	21615af	
1600-1700	Zambia,Radio Zambia Int'l	9505af	11880af	17895af	
1610-1615 mtwhf	Botswana, Gaborone	5955af	7255af		
1620-1658 mtwhf	Morocco, Rabat	17595as			
1630-1657	Canada, RCI Montreal	7150as	9555as		
1630-1700	Ecuador, HCJB Quito	15270me	17790me	21455me	
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700 mtwhf	Portugal	21515me			
1630-1700	Rwanda, RTV Rwandiase	3330	6055		
1630-1700	United Kingdom,BBC London	3915as	5975as	6190af	6196eu
		9410eu	9630af	9740me	11750as
		11775na	11940af	12095eu	15070eu
		15260na	15310as	15400af	15420af
		17640va	17695eu	17860af	17880af
		21470af	21660af		
1630-1700	USA, VOA Washington	6180eu	9700eu	9760me	11710me
		15205me	15245me		
1635-1700 s	Guam, KTWR Guam	11650as			
1650-1700 smtwhf	New Zealand, RNZI	9670pa			

SELECTED PROGRAMS

Sundays

1609 Deutsche Welle: Arts on the Air. See S 1109.
1615 BBC: Feature. See S 0230.
1615 Radio Korea: Echoes Of Korean Music. See S 1115.
1630 Radio Australia: Music Of Radio Australia. See S 1113.
1634 Deutsche Welle: German by Radio. See S 0134.
1635 Radio Korea: Shortwave Feedback. See S 1135.
1645 BBC: Letter From America. See S 0615.
1645 Radio Australia: Sports Report. See S 1313.

Mondays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: New Ideas. Innovative developments in technology and new products.
1615 Radio Korea: News Commentary. See S 0015.
1620 Radio Korea: Seoul Calling. See M 1120.
1630 Radio Australia: Music Of Radio Australia. See S 1113.
1634 Deutsche Welle: Asia-Pacific Report. Correspondents' reports, interviews, and background news from the Asia-Pacific region.
1635 BBC: Talks. Some of the world's top athletes feature on "The Olympians" (6th/13th/20th); "Writers In A Nutshell" provides Cliff Notes to the likes of Nadine Gordimer and E Forster (through September 14th)
1640 Radio Korea: Tales From Korea's Past. See M 1140.
1645 BBC: The World Today. A look at a topical aspect of the international scene.
1645 Radio Australia: Sports Report. See S 1313.

Tuesdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Megamix. See T 1130.
1615 Radio Korea: News Commentary. See S 0015.
1620 Radio Korea: Seoul Calling. See M 1120.
1630 Radio Australia: Music Of Radio Australia. See S 1113.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1640 Radio Korea: Korean Cultural Variety. See T 1140.
1645 BBC: The World Today. See M 1645.
1645 Radio Australia: Sports Report. See S 1313.

Wednesdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Rock/Pop Music. See T 0630.
1615 Radio Korea: News Commentary. See S 0015.
1620 Radio Korea: Seoul Calling. See M 1120.
1630 Radio Australia: Music Of Radio Australia. See S 1113.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1640 Radio Korea: Pulse Of Korea. See W 1140.
1645 BBC: The World Today. See M 1645.
1645 Radio Australia: Sports Report. See S 1313.

Thursdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Network UK. Issues and events affecting people across the UK.
1615 Radio Korea: News Commentary. See S 0015.
1620 Radio Korea: Seoul Calling. See M 1120.
1630 Radio Australia: Music Of Radio Australia. See S 1113.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1640 Radio Korea: Forward To Reunification. See H 1140.
1645 BBC: The World Today. See M 1645.
1645 Radio Australia: Sports Report. See S 1313.

Fridays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Science In Action. The latest news about scientific innovations.
1615 Radio Korea: News Commentary. See S 0015.
1620 Radio Korea: Let's Sing Together. See F 1120.
1630 Radio Australia: Music Of Radio Australia. See S 1113.
1634 Deutsche Welle: Asia-Pacific Report. See M 1634.
1640 Radio Korea: Let's Learn Korean! See F 1140.
1645 BBC: The World Today. See M 1645.
1645 Radio Australia: Sports Report. See S 1313.

Saturdays

1609 Deutsche Welle: International Talking Point. See S 0419.
1615 BBC: Sportsworld. See A 1430.
1615 Radio Korea: News Commentary. See S 0015.
1620 Radio Korea: Sites And Sounds. See S 0020.
1623 Deutsche Welle: Development Forum. See A 1513.
1630 Radio Australia: Music Of Radio Australia. See S 1113.
1634 Deutsche Welle: Religion and Society. See S 1509.
1635 Radio Korea: From Us To You. See S 0035.
1645 Radio Australia: Sports Report. See S 1313.

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1705	Ghana, Radio 2, Accra	7295do			
1700-1710	Cameroon CRTV Bafoussam		4000do		
1700-1715	Israel, Kol Israel	11587na	11675eu	15590af	15650va
1700-1728	Sierra Leone, SLBS	3316do	5980do		
1700-1730	Canada, RCI Montreal	5995eu	7235eu	13650eu	15325eu
		17820eu	21545eu		
1700-1730 as	Norway	9655eu			
1700-1730	Sri Lanka B'casting Corp.	6075as	9720as		
1700-1730	Swaziland, TWR Swaziland	3200af	9520af		
1700-1730	Swiss Radio Int'l	13635af	15430af	17635af	21770af
1700-1730	United Kingdom,BBC London	3255af	7160me	15260na	21470af
		21660af			
		3915as	5975as	6005af	6180eu
		6190af	6195eu	9410eu	9630af
		9740eu	11750as	11775na	12095eu
		15070eu	15310as	15400af	15420af
		17640va	17695eu	17860af	17880af
1700-1730	USA, VOA Washington	3980eu	6040me	9575af	9700eu
		9760me	11920af	15205me	15410af
		15445af	15495af	15580af	17650af
		17800af	21625af		
1700-1750	North Korea	9325eu	9640af	9977af	11705eu
1700-1755	Polish Radio Warsaw	7270eu	9525eu		
1700-1800	Algeria, R. Algiers	17745na			
1700-1800	Australia	5995pa	6060pa	6080pa	9580pa
		9860pa	11910pa	12000pa	13755pa
		15170as			
1700-1800	Bahrain Broadcasting Svc	6010me			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, Radio Beijing	4130af	8260af	9570af	11575af
		15345af			
1700-1800	Cook Islands	11760pa			
1700-1800	Costa Rica, RFPI	15030na	21465na		
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800 sa	Eq.Guinea, R.East Africa	7190af			
1700-1800	Ghana, Radio 1, Accra	4915do			
1700-1800	Guam, KSDA Guam	13720af			
1700-1800 varies	Italy, IRRS Milan, Italy	7125eu			
1700-1800	Japan NHK	7140as	9505am	11815na	11865na
		15345me			
1700-1800 mtwhf	Kenya, Voice of	4935do			
1700-1800	Luxembourg, RTL	15350va			
1700-1800 smtwhf	New Zealand, RNZI	9675pa			
1700-1800	Nigeria	3326do	4990do		
1700-1800	Nigeria, Voice of	7255af			
1700-1800	Pakistan	11570eu	15550eu		
1700-1800	Russia, Radio Moscow	11840na	11995na	12030na	12050na
		13645na	15375na	15425na	15580na
		17670na	17695na	17710na	
1700-1800	Saudi Arabia BC Svc	9705eu	9720eu		
1700-1800	South Africa, Radio RSA	9565af	11885af		
1700-1800	Tanzania	5985af	9684af	11765af	
1700-1800	USA, CSMonitor Boston	11580as	13625as	17510na	21640af
1700-1800 sa	USA, CSMonitor Boston	13710na	17555am		
1700-1800	USA, KTBN Salt Lake City	15590am			
1700-1800	USA, VOA Washinton	6110as	7125as	9645as	15395as
1700-1800	USA, WHRI Noblesville	13760am	15105am		
1700-1800	USA, WJCR Upton, Kentucky		7490na		
1700-1800 smtwhf	USA, WMLK Bethel, Penna.	9465eu			
1700-1800	USA, WWCR Nashville	15690	17535na		
1700-1800	USA, WYFR Okeechobee, FL		21500va		
1700-1800	Zambia,Radio Zambia Int'l	9505af	11880af	17895af	
1706-1800	Ghana, Radio 2, Accra	3366do			
1715-1730	Cameroon CRTV Beau	3970do			
1715-1730	South Korea World News	7550as	15575as		
1715-1730	Vatican Radio	6245eu	7250eu		
1715-1745	United Kingdom,BBC London	9560ca	21660ca		
1728-1800	Sierra Leone, SLBS	3316do			
1730-1745 a	Cameroon CRTV Douala	4795do			
1730-1745	Cyprus, Radio Bayrak	6150va			
1730-1800	Bulgaria, Radio Sofia	9700af	11720af	11765af	15330af
		17780af	17825af		
1730-1800 a	Latvia, Radio Riga	5935eu			
1730-1800	Netherlands	6020af	9605af	21515af	21590af
1730-1800	Romania, R.Romania Int'l	15340af	15365af	17745af	17805af
1730-1800	Swaziland, TWR Swaziland	3200af			
1730-1800	United Kingdom,BBC London	3255af	3915as	5975as	6005af
		6180eu	6190af	6195eu	9410eu
		9630af	9740me	11775na	12095eu
		15070eu	15260na	15310as	15400af
		15420af	17640va	17695eu	17860af
		17880af	21660af		
1730-1800	USA, VOA Washington	6040eu	9575af	9700eu	9760eu
		11920af	15205eu	15205me	15410af
		15495af	15580af	17650af	17800af
		19261af	21625af		
1730-1800	Vatican Radio	11625af	15090af	17730af	
1740-1800	Cameroon CRTV Yaounde	4850do			
1745-1800 mtwhfa	Cameroon CRTV Douala	4795do			
1745-1800	India, All India Radio	7412as	9950as	11620as	11860as
		11935as	15080as		
1745-1800 tent	Madagascar,RTV Madagascar		3232do	3286do	5005do

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1810	Malawi B'casting Corp.	3381do			
1800-1825	Belgium, BRT Brussels	9905eu	17750af		
1800-1825	Netherlands	6020af	9605af	21515af	21590af
1800-1830	Canada, RCI Montreal	13670af	15260af	17820af	
1800-1830	Congo, RTV Congolaise	3265af	4765af		
1800-1830	Czechoslovakia	5930eu	6055eu	7345eu	9605eu
1800-1830	Egypt, Radio Cairo	15255af			
1800-1830	United Kingdom,BBC London	3255af	3955eu	5975as	6180eu
		6190af	6195eu	7160me	7325af
		9410eu	9600af	9740me	11750as
		12095eu	15070eu	15310as	15400af
		17640eu	17880af	21660af	
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1800-1840 w	Cameroon CRTV Bertoua	4750do			
1800-1845 mtwhfa	Cameroon CRTV Douala	4795do			
1800-1845	Swaziland, TWR Swaziland	3200af	9600af		
1800-1850 smtwhf	New Zealand, RNZI	9675pa			
1800-1900	Australia	5995pa	6060pa	6080pa	9505pa
		9580pa	9860pa	11910pa	12000pa
1800-1900	Bahrain Broadcasting Svc	6010me			
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Bulgaria, Radio Sofia	9700af	11720af	11765af	15330af
		17780af	17825af		
1800-1900	Cameroon CRTV Yaounde	4850do			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Cook Islands	11760pa			
1800-1900	Costa Rica, RFPI	13630am	15030am	21465am	
1800-1900 sa	Eq.Guinea, R.East Africa	7190af			
1800-1900	Ethiopia, Voice of	9662af			
1800-1900	Ghana, Radio 1, Accra	4915do			
1800-1900	Ghana, Radio 2, Accra	7295do			
1800-1900	Guam, KSDA Guam	13720as			
1800-1900	India, All India Radio	7412as	9950as	11620as	11860as
		11935as	15080as		
1800-1900 varies	Italy, IRRS Milan, Italy	7125eu			
1800-1900	Ivory Coast, Abidjan	11920af			
1800-1900 mtwhf	Kenya, Voice of	4935do			
1800-1900	Kuwait, Radio Kuwait	13620na			
1800-1900	Luxembourg, RTL	15350va			
1800-1900 irreg	Mozambique	3265af	4855af	9618af	
1800-1900	Nigeria	3326do	4990do		
1800-1900	Russia, Radio Moscow	9765va	9780va	9795va	9855va
		9860va	9875va	9895va	11630va
		11685va	11745va	11840am	11995na
		12030na	12050na	15425na	15515na

1800 UTC cont'd

		17695na	17710na		
1800-1900	Saudi Arabia BC Svc	9705eu	9720eu		
1800-1900	Sierra Leone, SLBS	3316do			
1800-1900	South Korea, Seoul	15575eu			
1800-1900	Tanzania	5985af	9684af	11765af	
1800-1900	USA, CSMonitor Boston	9425pa	17510na	17725eu	21545af
1800-1900 sa	USA, CSMonitor Boston	17555am			
1800-1900	USA, KTBN Salt Lake City	15590			
1800-1900	USA, VOA Washington	6040eu	9700eu	9760me	15205me
		6040eu	9575af	9700eu	9760me
		11920af	15205me	15410af	15445
		15580af	17650af	17800af	19261as
		21625af			
1800-1900	USA, WHRI Noblesville	13760na	17830sa		
1800-1900	USA, WINB Red Lion, Penn.	15295eu			
1800-1900	USA, WJCR Upton, Kentucky		7490na		
1800-1900	USA, WMLK Bethel, Penna.	9465eu			
1800-1900	USA, WWCR Nashville	15690na	17535na		
1800-1900	USA, WYFR Okeechobee, FL		21500va		
1800-1900	Zambia,Radio Zambia Int'l	9505af	11880af	17895af	
1815-1830	Lebanon, Radio Voice of	6550me			
1815-1900	Bangladesh	12030as	15255as		
1830-1900	Afghanistan, Kabul	9635am			
1830-1900	Austria, ORF Vienna	5945eu	6155eu	12010me	13730af
1830-1900 as	Canada, RCI Montreal	13670me	15260me	17820me	
1830-1900	Finland, YLE	6120eu	9730af	11755af	15440eu
1830-1900	Iran, Islamic Republic	9022af	15260eu		
1830-1900	Netherlands	6020af	9605af	21515af	21590af
1830-1900	Sri Lanka B'casting Corp.	9720eu	15120eu		
1830-1900	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7325eu	9410eu
		9600af	11750as	12095eu	15070eu
		15400af	17880af	21660af	
1830-1900	Yugoslavia, for UN Forces	6100do	15140eu		
1830-1900	Yugoslavia, Radio Federal	6100eu	15140af		
1833-1900	Ivory Coast, Abidjan	11920af			
1840-1850 mtwhfa	Greece, Voice of	15630af	17525af		
1840-1850 mtwhfa	Venezuela, Radio Nacional	9540om			
1845-1900	Ghana B'casting Corp.	6130af			
1845-1900	Guinea, RTV Conarky	4900af	7125af		
1845-1900 s	Mali, RTV Mali	4783do	4835do	5995do	7285do
1845-1900	Swaziland, TWR Swaziland	3200af			
1850-1900 smtwhf	New Zealand, RNZI	15120pa			

1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-1915	Tanzania	5985af	9684af	11765af	
1900-1920	Brazil, Radiobras	15265eu			
1900-1925	Netherlands	6020af	9605af	21515af	21590af
1900-1930 mtwhf	Canada, RCI Montreal	13670me	15260me	17820me	
1900-1930 as	Canada, RCI Montreal	5995eu	7235eu	13650eu	15325eu
		17875eu	21675eu		
1900-1930	Iran, Islamic Republic	9022af	15260eu		
1900-1930	Israel, Kol Israel	11587eu	11605sa	11675eu	15640eu
		17575eu	17630af		
1900-1930	Ivory Coast, Abidjan	11920af			
1900-1930	Japan NHK	9505am	9640am	9645au	11850af
1900-1930 s	Lebanon, King of Hope	11530me			
1900-1930 as	Norway	17860va	21705va		
1900-1930	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	7325eu
		9410eu	9600af	9630af	11750pa
		12095eu	15070eu	15400af	17880af
		21660af			
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1900-1945	Cameroon CRTV Yaounde	4850do			
1900-1950	Germany, Deutsche Welle	11785af	11810af	13780af	13790af
		15350af	15390af	17810af	
1900-2000	Argentina,RAE BuenosAires	15345eu			
1900-2000	Australia	5995pa	6060pa	6080pa	7240pa
		9505pa	9580pa	9860pa	11720as
		11910pa	12000pa		
1900-2000	Bahrain Broadcasting Svc	6010me			
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000 mtwhf	Canada, RCI for UN Forces	5995eu	7235eu	13650eu	15325eu
		17875eu	21675eu		
1900-2000	China, Radio Beijing	9440af	11515af		
1900-2000	Cook Islands	11760pa			
1900-2000	Costa Rica, RFPI	13630am	15030am	21465am	
1900-2000	Ecuador, HCJB Quito	15270eu	17790eu	21455eu	
1900-2000 sa	Eq.Guinea, R.East Africa	7190af			
1900-2000	Ghana B'casting Corp.	6130af			
1900-2000	Ghana, Radio 1, Accra	4915do			
1900-2000	Ghana, Radio 2, Accra	7295do			
1900-2000	India, All India Radio	7412va	9950va	11620va	11860va
		11935va	15080va		
1900-2000 mtwhf	Kenya, Voice of	4935do			
1900-2000	Kuwait, Radio Kuwait	13620na			
1900-2000	Luxembourg, RTL	15350va			
1900-2000 s	Morocco, Rabat	11920as			
1900-2000 smtwhf	New Zealand, RNZI	15120pa			
1900-2000	Nigeria	3326do	4990do		
1900-2000	Nigeria, Voice of	7255af			
1900-2000	Romania, R.Romania Int'l	7145eu	9690eu	9750eu	11940eu
1900-2000	Russia, R Galaxy, Moscow	9880do			
1900-2000	Russia, Radio Moscow	9860va	9875va	9895va	11630va
		11685va	11840am	12050va	12055va
		12060va	12070na	13645na	15180na
		15375na	15405na	15415na	15425na
		15500na	15580na	17605na	17695na
1900-2000	Saudi Arabia BC Svc	9705eu	9720eu		
1900-2000	Sierra Leone, SLBS	3316do			
1900-2000	Spanish National Radio	6130as	9675af	9685eu	9875eu
1900-2000	Sri Lanka B'casting Corp.	9720eu	15120eu		
1900-2000	Swaziland, TWR Swaziland	3200af	3240af		
1900-2000	USA, CSMonitor Boston	9425pa	17510na	17725eu	21545af
1900-2000 sa	USA, CSMonitor Boston	17555am			
1900-2000	USA, KTBN Salt Lake City	15590am			
1900-2000	USA, KVOH Los Angeles	17775sa			
1900-2000	USA, VOA Washington	6040eu	9525as	9575af	9700eu
		9760eu	11710eu	11870as	11920af
		15180au	15205eu	15410af	15445af
		15495af	15580af	17800af	19261af
1900-2000	USA, WHRI Noblesville	13760na	17830na		
1900-2000	USA, WINB Red Lion, Penn.	15295eu			
1900-2000	USA, WJCR Upton, Kentucky		7490na		
1900-2000	USA, WMLK Bethel, Penna.	9465eu			
1900-2000	USA, WWCR Nashville	15690am	17535na		
1900-2000	USA, WYFR Okeechobee, F	15355eu	21615af		
1900-2000	Zambia,Radio Zambia Int'l	9505af	11880af	17895af	
1910-1915	Botswana, Gaborone	3356af			
1920-1930	Cameroon CRTV Beau	3970do			
1930-1940 irr	Burkina Faso	4815af	7230af		
1930-2000	Canada, RCI Montreal	6010eu	7230eu	13650eu	15325eu
		17875eu	21675eu		
1930-2000	Czechoslovakia	6055eu	7345eu		
1930-2000 fa	Kazakhstan, R. Alma Ata	3955do	5035do	5260do	5960eu
		5970eu	7115eu	9505eu	9690eu
		11825eu	15215eu	15250eu	15270eu
		15285eu	15315eu	15360eu	15385eu
		17605eu	17730eu	17765eu	21490eu
1930-2000	Netherlands	17605af	21590af		
1930-2000	Polish Radio Warsaw	6095eu	6135eu	7145eu	7270eu
		9525eu			
1930-2000	Saipan, KFBS Saipan	9460af			
1930-2000	United Kingdom,BBC London	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7160me	7325eu
		9410eu	9600af	9630af	11750pa
		12095eu	15070eu	15400af	17880af
		21660af			
1935-1945	Togo, RTV Togolaise	5047af			
1935-1955	Italy, RAI, Rome	7275eu	9710eu	11800eu	
1940-2000 smwha	Mongolia, Ulaanbaatar	11850eu	12015eu		
1945-2000	Bulgaria, Radio Sofia	11765as	17780as	17825as	
1945-2000	South Korea World News	6135as			
1950-2000	Sudan Nat'l B'casting Cor	9540do	9550do	11635do	
1950-2000	Vatican Radio	5885eu	7250eu		

English language

shortwave guide

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2010 mtwhf	Kenya, Voice of	4935do			
2000-2010 w	Malawi B'casting Corp.	3381do			
2000-2010 smwha	Mongolia, Ulaanbaatar	11850eu	12015eu		
2000-2015 mtwhfa	Greece, Voice of	7450eu	9395eu		
2000-2025	Polish Radio Warsaw	6095eu	6135eu	7145eu	7270eu
		9525eu			
2000-2030	Bulgaria, Radio Sofia	11765as	17780as	17825as	
2000-2030 varies	Georgian Radio, Tbilisi	11760eu			
2000-2030	Netherlands	17605af	21590af		
2000-2030	Nigeria, Voice of	7255af			
2000-2030 mtwhf	Portugal	11740eu			
2000-2030	Swiss Radio Int'l	9885eu	9885me	12035me	13635me
		15505me			
2000-2030	United Kingdom,BBC London	3255af	3955eu	5975eu	6005af
		6180eu	6190af	6195eu	7160me
		7180pa	7325eu	9410eu	9600as
		9630af	11750pa	12095eu	15070eu
		15260sa	15340pa	15400af	17880af
		21660af			
2000-2030	Vatican Radio	9645af	11625af	15090af	
2000-2050	North Korea	6576eu	9345eu	9640af	9977af
2000-2100	Australia	5995pa	6060pa	6080pa	7240pa
		9580pa	9860pa	11720as	11910pa
		12000pa			
2000-2100	Bahrain Broadcasting Svc	6010me			
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, Radio Beijing	4130eu	9440af	9920eu	11500eu
		11715af	15170af		
2000-2100	Cook Islands	11760pa			
2000-2100	Costa Rica, RFPI	13630na	15030na	21465am	
2000-2100	Cuba, RHC Havana	15330eu	17705eu	17815me	
2000-2100 sa	Eq.Guinea, R.East Africa	7190af			
2000-2100	Ghana, Radio 1, Accra	4915do			
2000-2100	Ghana, Radio 2, Accra	7295do			
2000-2100	India, All India Radio	11935af	15080af		
2000-2100	Indonesia, Voice of	7125as	9675as	11752as	11785as
2000-2100	Kuwait, Radio Kuwait	13620na			
2000-2100	Lebanon, King of Hope	6280me			
2000-2100	Luxembourg, RTL	15350va			
2000-2100 smtwhf	New Zealand, RNZI	15120pa			
2000-2100	Nigeria	3326do	4990do		
2000-2100	Russia, R Galaxy, Moscow	9880do			
2000-2100	Russia, Radio Moscow	11840na	13665na	15405na	15425na
		15560na	15580na	17695na	
2000-2100 tes	Saipan, KFBS Saipan	9475af			
2000-2100	Saudi Arabia BC Svc	9705eu	9720eu		
2000-2100 mtwhf	Senegal (multilingual)	7210do			
2000-2100	Sierra Leone, SLBS	3316do			
2000-2100	Swaziland, TWR Swaziland	3200af	3240af		
2000-2100	USA, CSMonitor Boston	9455as	13625pa	15665eu	17510am
		17555sa			
2000-2100	USA, KTBN Salt Lake City	15590am			
2000-2100	USA, KVOH Los Angeles	17775sa			
2000-2100	USA, VOA Washington	6040eu	9700eu	9760eu	11710eu
		15160eu	15205eu	15410af	15445af
		15494af	15580af	17650af	17800af
		19261af	21485af	21625af	
2000-2100	USA, WHRI Noblesville	13760af	17830sa		
2000-2100	USA, WJCR Upton, Kentucky		7490na		
2000-2100	USA, WMLK Bethel, Penna.	9465eu			
2000-2100	USA, WWCR Nashville	15690na	17535na		
2000-2100	USA, WYFR Okeechobee, FL	7355eu	15566eu	15585eu	17750af
		21525eu			
2000-2100 s	Zambia,Radio Zambia Int'l	9505af	11880af	17895af	
2005-2100	Syria, Radio Damascus	12085na	15095na		
2010-2100 sa	Kenya, Voice of	4935do			
2015-2030	Benin, Voice of the Rev.	4870af	5025af		
2025-2045	Italy, RAI, Rome	7235me	9575me	11800me	
2030-2035	Latvia, 1st Programme	5935do			
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100 mh	Estonia, Tallinn	5925eu	9560eu		
2030-2100	Korea, Seoul	6480eu	7550af	15575eu	
2030-2100	Sweden	6065va	9655va	17730as	
2030-2100	United Kingdom,BBC London	3255af	3955eu	5975ca	6005af
		6040	6180eu	6190af	6195eu
		7180pa	7325eu	9410eu	11750pa
		12095eu	15070eu	15260sa	15340pa
		15400af	15495	15580as	
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu	
2045-2100	South Korea World News	5975as			

2100 UTC [5:00 PM EDT/2:00 PM PDT]

2100-2105	Syria, Radio Damascus	12085na	15095na		
2100-2106	Bahrain Broadcasting Svc	6010me			
2100-2110	Malawi B'casting Corp.	3381do			
2100-2110	Vatican Radio	5885eu	7250eu		
2100-2115	Swaziland, TWR Swaziland	3240af			
2100-2125	Belgium, BRT Brussels	5910eu	9905eu		
2100-2129	Canada, RCI Montreal	5995eu	7235eu	13650eu	
2100-2130	China, Radio Beijing	3985eu	11715af	15170af	
2100-2130	Czechoslovakia	5930eu	6055eu	7345eu	9605eu
2100-2130	Lebanon, King of Hope	6280me			
2100-2130 smtwhf	New Zealand, RNZI	15120pa			
2100-2130 as	Norway	17735va	21705va		
2100-2130 mtwhf	Portugal	15250af			
2100-2130	South Korea, Seoul	6480eu	7550af	15575eu	
2100-2130	Sweden	6065va	9655va	17730as	
2100-2130	United Kingdom,BBC London	3255af	3955eu	5975ca	6005af
		6180eu	6195as	7325eu	9410eu
		9590na	11750pa	12095eu	15070na,
		15260sa	15340pa	15400af	
2100-2145	Yugoslavia, Radio Federal	6100eu	11735na	11870na	
2100-2150	Germany, Deutsche Welle	9670eu	9765eu	11785eu	13780as
		15350as	15360as		
2100-2200	Angola, R. Nacional	3355af	9535af		
2100-2200	Australia	5995pa	6060pa	6080pa	11720pa
		11880pa	13705pa	15365as	
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	Canada, RCI Montreal	15325eu	17875eu		
2100-2200	China, Radio Beijing	4130eu	8260eu	9920eu	11500eu
		15170eu			
2100-2200	Cook Islands	11760pa			
2100-2200	Costa Rica, RFPI	13630na	15030na	21465am	
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200 sa	Eq.Guinea, R.East Africa	7190af			
2100-2200	Ghana, Radio 1, Accra	4915do			
2100-2200	Ghana, Radio 2, Accra	7295do			
2100-2200	Hungary, Radio Budapest	6110eu	9835eu	11910eu	
2100-2200	India, All India Radio	7412eu	9910eu	9950eu	11620eu
		11715eu	15265eu		
2100-2200	Japan NHK	11815me	11840eu 1	5430eu	17810as
		17890as			
2100-2200	Luxembourg, RTL	15350va			
2100-2200	Nigeria	3326do	4990do		
2100-2200	Romania, R.Romania Int'l	5955eu	7145eu	9690eu	9750eu
		11940eu			
2100-2200	Russia, R Galaxy, Moscow	9880do			
2100-2200	Russia, Radio Moscow	9685na	11780na	11840na	12040na
		12050na	12070na	13645na	13665na
		15355na	15375na	15405na	15425na
		15485na	15500na	15560na	15580na
		17735na			
2100-2200	Sierra Leone, SLBS	3316do			
2100-2200	Spanish National Radio	6130eu			
2100-2200	Sri Lanka B'casting Corp.	15120as			
2100-2200	Ukraine, Kiev	5960eu	7250eu	7340eu	9600eu
		9635eu	9865eu	15570eu	
2100-2200	USA, CSMonitor Boston	9455as	13625pa	15665eu	17510na
		17555sa			
2100-2200	USA, KTBN Salt Lake City	15590			
2100-2200	USA, KVOH Los Angeles	17775sa			

2100 UTC cont'd

2100-2200	USA, VOA Washington	6040eu	9700eu	9760me	11710me
		11870pa	11960me	15185pa	15205me
		15410af	15495af	15580af	17650af
		17735pa	17800af	17895me	19261af
		21485af	21625af		
2100-2200	USA, WHRI Noblesville	13760am	17830am		
2100-2200	USA, WJCR Upton, Kentucky		7490na		
2100-2200	USA, WMLK Bethel, Penna.	9465eu			
2100-2200	USA, WWCR Nashville	15690am	17535am		
2100-2200	USA, WYFR Okeechobee, FL	7355eu	15566eu	17750af	21525eu
2100-2200	Zambia,Radio Zambia Int'l	9505af	11880af	17895af	
2103-2110 tent	Croatian Radio, Zagreb	7240eu	9830eu	21480eu	
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2130 s	Indonesia, R. Republik	6070do			
2115-2130 mtwhf	United Kingdom,BBC Carib.	15390ca	17715ca		
2115-2200	Egypt, Radio Cairo	9900eu			
2130-2145	Cameroon CRTV Beau	3970do			
2130-2155	Finland, YLE	6120af	11755as	15440eu	
2130-2200	Austria, ORF Vienna	5945eu	6155eu	9870af	
2130-2200	Canada, RCI Montreal	11880af	15150af	17820af	
2130-2200	Ecuador, HCJB Quito	15270eu	17790eu	21455eu	
2130-2200	Israel, Kol Israel	11585eu	11605eu	15100na	15590eu
		15640sa	17575eu		
2130-2200	Kazakhstan, R. Alma Ata	3955do	5035do	5260do	5960eu
		5970eu	7115eu	9505eu	9690eu
		11825eu	15215eu	15250eu	15270eu
		15285eu	15315eu	15360eu	15385eu
		17605eu	17730eu	17765eu	21490eu
2130-2200 smtwhf	Lebanon, King of Hope	6280me			
2130-2200	Lithuania, Radio Vilnius	9675eu	9710eu		
2130-2200	New Zealand, RNZI	17770pa			
2130-2200	United Kingdom,BBC Falk.I	13660sa			
2130-2200	United Kingdom,BBC London	3255af	3955eu	5975ca	6005af
		6180eu	6195as	7325eu	9410eu
		9590na	11750pa	12095eu	15070na
		15260sa	15340pa	15400af	
2140-2150 mtwhfa	Venezuela, Radio Nacional	9540am			
2145-2200	Bulgaria, Radio Sofia	11660na	11720am	15330eu	
2145-2200	Cameroon CRTV Yaounde	4850do			

2200 UTC [6:00 PM EDT/3:00 PM PDT]

2200-2210	Cameroon CRTV Bafoussam		4000do		
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2215	Cameroon CRTV Yaounde	4850na			
2200-2215	Zambia,Radio Zambia Int'l	9505af	11880af	17895af	
2200-2218	Congo, RTV Congolaise	4765do	5985do		
2200-2225	Italy, RAI, Rome	9710as	11800as	15330as	
2200-2230	Albania, Radio Tirana	9760eu	11825eu		
2200-2230	Canada, RCI Montreal	5960na	9755na	11705as	11905na
		13670na			
2200-2230 2	Russia China, Radio Beijing	9740eu			
2200-2230	Czechoslovakia	5930eu	6055eu	7345eu	9605eu
2200-2230 a	Indonesia,Radio Republik	3385do	4805do		
2200-2230	Swiss Radio Int'l	9810sa	9885sa	12035sa	15570sa
2200-2230 s	USA, KGEI San Francisco	15280sa	17750		
2200-2230	USA, VOA Washington	9530eu	11905me	11960me	15225me
		15445me	17885eu		
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2245	USA, WINB Red Lion, Penn.	15185	15195		
2200-2300	Australia	11720pa	11880pa	13705as	15240pa
		15320pa	15365as	17795pa	
2200-2300	Bulgaria, Radio Sofia	11660am	11720am	15330eu	
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2300	Cook Islands	11760pa			
2200-2300	Costa Rica, RFPI	13630ca	15030ca	21465am	
2200-2300	Cuba, RHC Havana	9620va	11705eu	11930va	
2200-2300 sa	Eq.Guinea, R.East Africa	7190af			
2200-2300	Ghana, Radio 1, Accra	4915do			
2200-2300	Ghana, Radio 2, Accra	7295do			
2200-2300	India, All India Radio	7412eu	9910eu	9950eu	11620eu
		11715eu	15265eu		
2200-2300	Luxembourg, RTL	15350va			
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300	New Zealand, RNZI	17770pa			
2200-2300	Nigeria	3326do	4990do		
2200-2300	Russia, Radio Moscow	11710na	12050na	15355na	15405na
		15410na	15425na	15485na	17735na
		21690na			
2200-2300	Sierra Leone, SLBS	3316do			
2200-2300	Singapore, SBC1	5010do	5052do	11940do	
2200-2300	Taiwan, V. of Free China,	17750eu	21720eu		
2200-2300	Turkey, Voice of	9445na			
2200-2300	UAE Radio Abu Dhabi	9605na	11965na	13605na	
2200-2300	United Kingdom,BBC London	5975na	6195as	7325am	9410eu
		9570pa	9590na	9915ca	11750sa
		11945as	11955as	12095na	15070na
		15260sa	15340as	15400af	17830as
2200-2300	USA, CSMonitor Boston	9465na	13625as	15405as	15665eu
		17555am			
2200-2300	USA, KTBN Salt Lake City	15590			
2200-2300	USA, VOA Washington	7120as	9770as	11760as	15185au
	15290au 15305au	17735au	17820au		
2200-2300	USA, WHRI Noblesville	13760na	17830sa		
2200-2300	USA, WJCR Upton, Kentucky		7490na		
2200-2300	USA, WRNO New Orleans	15420na			
2200-2300	USA, WWCR Nashville	12160na	15690na		
2200-2300	USA, WYFR Okeechobee, FL		17750eu	21525eu	
2230-2300 mtwhf	Congo, RTV Congolaise	4765do			
2230-2300	Sweden	6065eu			
2230-2300	USA, VOA Washington	9530eu	11905me	11960me	17885me
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	USA, WINB Red Lion, Penn.	15145eu			
2245-2300	Vatican Radio	9600au	11830au	15090au	

English language

shortwave guide

2300 UTC [7:00 PM EDT/4:00 PM PDT]

FREQUENCIES

2300-2305	Ghana, Radio 1, Accra	4915do			
2300-2305	Ghana, Radio 2, Accra	7295do			
2300-2315	Bulgaria, Radio Sofia	11660am	11720am	15330eu	
2300-2330	Canada, RCI Montreal	11940sa	15235na		
2300-2330 varies	Croatian Radio via WHRI	7315na	9495na		
2300-2330	Lithuania, Radio Vilnius	9710na	10344na	11780na	13645na
		15580na			
2300-2330 as	Norway	11795am			
2300-2330	United Kingdom,BBC London	5975na	6175na	6195as	7145as
		9410eu	9570pa	9590na	9915sa
		11750sa	11945as	11955as	12095na
		15070na	15260sa	15340pa	15400af
2300-2350	North Korea	11700am	13650am		
2300-2350	Turkey, Voice of	9445na			
2300-0000	Australia	11720pa	11880pa	15240pa	15320pa
		15365as	17795pa		
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-0000	Cook Islands	11760pa			
2300-0000	Costa Rica, AWR	9725ca	11870ca		
2300-0000	Costa Rica, RFPI	13630na	15030na	21465am	
2300-0000	Guam, KSDA Guam	15610as			
2300-0000	India, All India Radio	9910as	11715as	11745as	15110as
		15145as	17830as		
2300-0000	Japan NHK	11735eu	11815am	15195as	17810pa
		17840va			
2300-0000	Luxembourg, RTL	15350va			
2300-0000 smtwha	Malaysia, RTM Radio 4	7295do			
2300-0000	New Zealand, RNZI	17770pa			
2300-0000	Russia, Radio Moscow	11710na	12050na	15355na	15405na
		15410na	15425na	15485na	17570na
		17735na	21690na		
2300-0000	Sierra Leone, SLBS	3316do			
2300-0000	Singapore, SBC1	5010do	5052do	11940do	
2300-0000	South Africa, Radio Orion	4810af			
2300-0000	Thailand	4830as	9655as	11905as	
2300-0000	UAE Radio Abu Dhabi	9605na	11965na	13605na	
2300-0000	USA, CSMonitor Boston	9465na	13625as	15405af	15665eu
		17555af			
2300-0000	USA, KTBN Salt Lake City	15590na			
2300-0000	USA, VOA Washington	7120as	9770as	11760au	15185au
		15290au	15305as	17735as	17820as
		9530me	11905me	11960eu	17885me
2300-0000	USA, WHRI Noblesville	9495na	13760sa		
2300-0000	USA, WINB Red Lion, Penn.	15145eu			
2300-0000	USA, WJCR Upton, Kentucky		7490na		
2300-0000	USA, WRNO New Orleans	7355na			
2300-0000	USA, WWCR Nashville	12160na	15690		
2315-0000 vl	Iraq, Radio Iraq Int'l	11945na	17740sa		
2330-0000 as	Canada, RCI Montreal	11940sa	15235sa		
2330-0000	Canada, RCI Montreal	5960am	9755am	13670am	
2330-0000 a	Colombia, R.Nacional	11822.5	17865am		
2330-0000	Iran, Islamic Republic	9022am	15260am	15315am	
2330-0000 m	Sri Lanka B'Casting Svc	15425am			
2330-0000	United Kingdom,BBC London	5975na	6175na	6195as	7145as
		7325na	9570pa	9590na	9915sa
		11750sa	11945as	11955as	12095na
		15070na	15260sa	17830as	
2330-0000	Vietnam, Voice of	9840as	12020as	15010as	
2330-2355	Belgium, BRT Brussels	9930na	13655na		
2335-2345 smtwhf	Greece, Voice of	7450eu	9425sa	11645sa	

SELECTED PROGRAMS

Sundays

2305 BBC: World Business Review. The previous week's news and upcoming events.
2313 Radio Australia: Sports Report. See S 1313.
2315 BBC: Music. Program details not available at press time.
2330 Radio Australia: Business Report. A look at the day's business developments.
2336 BRT, Brussels: P.O. Box 26. See S 0636.
2349 BRT, Brussels: Musical Roundabout. See S 0649.

Mondays

2305 BBC: World Business Report. The latest news from the markets worldwide.
2313 Radio Australia: Sports Report. See S 1313.
2315 BBC: Talks. Religious experiences recorded in poetry are the fare for "Hallowed Ground" (through August 10th).
2325 BBC: Talks. "The Man Behind The Word" looks at historical figures like Boycott, Guillotin, and Mesmer (through August 10th).
2330 BBC: Multitrack 1: Top 20. Tim Smith presents the smash singles on the UK pop music charts.
2330 Radio Australia: Business Report. See S 2330.
2334 BRT, Brussels: Press Review. See M 0634
2337 BRT, Brussels: Belgium Today. A review of current affairs and events.
2342 BRT, Brussels: Focus On Europe. Happenings, events, and politics in Europe.
2347 BRT, Brussels: Sports. A roundup of events in the sports world.

Tuesdays

2305 BBC: World Business Report. See M 2305.
2313 Radio Australia: Sports Report. See S 1313
2315 BBC: Music. "Concert Hall" features classical music from the world's great concert halls (7th/14th); "From The Proms" broadcasts highlights of the concert series from London's Royal Albert Hall.
2330 Radio Australia: Business Report. See S 2330.
2334 BRT, Brussels: Press Review. See M 0634.
2337 BRT, Brussels: Belgium Today. See M 2337.
2342 BRT, Brussels: Around The Arts. Developments in the arts in Belgium.
2347 BRT, Brussels: P.O. Box 26. See S 0636.

Wednesdays

2305 BBC: World Business Report. See M 2305.
2313 Radio Australia: Sports Report. See S 1313.
2315 BBC: From Our Own Correspondent. See S 0330.
2330 BBC: Multitrack 2. Graham Bannerman presents new pop records, interviews, news, and contests.
2330 Radio Australia: Business Report. See S 2330.
2334 BRT, Brussels: Press Review. See M 0634.
2337 BRT, Brussels: Belgium Today. See M 2337.
2342 BRT, Brussels: Living In Belgium. Everyday life in the low countries.
2347 BRT, Brussels: Green Society. The environmental concerns of Belgians.

Thursdays

2305 BBC: World Business Report. See M 2305.
2313 Radio Australia: Sports Report. See S 1313.

2315 BBC: Music Review. News and views from the world of classical music.
2330 Radio Australia: Business Report. See S 2330.
2334 BRT, Brussels: Press Review. See M 0634.
2337 BRT, Brussels: Belgium Today. See M 2337.
2342 BRT, Brussels: Economics. A review of economic developments.
2350 BRT, Brussels: North-South. Development in Africa and other Third World regions.

Fridays

2305 BBC: World Business Report. See M 2305.
2313 Radio Australia: Music/Information. See S 0330.
2315 BBC: Worldbrief. A roundup of the week's news headlines and developments.
2330 BBC: Multitrack 3. News and releases from the British alternative music scene.
2334 BRT, Brussels: Press Review. See M 0634.
2337 BRT, Brussels: Belgium Today. See M 2337.
2342 BRT, Brussels: Around The Arts. See T 2342.
2350 BRT, Brussels: P.O. Box 26. See S 0636.

Saturdays

2305 BBC: Words Of Faith. See S 0309.
2310 BBC: Book Choice. See H 0140.
2313 Radio Australia: Back Page. See S 0313.
2315 BBC: A Jolly Good Show. See T 1515.
2330 Radio Australia: At Your Request. See S 0130.
2333 BRT, Brussels: Press Review. See M 0634.
2335 BRT, Brussels: Radio World. See M 0637.
2340 Radio Nacional, Bogota: Feature. Topical programming on various issues.
2343 BRT, Brussels: Tourism In Flanders. See M 0647.
2350 BRT, Brussels: Record Of The Week. See A 0650.
2350 Radio Nacional, Bogota: Colombia DX. News for shortwave radio listeners.
2353 BRT, Brussels: P.O. Box 26. See S 0636.

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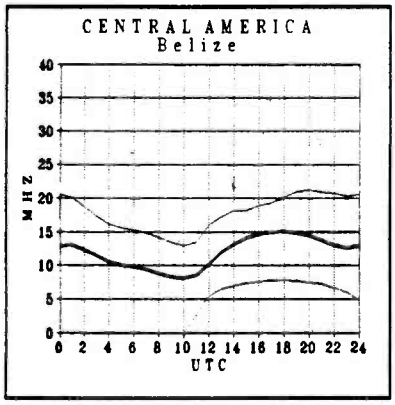
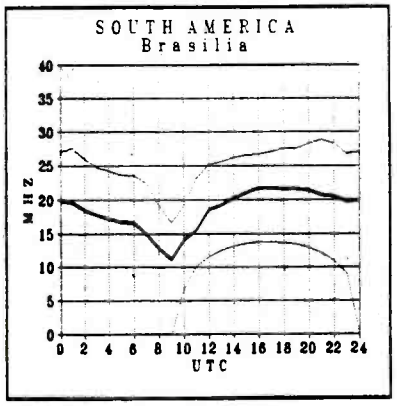
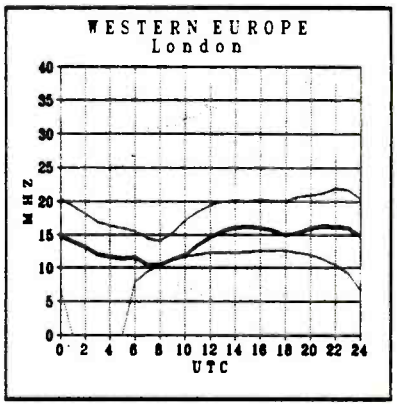
Radio-Electronics 7MT02

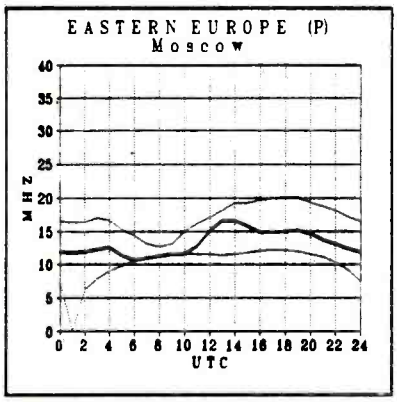
Propagation conditions: Eastern United States

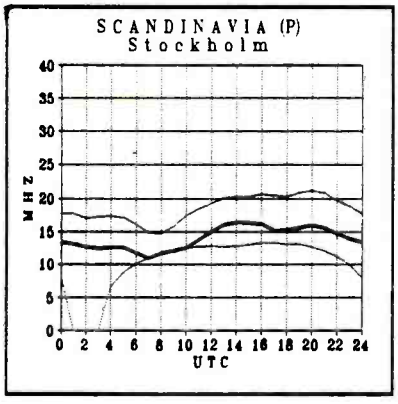
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.

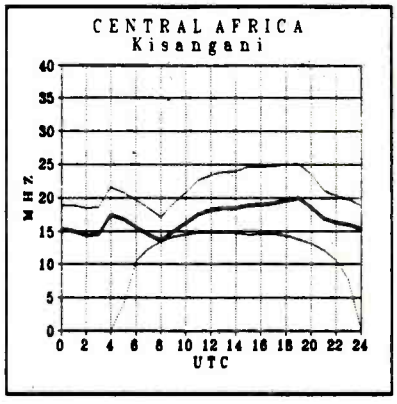


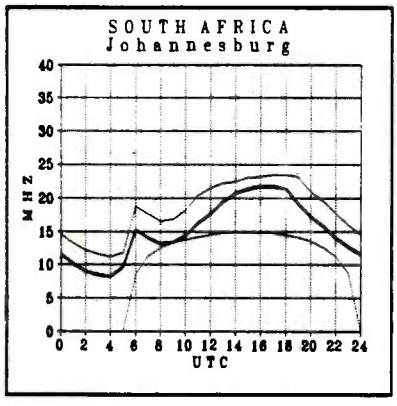


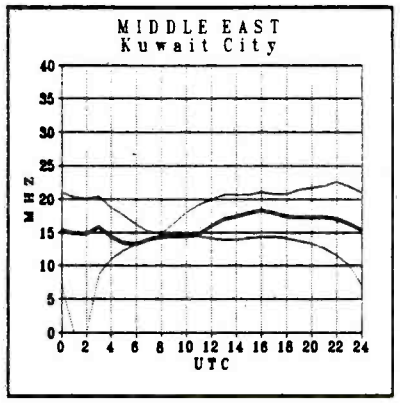


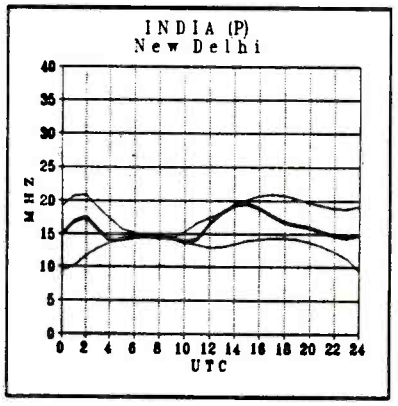


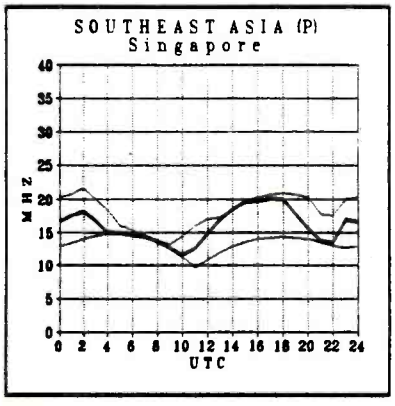


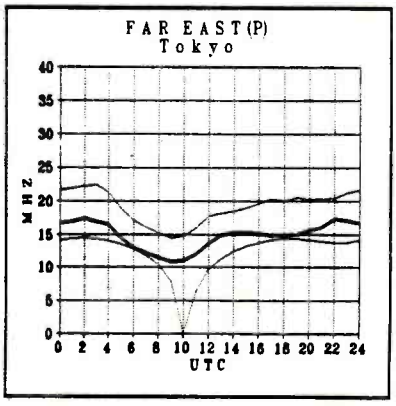


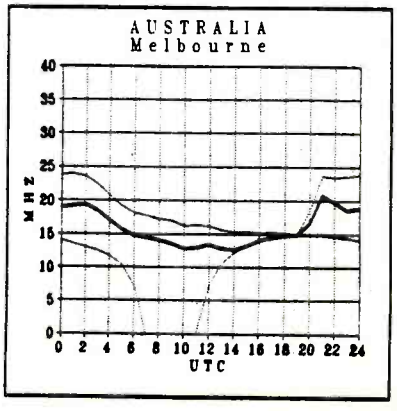






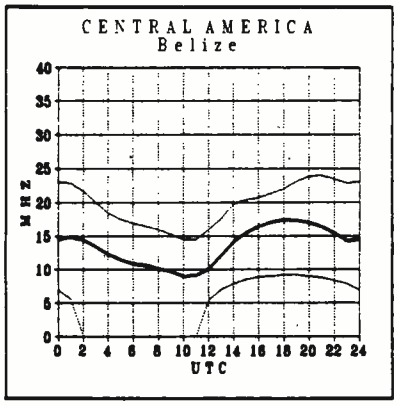


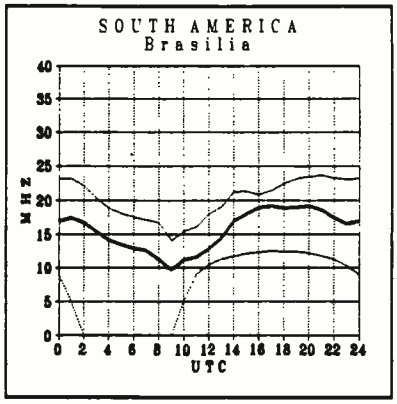


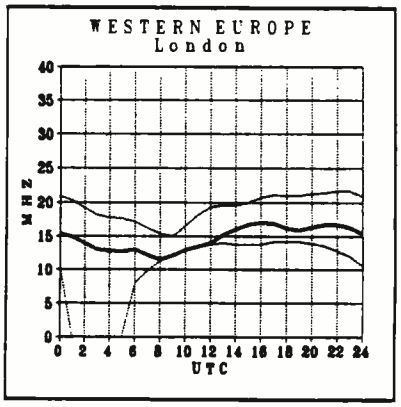


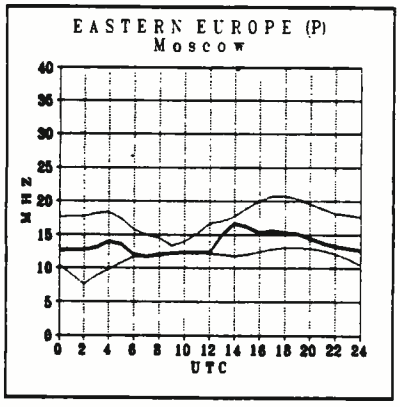
Propagation Conditions: Western United States

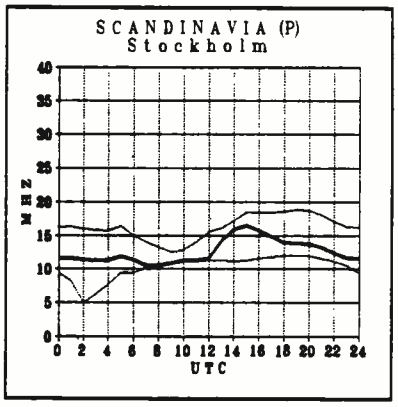
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.

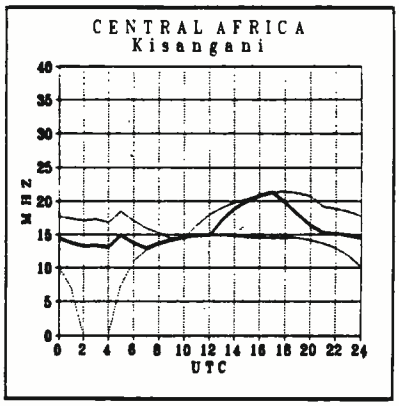


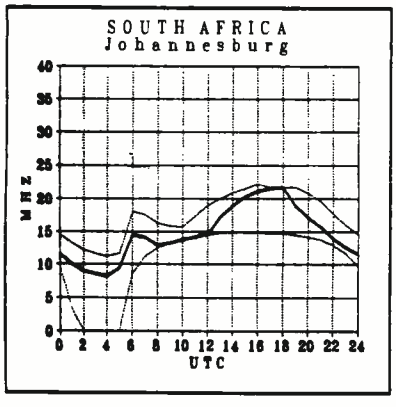


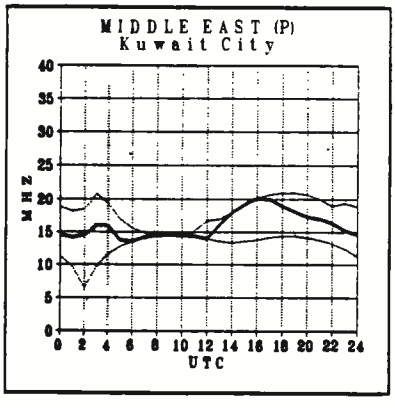


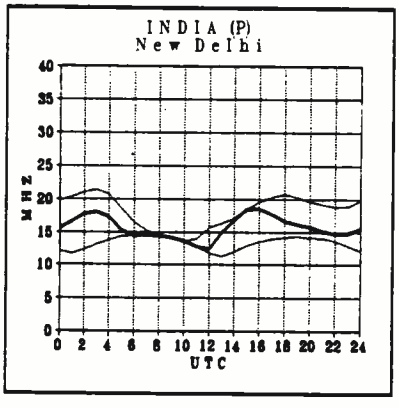


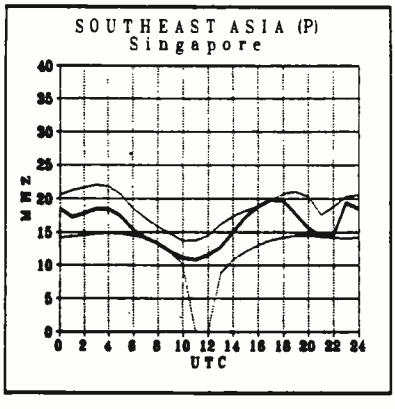


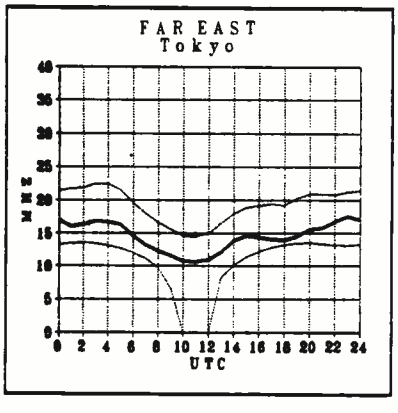


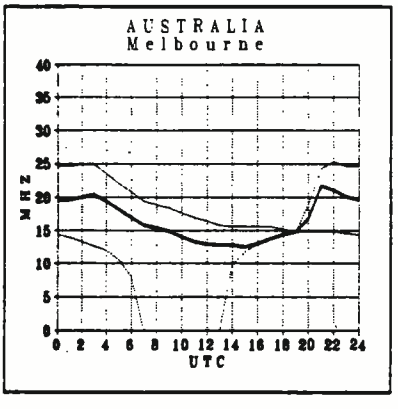






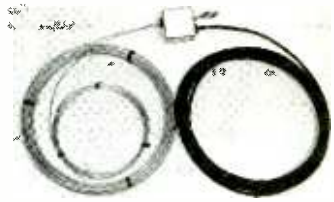






what's new?

Larry Miller



BW-60

All About Ham Radio

"All About Ham Radio is written in a friendly, humorous style without the stiff formality, wordiness, and extensive math that makes so many other books on ham radio boring" — so says the promo on the back cover of the book.

In fact, the main difference between Harry Helms' *All About Ham Radio* and most other "Intro to Ham Radio" books is that Helms' version is written in a conversational style. The material is still the same—physics doesn't change and the math doesn't go away.

Helms is, however, a master of the conversational style and that is probably the book's main selling point. Still, Helms can be incredibly condescending. For example, regarding the publisher of *73* magazine, Helms asks, "What do I think of Wayne Green?" (just can't wait to find out!)

Harry also lets us in on "a secret: the written exam requirement (for a ham radio license) is a good filter to eliminate the sort of riff-raff that messed up CB radio for everyone."

Clearly, Helms has not broken through one of ham's main walls—the attitude of superiority that an FCC license apparently bestows on its recipients.

Still, *All About Ham Radio* is a good, thorough book that covers virtually every aspect of ham radio that you can think of, from digital modes to polarization. If you've been thinking about studying for a ham exam, this is the book for you.

All About Ham Radio is available for $19.95 plus $3.00 shipping. The address is HighText Publications Inc., 7128, Miramar Road, Suite 15, San Diego, CA 92121. Please tell them that *Monitoring Times* sent you.

Basic Wire Antenna

Getting the most out of a shortwave radio is largely dependent on the antenna that is connected to it. Unfortunately, high quality antennas usually come with fairly hefty price tags.

Electron Processing claims to have solved the price problem with their new 60' long basic wire antenna (BW-60). The antenna, which the manufacturer says "covers all SWL bands from 2 MHz to 30 MHz," costs only $35.00 plus $5.00 shipping.

The antenna is comprised primarily of two wire elements of different lengths joined together at the feed point in a compact coupling box. The antenna can be installed in numerous configurations requiring from one to three supports. The BW-60 comes with 25 feet of coax feedline and can be ordered by calling 616-228-7020 or writing P.O. Box 68-MT, Cedar, Michigan 49621.

Filtering Out the Broadcast Band

Northwest Communications Laboratories has introduced a line of AM broadcast band rejection filters for the shortwave listening market. The products are designed for the listener who is experiencing receiver overload from nearby AM transmitters.

Who needs one of these filters? Just about anyone who lives in an urban area with lots of high-powered broadcasters. Listeners in less congested areas who happen to be unfortunate enough to live in the proximity of an AM radio station can also suffer from the same problems.

There are two models: the 100, which allows clean reception below the AM broadcast band and the 200, which is used for reception above the AM broadcast band. Both units provide 40dB of broadcast band attenuation.

Either version is available for $49.95 with either UHF, RCA phono or binding post connectors. The filters are also available for $55.95 with BNC connectors or $59.95 for one with an "N" connector. Northwest Communications Laboratories has offered a 10% discount to some groups. You may want to inquire if this discount is also available to *Monitoring Times* subscribers.

For more information, contact NCL at 503-923-2540 or write to Bob Cosentino at 813 Southwest Highland, Suite C-310-MT, Redmond, Oregon 97756.

Cheap Packet Thrills

MFJ is touting their new model 1271 TNC as the "fastest, easiest and least expensive way yet to join the packet [radio] action." If you have a Commodore 64/128 computer and an HF handheld or HF SSB transceiver, you're in luck. It simply plugs into the computer's rear cassette port. It works VHF packet at 1200 baud and HF packet at 300 baud.

The MFJ 1271 is a high-performance modem/TNC with DCD circuit and adjustable threshold control to reduce noise susceptibility and increase your QSO/connect success, especially on the HF bands. A DCD LED is included to indicate when you are receiving signals properly.

Says MFJ, "You can't miss, even if you are a packet newcomer!"

You can order the MFJ-1271 for just $49.95 by visiting your local ham radio dealer or by calling MFJ direct at 1-800-647-1800. Please tell them that *Monitoring Times* sent you.

The International Callsign Directory

"Missionary, this is Black Eagle; do you copy Spartan on this net?" Calls like this may be heard continuously throughout the HF and VHF/UHF monitoring ranges. But who are they?

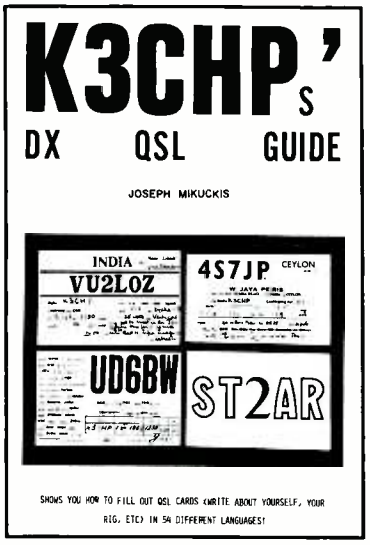
After years of collecting and verifying tactical callsigns, noted *MT* columnist Gayle Van Horn has finally published the most exhaustive list of tactical callsigns and their identifications ever assembled for shortwave and scanner listeners.

The massive directory's 250 pages list agencies and worldwide locations with tactical identifiers for U.S. Air Force, Navy, Army, Customs, Secret Service, Marine Corps and foreign military.

Internationally registered callsigns and their users around the globe are listed as well, with comprehensive entries from coastal maritime stations, embassies, merchant marine, aviation, NASA, U.S. and foreign military, Interpol, MARS and many more.

A worldwide list of low frequency, non-directional beacons (NDBs) with callsigns and locations is included as well.

For utilities buffs, this book is a must! *The International Callsign Handbook* is available for $24.95 plus shipping from Grove Enterprises and Grove dealers.



Foreign QSL Requests

K3CHP's DX QSL Guide, a book which is far from new but which may be of interest to hams and other QSL hunters, has been reprinted by author Joseph Mikuckis. This unusual guide contains only twelve sentences...repeated in 54 languages!

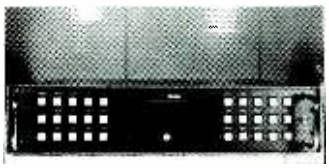
The majority of sentences describe the writer and *his* equipment ("...the sentences have been rendered correct only under the assumption that the correspondence takes place between two males"). Many of the others are courteous pleasantries. Only two sentences actually request a QSL of the addressee.

If you have exhausted the IRC-SASE-money routes, then writing your request in the language of the station may produce the kind of success the author claims.

To obtain a copy of this unique guide, send $9.95 to Joe Mikuckis, K3CHP, 6913 Furman Parkway, Dept. MT, Riverdale, MD 20737.

Universal M8000

The popular Infotech M7000 multimode demodulator has been replaced by this update from Universal Radio. Adaptable to a wide variety of digital modes heard on shortwave, scanners and satellites, the M8000 decodes standard RTTY, packet, ASCII, FDM, FEC-TOR, ARQ-TOR, Morse, WEFAX and even diplomatic Piccolo.



Because it has its own microcomputer, no host computer is necessary; the M8000 connects between your receiver's audio output jack and a printer or VGA monitor.

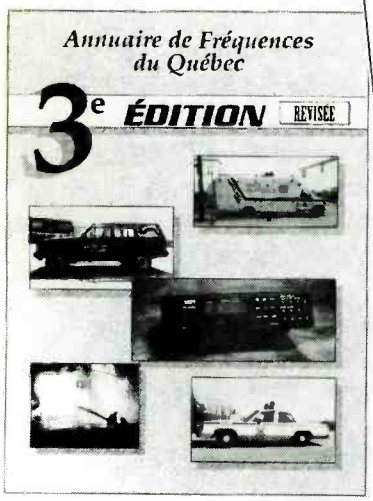
Equipped with LED tuning indicators, the M8000 operates from 120/240 VAC, 50/60 Hz and carries a one-year warranty.

The M8000 Decoder is available for $1299 from Universal Radio, Grove Enterprises and many other *MT* advertisers.

Radio Adventure on Tape

The National Radio Club has released Volume 2 of their "After Dark" cassette series. Packed in an attractive plastic case are four ninety-minute cassettes. The fare on each tape varies from an interview with John Vodenik of the Voice of America's Bethany, Ohio, Relay Station to what is described as "a variety of what's happening in radio, formats, 'rule primer,' 'for beginners,' and the 1991 station of the year, KKOB-770."

Also included are airchecks, English language broadcasts on shortwave, improving FM reception and an aircheck from Laser 558. The whole package is 360 minutes of radio adventure and costs only $9.50 from the National Radio Club, NRC Publications, P.O. Box 164-MT, Mannsville, New York 13661-0164.



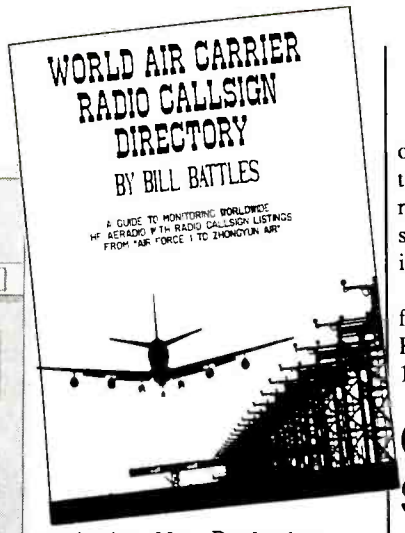
Quebec Frequency Directory

The 3rd edition of *Annuaire de Frequences du Quebec* is now available. Unfortunately, we can't tell you a lot about it because it's written in French. We do know this: the book covers scanner frequencies for the province of Quebec. There are 6,700 frequencies listed (including federal government) arranged by-frequency and by-location.

Other items include lists of 10-codes and even instructions on how to restore cellular phone coverage to the Uniden BC760XLT and BC950XLT (in English). Editor Gilles Thibodeau has acquired a respected reputation among hobbyists so the information is guaranteed to be first-rate. The price is $17.95. You can get yours by writing Radio Scanner Enr., C.P. 193-MT, Lac-Megantic, Quebec G6B 2S6.

HF Aero Directory

Bill Battles is well-known in the monitoring community for his extraordinary expertise and leadership in the field of utility



monitoring. Now Battles has entered the publishing field with a book titled, *World Air Carrier Radio Callsign Directory*. It's subtitled, "A Guide to Monitoring Worldwide HF [shortwave] Aeradio with Radio Callsign Listings from Air Force 1 to Zhongyun Air."

That only touches the surface of Mr. Battles' excellent work. Included are sections on decoding what you hear, getting QSLs, major World Air Route Areas, Long Distance Operational Control Stations, plus interesting tidbits like flight test frequencies, offshore oil rig support and rescue frequencies, speed, temperature and distance formulas—even airline company mailing addresses. In short, the book has it all.

Highly recommended for all shortwave aero monitors, the 96 page *World Air Carrier Radio Callsign Directory* is available for $22 postpaid from W.J. Battles Enterprises, P.O. Box 133-MT, East Kingston, New Hampshire, 03827-0133.

A Railfan's Guide

A Railfan's Guide to Scanners and Scanning by Vincent Reh is not precisely a frequency directory, but a survey of radio communications as used by the railways and how to monitor them—dispatch, alarms, security, detectors, telemetry and more.

Reh includes additional chapters on hints to get the most out of your monitoring and, while the material is intended for railfans, it is eminently useful for scanner listeners with other interests as well.

The guide is only $6 postpaid from Vincent Reh, 6417 Freeman Rd., Dept. MT, Byron, NY 14422.

Official Scanner Guide—Connecticut

The 3rd edition of Bob Coburn's *Official Connecticut Scanner Guide* is now available and, as to be expected from Coburn and associates, the book is a whopper. Included in its 350+ pages are frequencies for fire, local police, state police, sheriff, ambulance and local government.

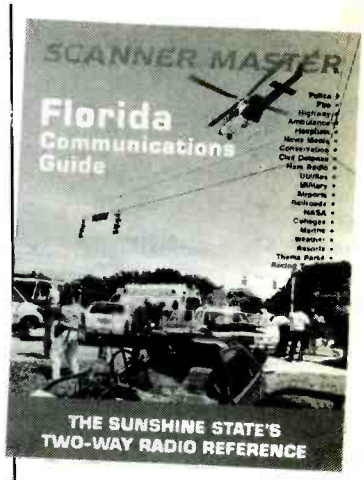
But that's not where the action stops. Also included are aircraft frequencies, security agencies, ski patrols, 800 MHz business, notification systems, hospitals, railroads, marine radio, power companies—you name it. It's in there. And it's hot.

You can get your copy of the *Official Connecticut Scanner Guide* from your favorite radio bookseller or direct from the publisher for $17.95 plus $3.05 shipping. The address is P.O. Box 712-MT, Londonderry, New Hampshire 03053.

Florida Scanner Guide

The Florida Communications Guide by Bob Cheek (not to be confused with Bill) is a detailed guide to communications in the Sunshine State. The book is designed with the professional public safety officer and the serious scanner hobbyist in mind.

The guide is broken down into the county groupings



comprising the state's own communications regions. Each section contains actual documentation from the state law enforcement and the statewide emergency medical service's radio plans. These documents discuss public safety radio systems of every county in Florida including radio system types, repeaters, cooperative dispatch center locations, jurisdictions, etc.

Listings for practically all public safety radio licenses are included, as are business radio licenses (excluding 800 MHz trunked). Also included are PL tones, a frequency sequence sort, listings of emergency medical service providers and hospitals, 10-codes, unit designators and more.

To get your copy, contact your favorite radio bookseller or write Scanner Master at 2 Indian Ridge Road, Dept. MT, Natick, Massachusetts 01760 for more information.

SCPC Satellite Audio Receiver

Universal Electronics has released the SCPC-100 satellite audio receiver for reception of the hundreds of SCPC channels on satellite. The unit, says UE's Tom Harrington, "is ideal for the home dish owner (TVRO) as this unit is priced very low as compared to the commercial SCPC receivers. Retail price is just $399.00."

The SCPC-100 audio receiver is simple to hook up and takes only one connection to the regular home satellite receiver—all of which can be accomplished in about three minutes. If you'd like more information on the Universal Electronics SCPC-100 receiver, contact Tom Harrington at Universal Electronics, Inc., 4555 Groves Road, Suite 13C-MT, Columbus, Ohio 43232. Their phone number is 614-866-4605. The unit is also available from a number of satellite dealers. A review will be appearing in the August "Satellite TV" column.

CB Antenna

"Outstanding in performance" is how Robert Provost describes his new CB antenna, the CP 40. The CP 40, says Provost, improves skip and ground wave communications better than any omni-directional or co-phased set of antennas. The theory behind the CP 40 is circular polarization, an idea Provost said he borrowed from FM and TV broadcasters who were faced with the problem of getting out to both car (vertically oriented) and home (horizontally oriented) antennas.

The CP 40 can be assembled in 15 minutes and is made in the USA. It's tunable from 26 to 30 MHz. The antenna is $99.50 plus $9.95 shipping from Robert R. Provost, 220-MT Riverside Avenue, #E-3, Burlington, Vermont 05401.

It's Only a Magazine

The ad copy from *Broadcasting Magazine* is enough to choke a horse: "Being Number One. That *is* the idea, isn't it? For you to be first. The best. Tops. To outperform the others. To win..." Yeah, we get the idea.

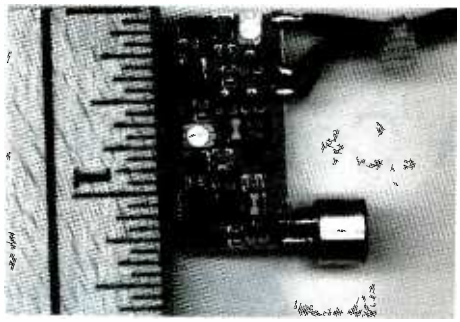
We're not sure if subscribing to *Broadcasting Magazine* is going to change your life, but if you happen to be interested in keeping up with the world of professional domestic broadcasting, a subscription to *Broadcasting* may be in order.

In the past, the price made subscribing unlikely for any except the most wealthy or the most dedicated. *Broadcasting* is now offering a full 52 issue (one year) subscription at what they call a "rock-bottom rate." The price is $48.00 (still not cheap enough to purchase on a lark but better than before) and the address is P.O. Box 715, Brewster, New York 10509-9874 or you can call 1-800-323-4345. If you're unsatisfied, you can cancel the subscription at any time for a refund on any issues not yet mailed.

Review

Deco Wireless Microphone

by Bill Grove



Intelligence and counter-intelligence has always fascinated me, from the suave and debonair approach of James Bond to the real-life intelligence gathering of the FBI and CIA. There is a glamour and a fascination in knowing more than everyone else. The ready availability of bugs, masquerading as wireless mikes, baby monitors and intrusion detectors makes many childhood dreams come true.

The Deco VA-75 is capable, according to the manufacturer, of transmitting a signal up to a mile away, yet the device itself is only a little over an inch long and a quarter of an inch thick.

The microphone is so sensitive that I could hear a whisper at fifty feet clearly and succinctly on a standard FM radio tuned to its frequency (it can be set anywhere from 80-130 MHz). A separate adjustment allows peaking the output to match the antenna.

Years ago, bugs were small boxes that were worn or placed as inconspicuously as possible, but they had to be located near their targets. Now, with the aid of new technology, bugs simply have to be in the room.

From one location I heard the office manager in his office on the phone, one of our secretaries taking an order and other workers up and down the halls. Kinda makes you wonder why they told me that I couldn't keep this bug, eh?!

The VA-75 is powered by a 9 volt battery (not included) and its 15" wire antenna can be bent as necessary. Power output ranges from under 75 milliwatts at 9 volts to 100 milliwatts at 12 volts, and it will continue to transmit even when the battery drains down to only 3 volts. But remember, it's against the law to snoop without a warrant!

The VA-75 miniature transmitter, $49.98 plus $1.50 shipping from Deco Industries, Box 607, Dept. MT, Bedford Hills, NY 10507.

Tell them you saw it in Monitoring Times!

Bob Grove, WA4PYQ

What Do You Miss on an Entry-Level Scanner?

A Comparison of the Realistic PRO-59

All of us have wondered from time to time just what we would compromise if we spent much less money on a scanner. The Realistic PRO-59 makes a good case for a low end scanner—if you are willing to make a few sacrifices in features.

The PRO-59 has excellent audio, both in quality and loudness; sensitivity and selectivity are as good as any other scanner on the market; unwanted channels may be temporarily locked out; a BNC connector is provided for external antenna attachment; there is a 1/8" jack for an external speaker; no scanner is easier to program; weather channels are preprogrammed; it runs off 12 VDC and an AC wall adaptor is included.

So what could you be missing?

For one thing, there are only eight memory channels; in a large city, many listeners utilize all of their 100-400 channels, some wishing for more.

For another, frequency ranges are only 137-174 and 406-512 MHz; no 30-50 MHz low band, 118-137 MHz aircraft or 806-960 MHz coverage.

There is no search capability, an amenity on most scanners which allows the user to automatically look for active, unknown frequencies on a band.

All channels have rescan delay, certainly the most desirable way to wait for replies on a channel before the scan sequence resumes, but there are some instances where delay is undesirable and the PRO-59 won't let us switch the function off.

And finally, the display has only a one-character readout, the channel number; to read the frequency on any memory channel, you must press "REVIEW" and remember the digits as they scroll by one-by-one.

But this critique should not be misconstrued as scanner bashing; quite to the contrary. Within its intentional limitations, we consider the Realistic PRO-59, at $99.95 from Radio Shack outlets, to be an outstanding value for someone on a low budget. If you are interested in listening to your local public safety frequencies and you wondered what the difference was between a scanner at $300 and one at $100, now you know.

Next Month

Watch this column for a sneak preview of a new hand-held scanner with extended frequency coverage.

MT

Radio Pioneers: Karl Ferdinand Braun

By Everett L. Slosman

Depending on your choice of which person, event or scientific discovery deserves the credit, broadcasting has already or will soon enter its first hundred years. The "father of radio" title can be claimed by a dozen people all with valid credentials.

Almost 100 experimenters, scientists and dabblers pushed the limits during the period of 1800 to 1935, making broadcast communications a major 20th century accomplishment. We salute those who moved electricity from a laboratory curiosity to the foundation for modern communications.

This month we look at pioneer Karl Ferdinand Braun, a German physicist whose contributions include the crystal rectifier, magnetic antenna coupler, and oscillograph, the forerunner of the oscilloscope.

Born June 6, 1850, in Fulda, Hesse-Nassau, he was 20 years old and working on a doctorate from the University of Berlin when Otto von Bismark defeated Napolean III and formed the German Empire under Deutscher Kaiser Wilhelm I.

Scientific inquiry replaced philosophy and theology at the universities of Berlin, Karlsruhe, Leipzig, Marburg, Tubingen, and Wurzburg where grueling courses produced a generation of noted investigators.

Braun wrote his doctoral dissertation on vibrations in elastic rods and strings under the close scrutiny of Herman Ludwig Helmholtz, then considered one of Germany's best physicists.

Once Braun had his Ph.D., his academic career moved along a typical track; instructorships at Wurzburg, Leipzig, and Marlburg followed by an appointment as Professor of Physics at the Technical University of Karlsruhe.

In 1880, he went to Strasbourg, then, five years later, to Tubingen where he founded a Physical Institute. Braun returned to Strasbourg in 1895, where he stayed until 1916.

Intrigued with the electrical properties of metal sulfides in mineral form, he expanded on the work of Munk Af. Rosenheld who noted back in 1837 that certain crystals easily conducted electrical current.

Some had excellent one way paths and acted as rectifiers; converting alternating to direct current. This discovery proved important to 1874 electrical research such as measuring substance conductivity. However, it had little commercial use for 25 more years until the galena crystal replaced mechanical coherer detectors in radio receivers.

Braun modified the cathode ray tube in 1897 so he could study high frequency alternating currents. Using the voltage's electromagnetic field, Braun shifted the electron beam along the tube's face producing amplitude and frequency traces.

A rotating mirror in Braun's tube resulted in a usable graph, so this laboratory instrument was called the oscillograph. It became the linear ancestor of the modern oscilloscope and the tv picture tube.

But, Braun's most applicable contribution resulted in a practical modification to Marconi's antenna system.

Puzzled by difficulties encountered while trying to increase wireless transmissions beyond a 15 kilometer distance, Braun discovered conventional scientific wisdom did not work. In theory, lengthening the spark gap would increase transmitter power. But, just the opposite happened.

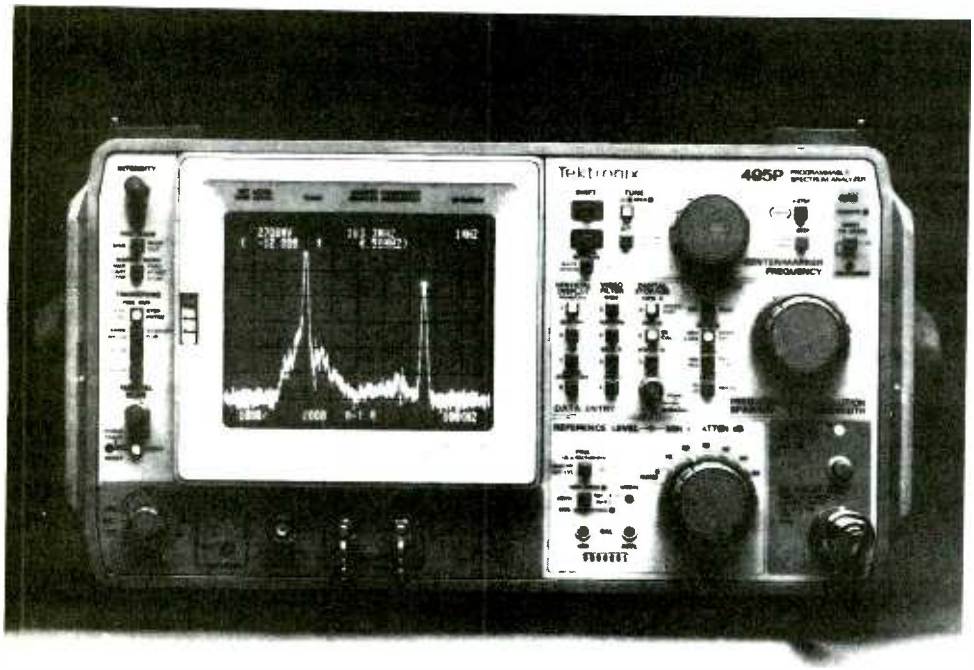
The spark eventually grew so long, diminishing efficiencies actually produced a power decrease. However, magnetically coupling the transmitter to the antenna through a transformer boosted power efficiencies. Magnetic couplers received a patent in 1899 and they eventually led to higher-powered stations.

Magnetic coupling ignited transmitter experimentation and helped develop directional antennae. Experiments resulted in today's commercial radio, radar, and television.

Research purist Karl Ferdinand Braun and wireless promoter Guglielmo Marconi, in a rare juxtaposition of academic excellence and business acumen, shared the 1909 Nobel Prize for Physics.

Braun came to this country in 1916 to testify in a series of patent infringement suits. Though his only "suspicious activity" was courtroom testimony, he was detained as a non-resident alien after the United States entered World War I.

Braun died April 20, 1918, in Brooklyn, NY.



Braun's contributions aided in the development of the oscilloscope.

Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

• Grundig Aims for the Campers

• DAK's Latest Portable Now Available

With all the brouhaha about shortwave radio during the Gulf War, it was probably inevitable that there would be an influx of cheap old-technology radios.

Here's another, this time from a firm that should know better—Grundig. When Grundig first opened up shop in California, its aim was to be "the Mercedes-Benz of shortwave radios." A great idea, and their Satellit series has conformed to that noble objective. Their Yacht Boy series, however, have been overpriced vis-a-vis such competition as Sangean, and some of their lower-priced models have been just plain dogs.

Light of Your Life

Take their latest, the Explorer II, which sells in the Heartland catalog for the modest price of $54.50, including shipping. DAK has shown that for this price you can have an acceptable digital model, but Grundig has taken the "Ginsu knives" marketing approach and sells the Explorer II as a world band radio, cassette player, AM, FM...and flashlight and siren. It sounds too good to be true, and it is.

Let's start with the good news. The flashlight lights, and the electronic siren puts out enough volume to be of some use in woods or camping emergencies. FM performance isn't shabby, either, and AM is okay. The cassette player works reasonably well, although, oddly, it has no reverse.

Short on Shortwave

But as to the Big Ginsu Knife on shortwave, it's hard to imagine anything much worse. There is no digital readout, and the analog readout indicates only meter bands—from 49 (6 MHz) to 16 (18 MHz). There's no bandspread or vernier, either, and a given band with dozens of stations has to be tuned over a mere quarter-inch range. It takes a safecracker's touch just to tune in a station, and as there's no readout you have to wait for an ID or familiar programming to decipher which station you've got.

Enough? No way. Once you've gone through this exercise, if you put the radio down and take your hand off the case, the lack of hand capacitance sometimes causes it to drift to another channel. The station you struggled so hard to bring in vanishes, possibly to be replaced by another!

Sensitivity is mediocre, selectivity awful. But there is one redeeming grace: audio quality. It's not half bad, and with a powerful station out in the clear, reception can be downright pleasant. Unfortunately, there aren't many such stations to be found.

Great Toy for Kids

Withal, for kids playing out in the woods, especially at night, the Explorer II could be a fun toy. Many of us graying grouches got our start in shortwave being enticed by those squeaky signals heard on awful family radios.

So, is this for *MT* readers? Hardly. But for youngsters who could use something different in their next gift basket, the Explorer II might just do the trick.

One footnote: We could find no indication on the radio or accompanying material of where this radio was manufactured. Best guess: Indonesia or Malaysia.

DAK's DMR-3000 Portable Finally Out

As mentioned recently, we ordered the new DAK DMR-3000 portable some time back. We were told it was in stock and would be shipped immediately, but after a couple of weeks received only a "back ordered" postcard.

The very day we completed this article, the receiver arrived via UPS. We'll start running it through the paces in short order and report on it in a future issue.

MT

Here's what Tom Hart of Dedham, MA, has to say about it.

"In a word: Great! My wife gave me a Model 777 (after some heavy duty hint-dropping). Installation, apart from the usual soldering of antenna leads and sheet metal work on the dashboard, went smoothly.

"Once installed, I was amazed at the quality of the reception—the Philips is roughly comparable to my Sony 2001 as far as sensitivity is concerned. I programmed a flock of my favorite SW, AM and FM frequencies and find the scanner function great. I don't recommend using the keypad for entry while actually driving—could have a bad effect on your safe driving rating for insurance purposes!

"The only thing that I do not like about the Philips 777 is the meager and poorly written owner's manual. Once you get past that, it is smooth sailing. I would not hesitate to recommend the Philips to anyone who would like to commute to the sounds of Radio Australia on 9850, or the BBC on 15220 or Havana on 17705, or..."

"The Cultural Radio Link to Europe"

"For all the talk of satellite radio and TV, shortwave radio remains the most cost-effective electronic mass medium that can span enormous distances instantly and penetrate into every home in Europe."

So says a fact sheet from NEXUS-International Broadcasting Association, the non-profit owner of the Italian Radio Relay Service, IRRS-Shortwave, whose president, Alfredo Cotroneo, recently contacted *Monitoring Times*.

NEXUS-IBA has no political or religious affiliation. It offers state-of-the-art transmission equipment at cost to broadcasters desiring to reach a European audience, and will consider time and program exchange arrangements with other shortwave, mediumwave and FM stations. The non-salaried staff even provides experienced counseling.

The operations of NEXUS-IBA are entirely supported by its members. Increased dependence on listeners' support, similar to Public Radio in the US, may become essential for IRRS-Shortwave to continue and/or expand with more programs and longer transmission schedules.

1993 will require some crucial decisions; at that time IRRS-shortwave will have to be relocated. The current bargain rates and free counseling to small broadcasters may not continue indefinitely, so contact them immediately: NEXUS-International Broadcasting Association, P.O. Box 10980, I-20110 Milano MI, Italy; +39-2-337-29-7788, FAX +39-2-706-38151.

It will be interesting to see what kind of support this effort at Public Radio for Europe receives; we look forward to future updates.

Parting Shots

• Phil Yasson of Vancouver, WA, pulls no punches: "Why doesn't the Justice Department push the ECPA to Eternal Rest and pay scanner operators a small fee to phone tips to the Police Department with information heard on the cellular band? Then we wouldn't have to bite our tongues and make believe we didn't hear what we heard."

• July is a month of patriotic demonstrations and speches in the US and Canada. These days, however, no country seems to be free of cultural clashes. Understandably, no segment of society wants their traditional way of life to be scorned or absorbed into the lowest common denominator. But cultural anarchy is a step backward.

"Think globally; act locally," is the ideal; it could also be the motto of the radio monitor. What better way to bridge the cultural gap than to encourage someone—especially a young person—to get involved in listening to radio? If the individual expresses some interest in amateur radio, the ARRL has an introductory packet tailored to the person's age bracket; just write or call (see page 3).

Summertime is a good time to lay aside DXing and listen to programming for what it can teach us about our neighboring cultures. Lay back, take it easy, and may all your monitoring times be good ones.

Rachel Baughn,
Editor

✔ Check Your Label!

If there is no date next to your name, or if it has expired,

THIS IS A SAMPLE ISSUE OF MONITORING TIMES.

To keep MT coming, use the order form on page 27 and send in your subscription payment today!

John Catalano

CASH — Computer Aided Shortwave Hunting

Okay. Somehow you have squirreled away some valuable time—time much coveted by the wife, kids, girlfriend, parents and the boss. But now it's all yours to sit down and relax with your shortwave listening hobby. So where do you start for best success?! Do you decide by frequency? Or maybe the target station's location? Local time is surely important, but which matters most—your's or the target's?

Are alternative activities starting to look attractive? Don't give up. Instead, use one of the following programs to help decide which of your desired targets you have the best chance of receiving during your precious allotted time.

A major factor impacting all of the questions we asked above is the condition or state of the medium in which radio waves travel. When I was recently lecturing a very bright bunch of physics students on the subject of wave mechanics, I made the casual comment that all electromagnetic waves—from radio waves to light—follow the same laws. Well, the students were shocked to realize that their studies of light and how it travelled were just as applicable to their favorite rock station!

The analogy holds just as good for us radio hobbyists in deciding what is the most likely station(s) to monitor at a given time. The subject of propagation is the interaction of the radio waves with the heterogeneous (or "junked-up") layer of the atmosphere we call the ionosphere. Lots of complex physics, of which we will stay happily ignorant, goes into a propagation prediction. All of the questions of frequency, monitoring station's local time, target station's local time and time of year (surprised?) go into the answer pot.

What is all this for, you ask? Well, think of the light analogy. The transmitting station "shines" its broadcast in all directions. A bit of the "light" travels along the ground a short distance. More of it heads for the sky and that ionosphere layer. This layer is not only miles thick, but is very moody. Sometimes it acts like a high quality mirror and reflects all of the signal (oops, "light") back to the earth. However, sometimes it acts like a piece of glass and lets most of the "light" right through it. Of course, there are all the possibilities in between these extremes, plus, different depths in the layer produce different effects.

Worse still is how this crazy layer will act differently depending on what color light ("frequency") is "shined" upon it. As if that weren't enough, the layer's major influencing force is another precocious and moody body, the Sun.

Right! Time to give up and listen to the local FM station or just play "Wheel of Fortune" with the receiver's dial.

Ham Companion propagation forecast

MUF/FOT/LUF Graph

Time (hrs) YL	TL	UT	< LUF	O FOT	> MUF	1	5	1 0	1 5	2 0	2 5	3 0
19	10	0	12.45	19.73	22.16			<+++++++O+>				
20	11	1	12.21	19.19	21.51			<++++++O++>				
21	12	2	11.83	18.24	20.38			<+++++O+>				
22	13	3	11.26	17.02	18.94			<++++O+>				
23	14	4	10.45	15.30	16.92			<+++O+>				
0	15	5	7.66	13.71	15.73			<++++O+>				
1	16	6	6.51	12.70	14.76			<+++O+>				
2	17	7	5.28	11.82	13.00			<++++O>				
3	18	8	4.04	11.31	13.74			<++++O++>				
4	19	9	2.74	12.31	15.50			<+++++++O++>				
5	20	10	2.20	10.66	13.49			<++++++++O+>				
6	21	11	2.90	11.20	13.97			<++++++O++>				
7	22	12	3.81	12.77	15.75			<+++++++O++>				
8	23	13	4.88	13.92	16.94			<++++++++O++>				
9	0	14	5.97	13.72	16.30			<+++++++O+>				
10	1	15	7.11	12.00	14.97			<+++O++>				
11	2	16	10.06	12.90	13.84			<++O>				
12	3	17	10.86	12.58	13.16			<+O>				
13	4	18	11.45	14.50	15.51			<+++O>				
14	5	19	11.88	16.92	18.60			<++++O+>				
15	6	20	10.88	18.38	20.88			<+++++++O++>				
16	7	21	11.22	19.48	22.23			<++++++++O++>				
17	8	22	11.37	19.63	22.39			<++++++++O+>				
18	9	23	11.33	19.61	22.37			<++++++++O+>				
						2.0	7.3	14.4	21.5	27.1		
						4.0		10.1	18.1	25.0	29.6	

Without a computer, that would be tempting. But with the computing power available to us on our desk, customized propagation predictions can give us a range of the best frequencies to use for a target station during our valuable "stolen time." It's not foolproof, but it's a real good place to start.

Ham Companion Version 2.02 (HC from now on), comes on either three 3-1/2 inch disks or five 5-1/4 disks—not a small program. It requires a PC with 640k ram and two floppy drives of the same type, or a hard drive. I recommend a PC with at least a clock speed of 16 MHz due to the large number of complex, time-consuming calculations which are made for each new prediction. Although HC will work with a CGA monitor, much of the excellent screen detail is lost if you don't use an EGA or VGA monitor.

Installation is very straightforward with a walk-through menu approach. However, before HC will run you must enter your location into the program. This, like all commands, is performed via a command menu which appears along the top of each screen—no fumbling for the manual to remember commands. To realize all the possibilities of HC, however, I recommend a few book sessions. HC comes with a loose-leaf manual which is well written and gives examples of major screens and functions.

Okay, your stolen time is 1:08 P.M. local time on 7/6/92 at your home in Mineola, New York. The kids are at the pool and your wife will be at the mall (try not to think about it) for a few hours. It's YOUR TIME with the radios. Fire up the radios and the computer. Run HC. Let's see, are we in the mood for Japanese shortwave broadcast listening, utility searching from any Gulf military units, or maybe RTTY weather from Bracknell Meteo in England?

One piece of information the program requires at the start is the Solar Flux, which is broadcast by WWV on 2500, 5000, 10000, 15000 and 20000 kHz every hour at eighteen minutes after the hour. The last value entered will be retained by HC and you can start without updating it. But be mindful of the old computer adage, "Garbage in, garbage out" and the moodiness of the ionosphere and the Sun.

The first screen shows your location and a target location. We have three possible listening scenarios in mind, so let's try each one. At the top of the page the command for locations appears with a highlighted "L". Pressing "L" drops down a menu of preprogrammed locations which can be added to by the user. To check on our Asian target we press "6" (Middle East & Asia), and a list of nations, cities and their descriptions appear. Using the arrow keys, scroll down to Japan and the city of Tokyo, number 53, and enter this number. A pop-up window asks what is this location and gives us choices, one of which is our choice: Target Location. After about ten seconds (on a 25 MHz PC) the main menu re-appears with the data.

So, you're trying to hear a station 6,916 miles away! There's lots of other useful info on the screen, but at the bottom, three columns of frequencies tell the story. At the moment, with the given Solar Flux, the frequencies to Japan are probably only good between 15.5 and 11.4 MHz. A quick check of *Monitoring Times'* Shortwave Guide shows Radio Japan on five frequencies, two of which lie in this region; 11815 and 11865 kHz. By pressing "G" a graph shows us how the most probable frequencies from Tokyo to Mineola change during the day. A slightly different form of this information can be printed out for use later. So we could listen to Japan.

What about the Gulf region utility listening? A similar run-though for the target location of Baghdad, Iraq, indicates a good place to start to monitor would be around 20.1 MHz, or anywhere between 7.3 and 24.3 MHz. For Bracknell Meteo, which is near London, England, HC indicates that a good place to start would be at 19.0 MHz. Checking the *Confidential Frequency List*, we find our best bet would be on 18.261.0 MHz for GFE24, Bracknell Meteo.

There you have it. In less than five minutes we have gotten a start on where, out of the entire shortwave spectrum, to start looking for our desired intercepts. Many other features are available in HC including an extensive map-drawing option which allows you to zoom into the region of interest.

Ham Companion is very useful for SWLers, well presented, easy to use and is available from Brinson Microwave Corporation, 507 Asheboro Dr, Katy, TX 77450, Tel. 1-800-874-0771. At $79.95 (plus $5.00 shipping & handling) I find it rather pricey and at the top end for these types of computer assisted shortwave hunting programs.

Another CASH program is **DXAID** version 3.0, which I received from its Canadian author, Peter Oldfield. DXAID gives the listener much of the same information, but offers it in a different presentation. Each piece of data is displayed on a separate screen.

The instructions are on a readme file, so no written instructions are included. The screens are not as well thought out as HC's. The calculated results are similar, although not the same. For example, a difference of a few hundred kilometers was noted on the distance calculations between DXAID and HC. The propagation forecast calculations take about 90 seconds for each hour forecasted, and once it starts calculating, you lose control of your PC until it is done. But, the resulting display gives estimated signal strength at each usable frequency and a bar graph of predicted conditions (Poor to Excellent).

The user is asked to input antenna and terrain data which is used in the calculations. The map section is adequate but is in much coarser detail than HC without any zoom function or city locations.

Modification of the above items in a future version of DXAID would make it more user friendly. But at the price of $25.00 US postpaid, DXAID is worth considering. DXAID is available from Peter Oldfield, 251 Chemin Beaulne, Piedmont, Quebec, J0R 1K0, Canada.

And finally, to round out the CASH column, I'd like to remind you to review last month's column where we looked at a shareware program called **MINIPROP** which is a very, very basic version of the programs we looked at this month.

Propagation programs are just one type of CASH program. As we have seen in previous months, receiver control, logging and terminal control programs are a few others.

Thanks to Jacques d'Avignon for passing along my message of "... always on the lookout for radio related software" which resulted in this month's DXAID discussions. Take Jacques' lead and keep sending me new program details when you find them. Better still, tell the software manufacturers to send the Computers and Radios column a copy of their work for review.

'Til next month, keep those cards coming in for the Message Catcher contest. The questions are easy and you can find them in the May issue of *MT* on page 99. CASH in on the fun and power of combining two hobbies: Computers and Radios!

MT

Doug Demaw, W1FB

How to Maintain Older Radios

If you have trouble resisting a bargain at radio flea markets, chances are that you have purchased shortwave receivers and test equipment that was sorely in need of repair. Minor maintenance can often change a non-working piece of equipment into a unit that performs like new! This month, we will discuss some simple measures that you can apply toward bringing older gear up to standard.

The Visual Check

First, remove the case or cabinet from the equipment to be checked out. The second step is to brush out any dust that may have accumulated on the circuit boards and chassis. Next, while using a magnifying glass you can examine the innards of the unit for darkened resistors (abnormally dark), cracked resistors and poor solder joints. A bad solder connection can often be spotted by observing the color and texture of the solder joint. A poor connection (cold solder joint, as they are called) will often have a dull finish and appear grainy. Good solder joints should be smooth and have a bright finish.

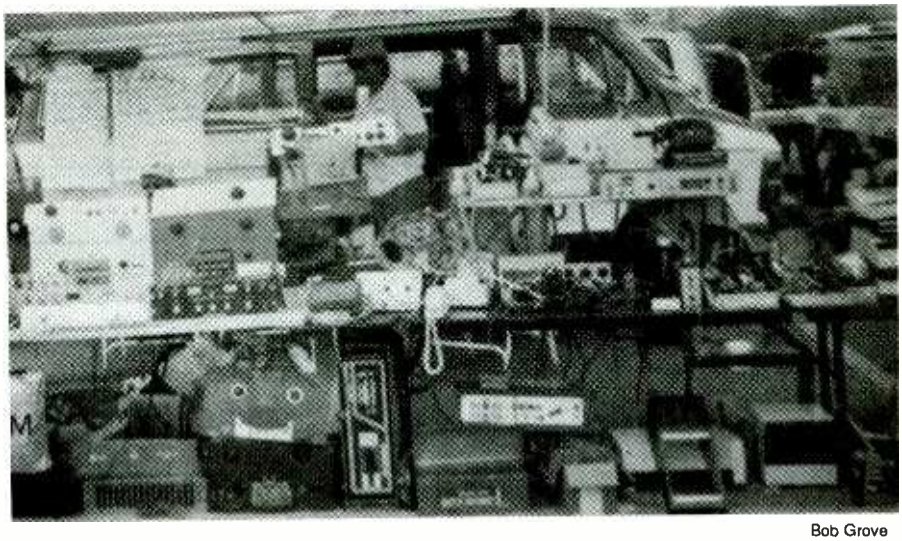
If you locate poor solder joints, reheat them until the solder flows smoothly while using a 30- or 40-watt pencil type of iron. A soldering gun (100 W) will do a better job on old tube types of radios. It is not uncommon to have a cold-solder joint that appears intact, even though the components under it are not joined effectively.

The next part of the procedure is to look for loose screws. This is especially important for PC boards that are bolted to a mainframe. Loose mounting bolts can impair the grounding of these boards. Loose PC boards can cause intermittent operation, self-oscillations or no operation at all. It is a good idea to check the tension on all screws as a matter of preventive maintenance, even though the circuit seems to function okay.

Examine the internal wiring. Look for loose or broken wires. If you suspect that a wire is broken inside the insulation, unsolder one end of the lead and check it with an ohmmeter for continuity. Broken wires are fairly commonplace if the equipment is wired with single-strand hookup wire. Vibration can cause breaks, especially near the connection points for the wires.

Examine also the switch wafers to make certain they aren't cracked or broken. Check to learn whether or not the switch sections rotate together (proper indexing) as the knob on the panel is moved. If the sections fail to track correctly, look for loose allen screws in the shaft couplers.

Finally, examine the circuit-board foils with your magnifying glass to ensure that none of the conductors are cracked (open). If you find a open conductor, merely bridge it with a short length of wire and some solder. Make certain also that there are no solder blobs that are short-circuiting two unrelated PC-board conductors (traces).



Bob Grove

Cleaning the Moving Parts

Switches, tuning capacitors and potentiometers (volume controls, etc.) develop poor electrical joints from air pollution (especially in the homes of smokers). Oxidation occurs and this leads to erratic operation of switches, especially. The carbon elements of volume controls wear thin and become "scratchy" when they are adjusted.

The foregoing components need preventive maintenance on a regular schedule. It is wise to treat these parts at least once a year with a good grade of contact cleaner. Do not use the old-fashioned cleaner that was common in the 30s, 40s and 50s. We used carbon tetrachloride wantonly in those days, prior to learning of its impact on the human liver. The effects are reported to be cumulative, so avoid using that chemical.

Denatured alcohol may be used safely for cleaning controls and switches, but its effects are not lasting. Alcohol is okay for short-term emergency fixes (I once had to use rum to clean the band switch on my HF-band transceiver during a DXpedition on Barbados!).

Commercial contact cleaner is best for cleaning the bearings on variable capacitors, potentiometers and switches. TV tuner spray may be used, but it does not cure the problem for long. I recently learned about a remarkable cleaner spray that not only restores contacts but removes oxidation. It is sold under the name Cramolin. A 6-ounce spray can costs approximately $9, but it is well worth the price. It is distributed by Caig Labs., P.O. Box J, Escondido, CA 92033-3679. The chemical not only removes oxidation, but it cleans and lubricates as well. I have used Cramolin extensively in my radio and RV equipment, and the results are long lasting.

Although radio tubes are not moving parts, the pins of tubes in older radios become oxidized also. A small squirt of spray cleaner in each tube-socket pin is useful toward preventing or curing noisy contacts. Push the tube in and out of the socket two or three times after spraying the socket pins.

Voltage Checking

If your radio is inoperative, it is necessary to learn whether or not the power supply is providing operating voltage. Locate the power supply section and measure the dc voltage at the output of the rectifier tube or diodes. If all is as it should be, conduct voltage tests at each tube or transistor. Operating voltages for tubes in a receiver are typically 200-275 V dc on the plates (anodes). Screen grids should have between 100 and 175 V dc on them. The cathode voltage is dependent upon how much current each tube draws. The higher the current, the greater the

developed cathode voltage. Typical voltages run between 1 and, say, 8 volts dc.

If a voltage is missing, check the associated dropping resistors, IF transformers and such for open conditions. Some resistors increase markedly in value with age. Although they may not be open, they could have excessively high resistance, and this can impair performance.

The operating voltages for transistors (12 volt power supply) are generally between 6 and 12 volts on the collectors for NPN devices. The base will show 1 to 2.5 volts typically. The emitter will have a dc voltage similar to that of the base element.

If you have a unit that uses ICs (integrated circuits), check the VCC pin to ensure that operating voltage is reaching it. This may be a good time to pull the IC from its socket (if a socket is used) and apply a small amount of cleaning spray to the socket pins. ICs do become intermittent at times from oxidation of the pins.

Cleaning the Cabinet and Knobs

If your bargain radio was owned by a smoker, you will find a brown film on the exterior of the equipment. I have had good results when cleaning the cabinets of these radios with *Fantastik* cleaner or a similar detergent, such as *Formula 409*. After you remove the dirt and film, wipe the cabinet with clear, warm water. Dry it well, and apply a coating of household wax, such as *Pledge*.

The knobs may be removed and soaked in warm soapy water for 30 minutes. Upon removing them from the cleaning agent, scrub them lightly with an old toothbrush. This will remove residue from the grooves in the knob. Rinse them in clear water and dry them before placing them on the control shafts.

There will be times when a good scrubbing of the cabinet may remove the white paint from one or more of the panel labels. I use *Liquid Paper* to restore the labels. It can be bought in most office supply stores. Apply it carefully with a fine-tip artist's brush.

Tuneup, if You Dare

I don't recommend that you twiddle the internal adjustments of your radio unless you have a manual that shows what each trimmer does. It is best to do your tweaking in accordance with the manufacturer's alignment procedures. If this data is not available, I suggest that you tune in a weak station, turn up the audio gain and carefully adjust the slugs in the IF transformers for peak signal strength.

Move the slugs slowly left and right to determine where the peak is. If they do not move easily, leave them alone. The powdered-iron slugs in some transformers break easily. You may find that bee's wax or similar has been used to lock the slugs in place. If so, you may heat the tops of the IF cans slightly (only until the wax softens) and proceed with the adjustments.

The oscillator trimmer may be adjusted carefully for the purpose of calibrating the analog dial of the receiver. There will be a trimmer for each band the receiver covers. A 100 kHz crystal calibrator is a useful tool when calibrating the dial. You may also use the various WWV frequencies for markers.

In Summary

I have only skimmed the surface in this general discussion about "help for old radios." What has been presented is often ample for getting an old "jewel" in operating condition. The important consideration is that you should at least try to make a defective unit operational. You may be pleasantly surprised with the results you obtain from following these recommendations.

MT

Bill Cheek

Switches and Switching Techniques—Part 2

Continuing with the topic from last month, we will wrap up switching techniques by looking at a couple of advanced methods to handle your more critical situation requirements. This month, we will look closely at a CMOS Bilateral Switch, which in function, is almost exactly like a 4-segment DIP switch, or better known as a 4PST switch. (4-Pole, Single Throw) A brief study of Figure 1 will tell you almost all you need to know about this type of Complimentary Metal Oxide Semiconductor (CMOS) chip.

The most common of these quad CMOS bilateral switches include the 4066 & 4016 and their faster counterparts, the 74HC4066 and the 74HC4016, all of which are so much alike that they can be interchanged in most instances. The 74HC4066 has the best overall characteristics, but the differences are not too important on the hobbyist's workbench, which means that, in most situations, you can use any of the bunch (see Table 1).

There are a few precautions to be observed with these chips, the first being standard CMOS handling procedures. You must also be aware that the maximum current that can be passed through any one switch section is 25-ma, but to be on the safe side, I'd use 20-ma as a maximum limit. The internal resistance of the switch section added to any series resistance outside the circuit is what determines the actual current flow where current equals voltage divided by resistance.

Let's say that you want to use a 4066 to control a 12-v relay directly, the coil resistance of which is 320-ohms. Using the above table, we see where the 4066 is likely to have a switch resistance of close to 80-ohms in a 12-v circuit, so let's add 80 ohms to the relay's 320 ohms = 400 ohms total series resistance. Now divide 12-v by 400 to equal .030 amps or 30 ma. Oops, we can't use just one section of the 4066 to directly control THAT particular relay, but we can parallel two or even more switch sections to upgrade the current carrying capability.

We can also add a switching transistor driven by the 4066 as shown in Figure 1 to do the job with room to spare! Of course, we could just use a transistor switch from last month's article and dispense with the 4066 chip here. But there might be situations where your switching needs have already called for a CMOS switch. So you could just parallel two switch sections and control pins to safely handle the above relay switching requirement.

Another important precaution with CMOS bilateral switches is that DC voltage anywhere on the chip can be higher than the chip's supply voltage. This is to say that if you use +5 volts at Pin 14 of the chip, then neither the control voltage for a switch section nor the voltage applied to either contact of a switch section can exceed +5v by more than maybe 0.5 volt, max. The solution is to power the chip with the highest DC voltage that is to be found in the circuit which will control the switch section or pass through the switch contacts.

Suppose you want to trigger a 4066 switch with 0 and 8 volt levels: then you must power the chip at Pin 14 with 8 volts, min. While the control or switching voltage of a CMOS bilateral switch cannot be higher than the +DC Volts supply of the chip, it can be less and still work fine. See below.

Another precaution to be observed is the standard CMOS procedure of tying any unused control pins to either ground or +DC power (Pin 14). This keeps the control pins from picking up noise that would inadvertantly trigger the unused switches and thereby make the chip draw more power than necessary. The theory here is a little more involved than I'd like to get into at the moment, so just take my word for it and connect

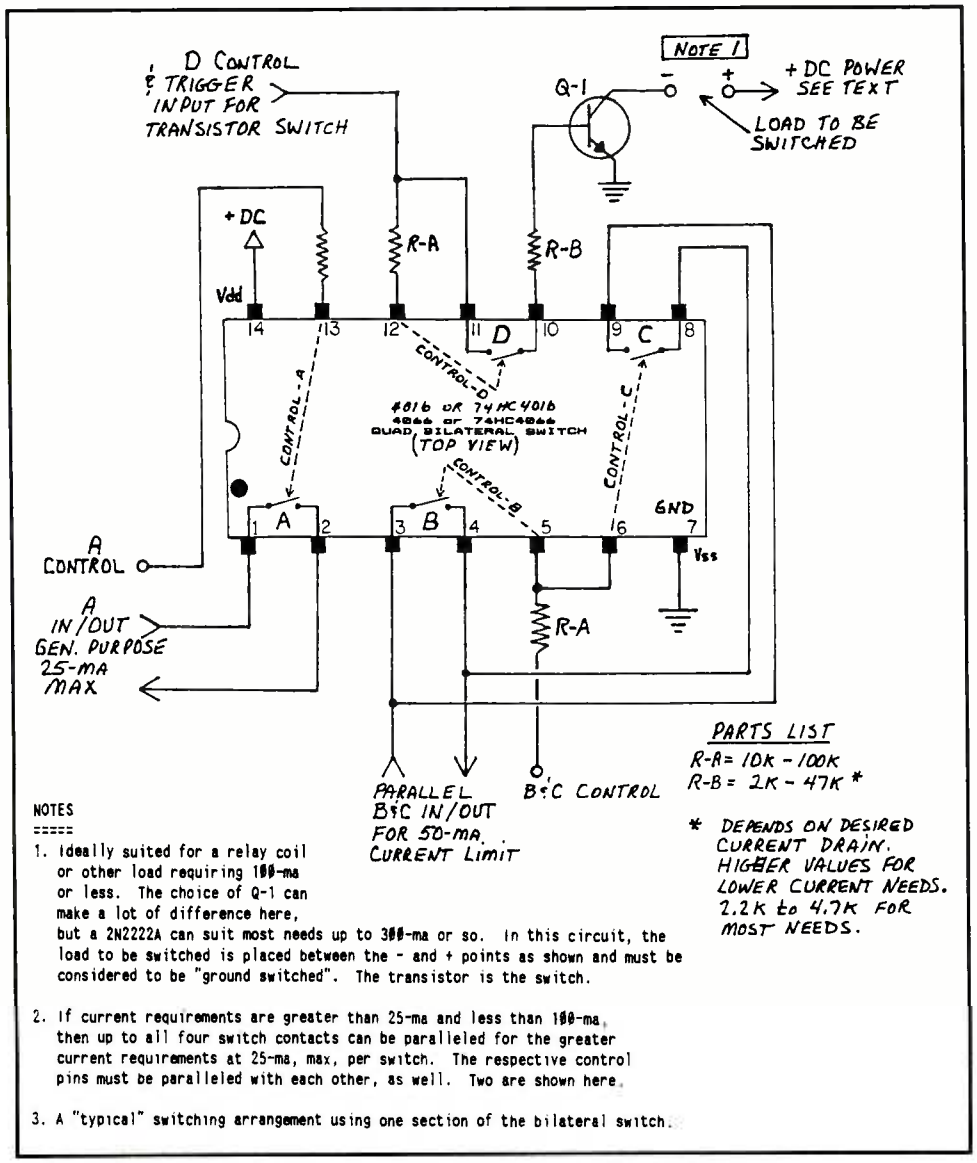


Figure 1: Typical Applications for a Bilateral Switch

any unused control pins to ground at Pin 7 or +DC volts at Pin 14.

How the CMOS Bilateral Switch Works

Never mind the complexity of the insides of a CMOS bilateral switch, they are easy to use and give superior results consistent with the above precautions. First the simple stuff: Pin 7 of the above switch chips is always to be connected to ground. It's the vss or (-) power pin. Pin 14 is the vdd or +DC power pin, and must be supplied with well-filtered DC within the ranges specified in the above tables. The common 4066 chip typically operates at 5v, 8v and sometimes 12v; rarely above or below this range.

Each of these four described switch chips are "quads" with four SPST switches in each package. There is no polarity associated with the actual switch pins; just like any SPST switch, you can input a signal on one pin and take it out on the other; which, doesn't matter. That's how it gets the name "bilateral," meaning both ways. However, the control pin for each switch section DOES MATTER, and is the secret and the beauty to the magic of a CMOS bilateral switch.

The control pin must have on it only one of two possible signals at any given moment: either 0-volts low or +DC volts high. Nothing in between, mind you! But this is logical enough when you understand that a 0-v signal on a control pin turns OFF the associated switch, and a +DC signal turns it ON. It's that simple. Bear in mind what I said above, that the +DC signal on a control pin must not be higher than the +DC Volts supply at Pin 14, but it can be a lot less and still activate the switch.

For example, say you are powering the chip with +8 volts. Most likely, any control voltage above about 2 volts will activate the switch, so that's nice. This does mean, however, that the OFF condition will demand a control signal of pretty close to 0-volts.

Table 1: CMOS Bilateral Switches

Characteristics	4066	74HC4066	4016	74HC4016
DC Supply Voltage	+3 to +18 vdc	+2 to +12 vdc	+3 to +18 vdc	+2 to +12 vdc
Max current per switch	25 ma	25 ma	25 ma	25 ma
Power Dissipation per chip	500 mw	750 mw	500 mw	750 mw
ON Resistance, per switch				
@ 5v	250 ohms	85 ohms	300 ohms	320 ohms
@ 10v	120 ohms	63 ohms	260 ohms	170 ohms
@ 15v	80 ohms	63 ohms	260 ohms	170 ohms
Propagation Delay				
@ 5v	20 ns, typ	10 ns, typ	15 ns, typ	10 ns, typ
Bandwidth	65 MHz	150 MHz	40 MHz	150 MHz

Applications of CMOS Bilateral Switches

I think CMOS bilateral switches were developed largely with digital applications in mind, but they lend themselves to a wide variety of analog switching needs, too. Generically speaking, these switches are eminently suited for multiple switching actions with a single switched input.

Imagine, if you will, turning several different functions on and off with a single flip of an external switch. That will give you a general idea. Another general application is for remote switching needs. Say you need to control several things at a distance from your favorite operating location. Okay, set up a toggle switch panel wherever it is convenient, and run the control wires to the on-site 4066 chip to switch whatever meets your fancy.

This application brings to mind how hobbyists frequently try to use toggle switches for crystal oscillator and IF Filter switching; definitely NOT on the recommended list. See my column in the April '92 issue of *MT* for one way to use a bilateral switch for IF filters.

The CMOS bilateral switch has unlimited uses in the hobby shack; the chips are very inexpensive and once you've experimented a little with them, you'll wonder how you ever managed to do without!

CMOS bilateral switches are routinely used throughout today's shortwave and scanner receivers for a diversity of requirements including mode, selectivity, oscillation, and logic switching. The 4066 is a fundamental component of today's emerging scanner-computer interface technology.

Future Challenges

Please continue to send me your ideas on experimenter's technology for potential treatment in this column. One thing that seems to be in hot demand, but for which I have not found a successful solution, is an SSB adaptor or BFO for scanners.

Before you leap to the workbench, please consider that to be consistent with modern standards, a BFO must be extremely stable, drift free and still be able to "swing" at least +/- 5 kHz up to +/- 7.5 kHz. Ideally, to meet the needs of a majority of scanners, BFOs at 10.7 MHz and 450 kHz are needed.

By the way, 455 kHz BFOs will also be useful for SW receivers that don't have SSB capability. What else would suit your pleasure?

Sources

MT

Suppliers of CMOS bilateral switches:

Digi-Key Corp.
701 Brooks Ave. South
P.O. Box 677
Thief River Falls, MN 56701-0677
800-344-4539

Easy Tech
2917 Bayview Drive
Fremont, CA 94538
800-582-4044

Derf Electronics Corp.
37 Plain Avenue
New Rochelle, NY 10801
800-431-2912

Application of CMOS bilateral switches to scanner/receivers

World Scanner Report
P.O. Box 262478
San Diego, CA 92196-2478

W. Clem Small, KR6A, CET

A High Gain, Highly Directional Antenna for the Shortwave Bands

This month's antenna is a beam with a high degree of directionality. It is particularly effective at giving you the ability to concentrate on signals from one direction while more-or-less ignoring most other signals from other directions.

If you have never used such a beam, its performance will likely give you a pleasant surprise. A group of hams recently used this beam in an amateur-radio special event and received very good signal reports from country after country in the direction of the beam's main beam lobe, while experiencing almost no interference from stations in other areas.

Let's Design One

First, if you have limited space, you must decide whether the antenna will fit your available area. The higher the frequency for which it is designed, the smaller the antenna will be. The 21 MHz model I built is about 21 ft (6.4 m) wide and 80 ft (24.4 m) in length. If you use a free-standing pole or tower at each corner, it would take a rectangle about 21 ft x 80 ft to mount that antenna. But if you use guy ropes to steady the poles, the required space is somewhat more. To determine the space you will need for your antenna, sketch out the antenna on paper using the element length and spacing measurements you get from the formulas given below. Add in any guy wires you will need.

Second, determine the correct direction to point the antenna in order to get it aimed at the DX area with which you want to communicate. Ordinary rectangular maps can badly mislead you about the direction to far away places. A better way is to get a globe of the world and stretch a string between your location and the area with which you want to communicate. The string will show you the angle or "great circle" direction to use for orienting your antenna. There are also several computer programs available which give great circle bearings for antenna orientation.

Once you have the proper direction to point the antenna, get a good handle on where north is. If you use a magnetic compass, be sure to find the local correction necessary for its use. A better way is to go out at night and mark a north-south line by sighting on the North Star. Whatever method you use, it is important to point the antenna correctly.

It is best to erect the antenna a half wavelength or more above ground. The higher the better. A half wavelength is often higher than most of us can manage, so we mount the antenna as high as we can.

N1FPR, WX1O, KA1UMB and I used this beam, cut for 21.3 MHz, for the special event station mentioned earlier. It was mounted only 5-1/2 ft off the ground at the reflector end (about 1/8 wavelength high) and about 10 ft (not quite 1/4 wavelength high) at the end with the last director. As you can see, this was far from ideal height, but the beam worked quite well.

Determining Element Lengths

DRIVEN ELEMENT (in feet) =
426/F; (in meters) F = 130/F
For example, at 10 MHz,
DE=426/10 = 42.6 ft; or 130/10 = 13 m.
REFLECTOR, (in feet) =
445/F; (in meters) F = 136/F.
DIRECTOR, (in feet) =
411/F; (in meters) F = 125/F
SPACING, (in feet) =
295/F; (in meters) F = 90/F.

Let's Build One

1. Determine the element lengths and the spacing by using the formulas just given. Number 14 insulated house-wiring wire was used for my antenna. Bare wire or wire of a larger or smaller size is OK if it will take the stress of installation and weather.

2. Cut the elements to length leaving perhaps 5 in. extra on each end (10 in. per wire). This extra wire is for wrapping through the insulators at each end of the wire. For the driven element leave about 20 in. extra wire to use for attaching its end insulators and center insulator.

3. Cut the driven element at its center and remove the insulation from the wires at this cut for perhaps 6 in. This makes the wire ready for attaching the feedline later. Now insert the center insulator and attach the wires as shown in fig.1.

4. Put one insulator on each end of each element as shown in fig. 1. As you put the insulators on, make sure that each finished

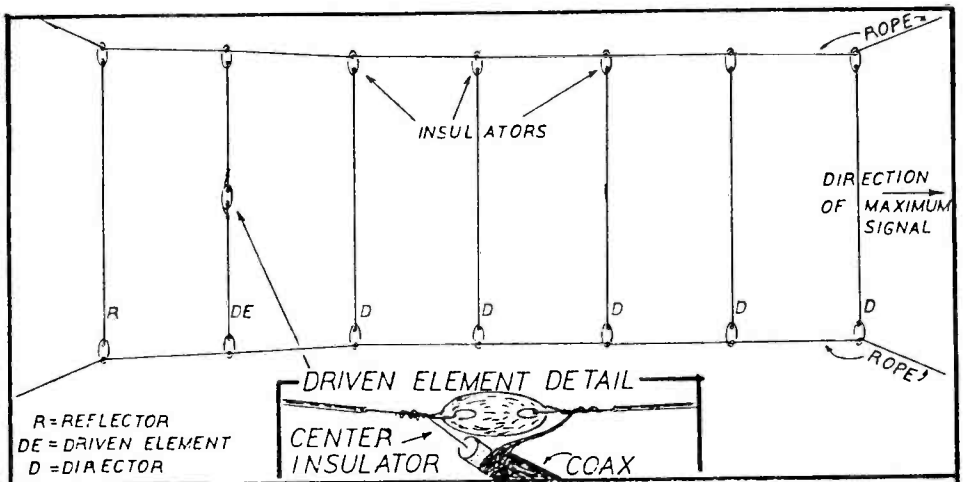


FIG.1. TOP VIEW OF A HIGH-GAIN, HIGHLY-DIRECTIONAL YAGI-UDA BEAM ANTENNA.

element is the correct length. Snip off any excess wire.

5. Lay out the elements on the ground in the approximate position they will occupy in the beam as shown in fig. 1. Thread a small strong rope through the ends of the insulators on each side of the antenna as shown in fig. 1. Set the proper spacing between elements and fix them in place. One way to fix them in place is to put a loop of the small rope through the end-eye of the insulator, then fold the loop back over the same end of the insulator. This allows the fix to be moved easily later if necessary.

5. Although it is not a close match, either 50 or 75-ohm coax should work OK on this antenna. I used 75 ohm line and it worked fine for both transmitting and receiving. At the center connector, one side of the antenna is connected to the coax center conductor and one side to the coax shield. Make these connections good electrically, soldering them if possible. Then seal the coax-cable end with coax-type sealer to keep out the weather.

6. Tie the ends of the side ropes to the masts, trees, or whatever you have chosen to use to hold the antenna up. You may find at this point that the side ropes each need a support at about the middle of their length. Add guy ropes as needed.

7. Don't forget that the minimum lightning-induced damage protection, especially in lightning country, is to never use the antenna during a storm, and disconnect and ground the antenna when it is not in use.

8. Run the coax lead-in to your receiver or transceiver and the antenna is ready to use.

RADIO RIDDLES

Last Month

In last month's column I asked you: "What is a "radioist?" Well, as judged from the fact that you are reading *Monitoring Times*, the chances are very good that you are one! The July 1989 issue of *AntenneX*, an antenna journal which has since ceased publication, reported "radioist" to be a word used to describe those persons interested in such things as amateur radio, SWLing, or CB. Maybe this term should also cover those who love to tinker or experiment with radio equipment or to monitor radio for the fun of it.

Are you "radioist," or do you prefer a different title? Or maybe you can create a new term to fill this niche. Please drop me a line with your suggestion or to vote for the title of your choice. I'll tally the results of all the votes and suggestions and see what we can come up with.

This Month

Why is most coaxial cable which is commonly available for use in radio work either about 50-ohms or about 75-ohms in impedance? Why not 175-ohms or 2000-ohms, 3-ohms or some other value?

You'll find an answer to that, and much more, in your next issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

MT

ask bob

Bob Grove, WA4PYQ

***Q.** Are the new through-the-glass mobile scanner antennas as good as magnet-mount or trunk-lip antennas? (several readers)*

A. No, but they work acceptably well in metropolitan areas where signals are generally strong anyway.

***Q.** The S-meter lamp on my ICOM R71A has burned out. Can I replace it myself? (B.W. Battin, Belen, NM)*

A. You sure can. Call ICOM's service department at 206-454-8155 and order part number 933-02610. Good Luck!

***Q.** I understand that there is an international agency that assigns shortwave broadcast frequencies every few months. How can I get their list? (Dr. Bruce Tracy, Boulder City, NV)*

A. The International Frequency Registration Board (IFRB) is an agency of the International Telecommunications Union (ITU) headquartered in Geneva, Switzerland. They do, indeed, list frequencies used by the international broadcasters (as well as government agencies).

IFRB lists are available on a subscription basis from the United Nations publications office in New York City (212-963-1234); after you dial in, you will need to press 2-4-1-1-2 to get through the electronic mail system to the publications office.

Another excellent source of information is the semi-monthly *World Broadcasting Information* issued by the BBC Monitoring Service at Caversham Park, Reading, England RG4 8TZ.

Finally, the Foreign Broadcast Information Service (FBIS), a branch of the CIA, produces regular mailings on the subject. Their publications are available from the National Technical Information Service (NTIS) by calling 703-487-4780 (FAX 703-321-8547).

***Q.** Has anyone come up with a BFO modification for the Icom R-100 scanner? (George Churpek, Ojai, CA)*

A. Not yet. While such a design would be very straightforward, it would be hard for the tiny front panel to accommodate such a control.

***Q.** I would like to suspend two dipole antennas from the same masts. How far should they be separated? (Jeffrey Zaremba, Averill Park, NY)*

A. Consider two parallel wire antennas as a two-element beam. To avoid significant interaction, they must be separated by at least a half-wavelength if they are nearly the same length. Thus, the longer the antennas, the greater the separation.

Specifically, a half-wave antenna designed for 40 meters (7 MHz range) would need to be separated from the other wire by a distance equal to its length—about 20 meters (67 feet).

But since it is more likely that the antennas are not frequency-related (why would you want two parallel antennas on the same frequency?), they can be spaced much closer. If there is no harmonic relationship between their operating frequencies, they can be separated by no more than one or two feet with little noticeable pattern distortion.

If two antennas are to be mounted at right angles to each other to favor different compass directions, they may actually pass so close as to nearly touch with no appreciable interaction, even if they are of identical length and used on the same frequency.

***Q.** What frequencies are likely to be used in the 450 MHz range by water stream gauge telemetry on the Tuscarawas River in Ohio? (Mark Cox, New Philadelphia, OH)*

A. It is common for hydrotelemetry to use frequencies in the 406-420 MHz federal government band. Others may be heard around 171 MHz and even in the 216 MHz band.

You can be sure by simply approaching the antenna with a handheld frequency counter like the popular OptoElectronic units advertised in *MT*. The transmitters usually stay on continuously, sending their data streams every few seconds.

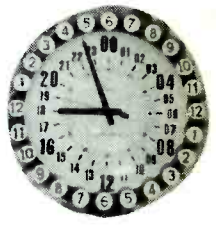
***Q.** How can I eliminate strong-signal overload from a local FM broadcaster? They are about three miles away and blitz my receiver. (Carl Olivetti, Bridgeport, CA)*

A. If you don't want to hear FM at all, FM band reject filters are available from a number of sources including Radio Shack. There are also companies that manufacture frequency-selective filters, but they are expensive, typically $150. One of these companies is the Microwave Filter Corporation, 6347 Kinne St., East Syracuse, NY 13057, 315-437-3953.

An easier way would be to make your own trap like the one shown in the "Hints" section of the June issue of *MT*.

Bob's Tip of the Month

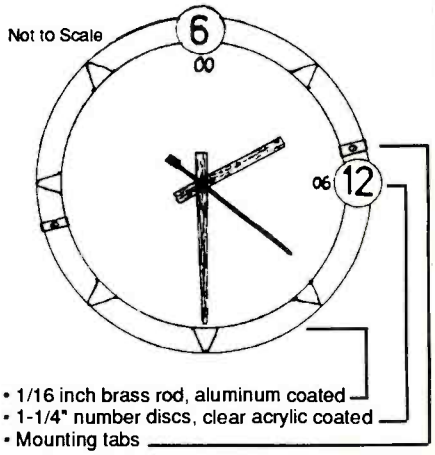
Daylight Savings/ Standard Time Conversion Ring



One resourceful *MT* reader has designed a clever slip-on time conversion ring for the popular Grove CLK-1 24-hour wall clock sold each year in the Grove Christmas catalog.

Hugh Hawkins of Route 1, Box 425-A, Port Gibson, Mississippi 39150, will make one for *MT* readers for $7.50 including shipping. Let him know if you want it in two 12-hour splits or one 24-hour ring.

Home tinkerers may wish to build their own following Hugh's directions.



The outer ring is 13-1/4" in diameter; the inside ring is 12-3/4". Number disks are cut from white poster board and numbers are black applied with a lettering guide. After mounting on the frame with epoxy cement, they are sprayed with clear polyurethane. The finished assembly mounts on the raised rim around the face of the clock with two small self-tapping screws. There are two sets of mounting holes allowing the number ring to rotate when changing from Daylight to Standard Time.

Madness — Continued from page 24

12:30 PM

Pretty well all of Los Angeles was shut down. Most businesses were either closed for the day or planned to close early. Everyone that I called was so spooked, all they wanted to discuss were the riots. This event touched more people than any quake, fire or flood that had occurred since I had been living in LA.

Realizing that I was getting no work done anyway, I headed home. As I drove the deserted freeway, the newsflash on the car radio was Rodney King himself asking the people to put an end to the violence. But it was too late. It was already over.

Epilogue

The burning stopped. The rioting finished. It ended as quickly as it had begun. Fifty-eight people died and 1600 were injured. Four thousand buildings burned. Ten thousand businesses were ruined. Damages totalled 800 million dollars. Riot coverage continued for days, but I couldn't watch it any more.

Throughout the following weekend, I made several hundred contacts on the 15 and 20 meter ham bands. I was moved to hear the concern in the voices of those from around the country that contacted me. The curfew was finally lifted on Monday, following a more or less peaceful weekend. The scanner was still buzzing for days as the cleanup began, and the city tried to get back to normal. I had experienced these events at a distance, but it was 'way too close to suit me.

Computer-Aided Crisis Scanning

By Dan Amaniera

Wednesday, April 29th

At 5:30 PM it seemed like an ordinary day as I began my drive home from work to the San Fernando Valley. Just one minute later I tuned into my car radio and the world turned upside down. I listened in disbelief as it was announced that the police officers seen beating Rodney King on the now famous video tape were completely exonerated on all counts but one! The resulting violence spread like the fires—the Los Angeles riot was on!

My feelings were mixed with sadness, fear, horror and some relief when I learned that the San Fernando Valley and my home were not yet affected by the rage of the riot. As a monitor, the excitement of being able to experience the situation first hand took over as I rushed home to my equipment. I recognized that this was a once in a lifetime opportunity to listen in to agencies and channels rarely if ever heard during normal day to day operations.

I cranked up the PRO-2006 and my laptop controlled R-7000 as soon as I got home. In a short period of time, I realized priorities *had* to be set since the number of busy channels was overwhelming. In search of the hottest action, I set the PRO-2006 to the channel used by the LAPD's elite Metro Division while programming a new bank of anticipated active frequencies on the laptop computer.

I already had a bank containing every Los Angeles City Fire channel on my handheld PRO-34. The PRO-34 was more than adequate to receive the Fire Department's 800 MHz transmissions. I was amazed by the high drama action heard on these channels. Firemen braved rocks, bottles and gunfire in an attempt to carry out their duty. All available resources were committed to riot-related fires as hundreds of buildings burned to the ground. At this point I was listening to three scanners!

Another notable channel was the Inter-Hospital HEAR frequency. Each hour, the Health Department Emergency Operations center would poll local hospitals to determine the number of riot-related dead, critical and non-critical patients. There seemed to be no end in sight as the numbers increased hourly. Citizens were being killed and maimed simply for being at the wrong place at the wrong time.

As it turned out, the Metro Channel was the most productive, but the violence did not stop at the city limits. While listening to the heavy duty action on Metro, I was busy programming every Mutual-Aid, Tactical and Emergency channel I could think of. Los Angeles Sheriff channels were also maxxed-out, so I limited my programming to the channels supporting the emergency command posts which were being set up to quell the violence. I excluded Dispatch channels completely and began programming frequencies used by State and Federal agencies.

The main concern of State and Federal agencies seemed to be protecting their own agents and property. All FBI, DEA, ATF and INS agents in the city were recalled to their respective offices. FEMA could be heard establishing contact with key personnel on VHF. No activity was heard on FEMA's HF primary circuits.

Throughout the riot, all published National Guard frequencies remained quiet. I finally did locate the National Guard on Army VHF Low Tac channels, both WFM and NFM, talking about posture, profile and troop deployments. They appeared on different channels every day and there seemed to be no *assigned* channels. Data was heard being transmitted on several UHF circuits.

The bottom line is simple. There was more action than a one-man listening post could keep up with. Yet, by prioritizing and not trying to "hear it all," I was able to eliminate routine traffic

Continued on page 111

Table 1: Active Riot Frequencies Monitored by Dan Amaniera

Service	Frequency/MHz	Comments
LAPD		
Metro Division	506.8375	Command post
Tac 1	154.830	Air recon, logistics
Tac 2	154.770	Air recon, logistics
South Bureau Tac	507.0375	
Central Bureau Tac	506.5875	
Emergency Trigger	507.0875	Officers in trouble
LASO		
A-Tac 4 South	484.1375	
Mutual Aid East Central	483.7875	
C-Tac 2 Countywide	482.8375	
C-Tac 3 Countywide	483.0625	
Emergency Trigger	483.2875	
Special Unit	483.5375	
LAFD		
Ch 9 Special Dispatch 8	57.2375	Arlington IC
Ch 11 Cmd & Public Info	860.7625	Helicopter Recon
Ch 2 Fire Ground	859.9375	
Ch 3 Fire Ground	858.9375	
Ch 5 Fire Ground	856.9375	
Various Agencies		
Helicopter Unicom	123.025	Air to Air, various fire & law enf & news
Inter Hospital HEAR	155.340	
State Police	460.375	State property
Highway Patrol "Blue"	42.34	Info broadcasts
Fed Protection Svce	417.2	Federal buildings
FEMA	143.0	Alert & callups
State Dept Justice	154.68	
LA County Parks	453.675	Law enforcement
State Fire Mutual Aid	154.28	Responding outside of county strike teams
US Marshal	163.20	LA control
US Marshal	162.7125	
Bureau of Prisons	170.925	
FBI "old A-3"	163.8625	Riot teams flown in from out of state
FBI	167.25	
FBI	164.05	
Federalized National Guard and Marines		
Tactical	30.3 NFM	Golf India Romeo
Tactical	38.3 NFM	Yankee 52
Tactical	40.99 WFM	Papa 34 & 57
Tactical	36.55 NFM	Possible USMC

Dan Amaniera

Club Circuit

Club Profiles

Association of DX Reporters (ADXR)

Founded in 1982, the Association of DX Reporters is primarily an exchange of loggings and relevant information among members via the club publication, *DX Reporter*. The club's goal is to continue building on its strong non-broadcast base to become the utility club.

A sample bulletin is available for $1 (5 IRC's foreign). Yearly membership dues in the U.S. are $19. Write to ADXR, 7008 Plymouth Road, Baltimore, MD 21208.

Michigan Area Radio Enthusiasts (MARE)

MARE is an active club of radio enthusiasts on all bands. Bi-monthly meetings, held at various locations around the state September through May, usually feature a semi-formal presentation. Tours and DXpeditions are frequently scheduled in addition to the meetings.

MARE publishes a bi-monthly bulletin, *Great Lakes Monitor*, containing a calender of activities and meetings, club news, dealer and equipment reviews, technical articles and regular columns on the various bands. Annual membership is $9.50 for the U.S. or Canada. Send $1 for a sample bulletin. Michigan Area Radio Enthusiasts, P.O. Box 311, Wixom, MI 48393-0311.

Club Listings A - M

Don't see your club listed this month or in last month's N - Z listing? Write or call the Brasstown office to request a form for the Club Circuit.

Club Name: All Ohio Scanner Club
Contact: Dave Marshall
Club Address: 50 Villa Road, Springfield, OH 45503-1036
Region: Ohio and surrounding states
Interests: VHF/UHF and some HF and amateur coverage
Publication: American Scannergram

Club Name: American SW Listener's Club
Contact: Stewart MacKenzie, WDX6AA
Club Address: 16182 Ballad Lane, Huntington Beach, CA 92649
Phone: (714) 846-1685
Region: Western US, Pacific, Asia, & Middle East
Interests: SWBC, utilities, longwave
Publication: SWL

Club Name: Association of Clandestine Enthusiasts (A.C.E.)
Contact: Kirk Baxter
Club Address: P.O. Box 11201, Shawnee Mission, KS 66207
Region: US, Europe and Middle East
Interests: Pirate and clandestine
Publication: The A.C.E.

Club Name: Association of DX Reporters (ADXR)
Contact: Reuben Dagold
Club Address: 7008 Plymouth Rd. Baltimore, MD 21208
Region: International
Interests: Utilities, ham band, QSLing, MW, LW, and SWBC
Publication: DX Reporter

Club Name: Association of Manitoba DX'ers (AMANDX)
Contact: Shawn Axelrod
Club Address: 30 Becontree Bay, Winnipeg, Manitoba, R2N 2X9 Canada
Phone: (204) 253-8644
Region: Manitoba
Interests: LW, MW, SW, and VHF/UHF

Club Name: Bay Area Scanner Enthusiasts
Contact: Herman Frisch
Club Address: 4718 Meridian Ave. #265, San Jose, CA 95118
Region: San Francisco Bay area
Interests: 30+ MHz
Publication: Listening Post

Club Name: Bearcat Radio Club
Contact: Larry Miller
Club Address: Box 360, Wagontown, PA 19376
Phone: 1-800-423-1331
Region: US and Canada
Interests: Scanning only
Publication: National Scanning Report

Club Name: Boston Area DXers
Contact: Paul Graveline
Club Address: 9 Stirling Street, Andover, MA 01810
Phone: (508)470-1971
Region: 50 mile radius Boston
Interests: SWBC

Club Name: Canadian Int'l DX Club
Contact: Sheldon Harvey, President
Club Address: 79 Kipps St., Greenfield Pk., Quebec , Canada J4V 3B1
Phone: (514)462-1459
Region: Canada nationwide/membership open to all
Interests: General coverage
Publication: The Messenger

Club Name: Cincinnati Area Monitoring Exchange (MONIX)
Contact: John Vodenik
Phone: (513) 398-5968
Region: SE Indiana, Kentucky, SW Ohio
Interests: SWBC, utility, military, satellites, scanning, BCB

Club Name: Decalco Mania
Contact: Paul Richards
Club Address: P.O. Box 126, Lincroft, NJ 07738
Region: (206) 356-3927 (Phil)
Interests: Collecting radio related items

Club Name: Drake SPR4 Int'l Club
Contact: Rick Sitz
Club Address: 5210 14th St. W. #1, Bradenton, FL 34207
Region: Worldwide
Interests: Drake SPR4 owners

Club Name: DX Audio Service (NRC)
Contact: NRC Publications Center
Club Address: P.O. Box 164, Mannsville, NY 13661-0164
Region: Worldwide
Interests: AM/FM
Publication: DXAS Cassette 90-min monthly Audio magazine.

Club Name: DX Club of India
Contact: Navin Patel
Club Address: 809, M.G. Road, 1-Dutt Niwas, Mulund, Bombay-400 080, India
Region: India
Interests: SW DXing

Club name: European DX Council
Contact: Michael Murray
Club Address: P.O. Box 4, St. Ives, Huntingdon, Cambs PE17 4FE England
Region: Europe

Club Name: Ft. Wayne Radio Listeners Club
Contact: Robert E. Hilton
Club Address: 5809 Heatherview, Fort Wayne, IN 46818
Phone: (219)489-5821
Region: Ft. Wayne area
Interests: All aspects of radio

Club Name: Int'l Radio Club of America (IRCA)
Contact: Ralph Sanserino
Club Address: 9705 Mary NW, Seattle, WA 98117
Region: Worldwide
Interests: BCB/AM DX
Publication: DX Monitor

Club Name: Longwave Club of America
Contact: Bill Oliver
Club Address: 45 Wildflower Rd. Levittown, PA 19057
Phone: (215)945-0543
Region: Worldwide
Interests: Longwave only
Publication: The Lowdown

Club Name: Metro Radio System
Contact: Julian Olansky
Club Address: P.O. Box 26, Newton Highlands, MA 02161
Phone: (617) 969-3000
Region: New England states
Interests: Public Safety
Publication: M.R.S. Newsletter

Club Name: Michigan Area Radio Enthusiasts
Contact: Bob Walker
Club Address: P.O. Box 311, Wixom, MI 48393
Region: Michigan & surrounding
Interests: All bands
Publication: Great Lakes Monitor

Club Name: Monitor Comm. Group
Contact: Louis Campagna, Ops. Mgr.
Club Address: 8001 Castor Avenue, #143, Philadelphia, PA 19152-2701
Region: 35 mile radius of Philadelphia
Interests: Various types of comms.

New Additions

Club Name: NYC Radio Fre(ak)Qs
Contact: Joe Alverson
Club Address: 199 Barnard Ave. Staten Island, NY 10307
Phone: 718-317-5556
Region: NY boros & LI
Interests: VHF/UHF/HF utilities

Club name: Chicago Area DX Club
Contact: Edward G. Stroh
Club Address: 53 Arrowhead Drive, Thornton, IL 60476
Region: 150 mile radius of Chicago
Interests: DXing all bands
Publication: DX Chicago

Club Name: Bayonne Emergency Radio Network (BERN)
Contact: Ray Baron
Club Address: P.O. Box 1203, Bayonne, NJ 07002
Phone: 201-662-2222
Region: NE Jersey
Interests: Public safety

Let's Start a Club

Quad Cities Club: Would like to get in touch with other SWBC, MW and SW utility DXers in the Quad Cities and other nearby areas. Hope to have occasional DX get-togethers or perhaps start a local club. Contact Don Moore, 716 Ripley St., Davenport, IA 52803.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
July 10-11	**Maplewood, MN**	Amateur Fair/Keith Mobarry P.O. Box 26331, St. Paul, MN 55126, (612) 653-9999. Location: Aldrich Arena, 1850 White Bear Ave. Friday: 6 PM to 10 PM and Saturday: 6 AM to 3 PM. Admission: $6
July 11	**Oak Creek, WI**	South Milwaukee ARC Swapfest/Robert Kastelic, WB9TIK P.O. Box 102, South Milwaukee, WI 53172-0102, (414) 764-3235 ext. 58 Location: American Legion Post #434, 9327 S. Shepard Ave. 7 AM to 2 PM, $4 admission, talk-in on 146.580 simplex.
July 11-12	**Indianapolis, IN**	ARRL Central Division Convention/Cornelius Head, WB9FQE 9046 Mercury Dr., Indianapolis, IN 46229.
July 12	**Pittsburgh, PA**	North Hills ARC Hamfest/Don Jackson, N3LAZ 8 Dale Ave., Bradford Woods, PA 15015, (412) 935-3343. Location: Northland Public Library, 300 Cumberland Road. Free admission, 8 AM to 3 PM, talk-in on 147.09.
July 12	**Golden, CO**	Denver Radio Club/CO Assoc. of DXers* Location: Jefferson County Fairgrounds, 8 AM to 3 PM.
July 18	**Eau Claire, WI**	Eau Claire ARC Hamfest/Lis Searing, N9EQR 1129 McKinley Rd., Eau Claire, WI 54701, (715) 834-1303. Location: Chippewa Falls Fairgrounds.
July 18-19	**Atlanta, GA**	Atlantic Radio Club/Vern Fowler, W8BLA Suite E-6, 4343 Shallowford, Marietta, GA 30062.
July 19	**Washington, MO**	Zero Beaters ARC Hamfest/Craig Brune, N0MFD P.O. Box 24, Dutzow, MO 63342, (314) 239-0060 Location: Hillerman Park, 6 AM to 3 PM, free admission. Talk-in on 147.240 & 444.900.
July 25	**Brewster, NY**	PEARLfest '92/Len Sanchez, N2KPM RD #11, Union Rd., Lake Carmel, NY 10512, (914) 225-8229 Location: JFK Elementary School, Foggintown Road, $4 admission. 8 AM to 2 PM, talk-in on 145.130 MHz.
July 31-Aug 2	**Oshkosh, WI**	Experimental Aircraft Assoc Fly-In Convention/Fox Cities ARC Wayne Pennings, WD9FLJ, 913 N. Mason St., Appleton, WI 54914 Location: Lone Rock Service Building at Pioneer Airport, EAA Museum, daylight hours on 10,15,20, & 40 meter bands.
Aug 1-2	**Jacksonville, FL**	Jacksonville Amateur Radio & Computer Show/Greater Jacksonville ARC P.O. Box 11882, Jacksonville, FL 32239. Location: Prime Osborn Convention Center. Friday 1-8PM, Saturday 9AM-5PM, Sunday 9AM-3PM. $5 admission.
Aug 8	**Huntington, WV**	Tri-State ARC Hamfest/Bill, KF8QK, 304-522-1933 Location: Huntington Civic Center, 8:00AM
Aug 9	**Frankfort, KY**	Central Kentucky ARRL Hamfest/Bobby Rolph, KB4QNR 2117 Winterberry Road, Lexington, KY 40504 (606) 278-7570 evenings. Location: Western Hills HS, Exit 53 off I-61. $6 admission.
Aug 9	**Mineral Wells, WV**	Mid-Ohio Valley ARC Hamfest/Ron Ferrell, WD8RGZ, 614-423-5482 Location: 4-H Campgrounds, 2 miles off I-77 on Rt 14, daylight to 3PM. Talk-in on 146.745 and 443.05.
Aug 14-16	**Park City, UT**	WIMU '92/CO Association of DXers*
Aug 15-16	**Albuquerque, NM**	Duke City Hamfest/Jay Miller, WA5WHN PO Box 6552, Albuquerque, NM 87197. Location: National Guard Armory, 600 Wyoming NE, starts 9AM, free admission.
Aug 15-16	**Huntsville, AL**	Alabama State Convention/Don Tunstill, WB4HOK 1215 Dale Dr., Huntsville, AL 35801
Aug 20-23	**Los Angeles, CA**	ARRL National Convention/Sandy Heyn, WA6WZN 962 Cheyenne St., Costa Mesa, CA 92626
Aug 21-24	**Tampere, Finland**	European DX Council Conference Details: Finnish DX Association, PO Box 454, SF-00101 Helsinki, Finland.
Aug 23	**Cincinnati, OH**	Great Cincinnati ARA/John Haungs, WA8STX 10615 Thornview Dr., Cincinnati, OH 45241

**SASE to Colorado Association of DXers, P.O. Box 22202, Denver, CO 80222-0202 for information.*

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

Monitoring Times Special Event Calendar
P.O. Box 98
Brasstown, NC 28902-0098

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STOCK EXCHANGE

Ads for Stock Exchange must be received 45 days prior to the publication date. All ads must be paid in advance to *Monitoring Times*.

Monitoring Times assumes no responsibility for misrepresented merchandise.

NON-COMMERCIAL SUBSCRIBER RATES: $.25 per word - *Subscribers only.* All merchandise must be personal and radio-related.

COMMERCIAL RATES: $1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: $50 per issue. Send camera-ready copy or copy to be typeset. Photo-reduction $5 additional charge. For more information on commercial ads contact Beth Leinbach, 704/389-4007.

SURVEILLANCE, COUNTER SURVEILLANCE EQUIPMENT FOR SALE. WRITE SHERWOOD COMMUNICATIONS, BOX 535-G, SOUTHAMPTON, PA 18966 (215) 357-9065.

SUPER 800 MHz SCANNER DUCKIE ANTENNA $19.95 (incl s&h), RG-6 QUAD-SHIELD COAX $.28/ft + $4 s&h (incl. F-conn inst) YAGI-UDA SUPER GAIN ANTENNAS FOR 400, 800, AND 900 MHz. MOBILE DIAGNOSTICS, P.O. Box 1226, Brick, NJ 08724-2925.

SW RECEIVERS, TRANSCEIVERS, ACCESSORIES. SEND SASE FOR LIST: RATEK, BOX 2098, DANBURY, CT 06813 (203) 792-6541.

PROPAGANDA BROADCASTS: Authentic recordings of famous broadcasts—Tokyo Rose, Axis Sally, Lord Haw-Haw, others. One hour cassette $11.95. Detailed info, $1. D-W Research, P.O. Box 37324, Milwaukee, WI 53237.

TONE-CALL TONE ALERTING SYSTEM for CB, Ham, Scanners. Radio stays silent until called. No modifications, inexpensive! Write: Rob Bellville, Box 892MT, Northboro, MA 01532.

NEW ICOMS: R1 $459; R7100 $1139; H16 $515; U16 $525; A21 $479; M7 $295; 100 feet RG8 with solder PL-259s $79; MC/VISA/AMEX; XPM Inc. Communications (512) 693-4999.

GLOBAL DX NEWSLETTER Your monitoring connection for shortwave and scanner bands. Annually $13.95, sample $1 Global-DX, Box 1176, Pinson, AL 35126.

ACE/AOR AR2500. 1-1500 MHz. Mint. $300. (514) 739-9328.

WANTED: DIGITAL PORTABLE SW RADIO, write: P.O. Box 22202, Denver, CO 80222.

UNIDEN PROFESSIONAL SCANNER MR8100, 100 ch, VHF/UHF/full 800 MHz. $225 (907) 248-4456.

FOR SALE: SYNCHRONOUS DETECTOR for 455 kHz IF receivers. Dramatically improves AM: reduces fading distortion, selectable sideband cuts interference. Kit: $139; built/tested: $199; info $3. Steve Johnson, PO Box 3420, York, PA 17402-0420.

Sell ICOM ICR7000 RECEIVER with EEB filter mods. Asking $800. Also UNIVERSAL M7000 for $749. Call anytime, Matt, KP4GO in San Antonio, (512) 680-5450.

R-390A Complete units in various stages of tune, partial units, modules, cases. Repair and restoration available. LSASE for list. AFS, 107 Fayton Ave., Norfolk, VA 23505.

REALISTIC PRO-34 scanner with cellular, nicads, charger and manual. $200, Chuck (603) 929-4339, evenings.

Madness — Continued from page 107

and concentrate on emergency communications. I stayed 15 minutes ahead of all TV news coverage and, in many cases, I heard a lot that didn't even make the news.

I will never forget the Los Angeles riot. The destruction of life and property was overwhelming. Yet I learned that a well programmed portable scanner could save my life one day. After this experience, I know I will be even more prepared for the next crisis and so should you!

Monitoring the LA Bonfire from a Distance

By Todd Dokey

I live in Northern California, so as the night of the Los Angeles Bonfire and Looters Parade wound on, the local news stations began to simulcast from their "sister stations" in Los Angeles.

As I saw fire after fire, I remembered a lesson learned from *Operation Desert Storm* TV monitoring. The "live" aspect of the broadcast would soon dwindle into a long line of analysts and social commentary. So although it was late, about 23:30 local time, I jumped out of bed and headed to the living room to load a junk tape into the VCR.

The fog began to lift in my head, as my body realized that there was no longer any reason to try to sleep. As the fires and violence escalated, I was thankful that I have a fairly good computer database of frequencies. I am too far away from Los Angeles to hear anything directly, so Los Angeles county and city frequencies were of no use. I concentrated on Mutual Aid and the Office of Emergency Services, as well as airport frequencies from all around.

OES maintains a network in the shortwave bands, but I did not have time to monitor them for traffic. The air frequencies also had to go for the most part, to make room for others. I finally fell asleep, after realizing I no longer remembered how many new fires I had seen, nor could I keep track of everything that was going on.

It was not long before the events in Los Angeles became permission and excuse for others to act in like fashion. By the time the rest of the world woke up, it had moved to other cities, including San Francisco. I am close enough to hear most of the repeater traffic.

San Francisco's news media provided the best coverage by listening to the frequencies used to communicate with reporters and helicopters. These were the people capable of quickly getting into the areas and communicating events.

Listening to this traffic put me ahead of the story. In this case, it told me when to turn on the TV to catch the live coverage. By Thursday, the live coverage was already scarce, save on CNN. By monitoring the chatter, I was able to know when a "break-in" was about to occur into a normal programming schedule.

Near where I live, it remained fairly calm except for increased tension and criminal activity, with more rumor than actual event. But, even if you're outside the action, a crisis of this magnitude will usually engage safety and government agencies over a wide area. It never hurts to be prepared.

MT

Table 2 (all freqs MHz)

News media repeater		OES	USB
450.337.50	450.287.50	154.160	7,480
450.364.50	450.050.00	154.220	7,802
450.037.50	450.187.50	154.280	5,140
430.412.50	450.925.00	154.265	2,419
450.437.50	450.312.50	154.295	2,422
450.487.50	450.112.50	484.237.50	2,812
450.512.50	450.587.50		2,804
450.462.50	450.450.00		2,326
			5,195
			7,805

State Police:
460.375
460.450
453.825

Closing Comments

So Long, Heathkit...
...The End of an Era

It was over half a century ago that Howard Anthony, an investor, purchased for a few hundred dollars the assets of a small company whose founder, Ed Heath, had been killed in one of his own kit aircraft. Anthony began manufacturing two-way radios and even some aircraft parts for the military.

After World War II, Anthony borrowed some money and, on a gamble, bought three boxcar loads of surplus electronics—sight unseen. Inside one of the crates were 1000 oscilloscope tubes worth about $50 apiece; at 50 cents each, his gamble paid off!

The budding entrepreneur collected and packaged all the parts necessary to build a complete oscilloscope, including a diagram, and, in 1947, offered the first Heathkit—a do-it-yourself oscilloscope for $39!

The immediate success of the venture inspired more products. The manual became increasingly professional, including assembly instructions and even the basic electronic theory behind each device it accompanied.

By the 1970s, hundreds of kits adorned the pages of the expansive Heathkit catalog; annual sales topped out at $60 million. Customer service was of the highest quality; a consultation telephone line was available to assure the customers' success.

My favorite Heathkit was a DX-100 transmitter. I still feel the reverence and awe I experienced as I carefully unwrapped the individually-packaged, shiny, clean parts and glimpsed inside the tube boxes.

I still smell the rosin smoke curling up from the tip of my soldering iron. I still see the tubes' warm glow, reassuring me I had done the job right.

But the market changed. Hand-wired vacuum tube circuits gave way to integrated and printed circuits which required minimal assembly. Factory-wired Japanese products became available at the same—or even less—cost than the unassembled kits.

The Heath Company has announced that it has discontinued its kits, concentrating instead on higher profit consumer products, and closing an era.

So long, Heathkit, and thank you for decades of unexcelled service, experience and education. Thousands of today's engineers cut their teeth on your products. We will miss you.

Bob Grove
Publisher

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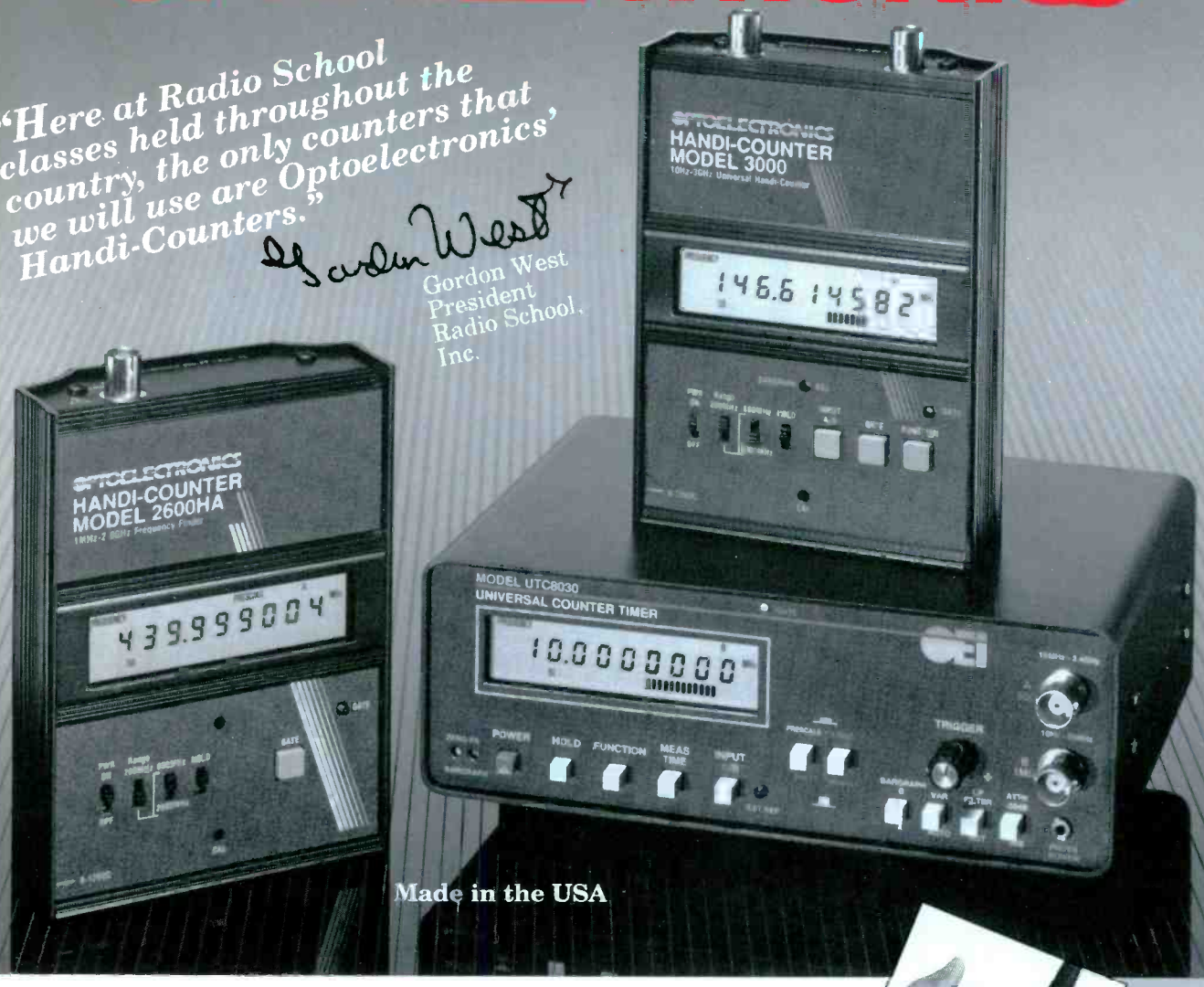
Gordon West
President
Radio School, Inc.



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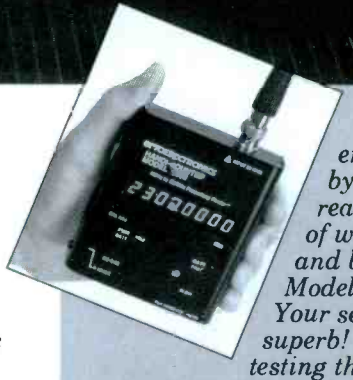
Gordon West



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Display	10 Digit LCD w/Function Annunciators	10 Digit LCD w/Function Annunciators	10 Digit LCD	10 Digit LCD	10 Digit LCD	8 Digit LED	8 Digit LED
RF Signal Strength Indicator	16 Segment Adjustable Bargraph	16 Segment Adjustable Bargraph	16 Segment Adjustable Bargraph	•	•	•	•
Hold Switch	Yes	Yes	Yes	Yes	Yes	No	Yes
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