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Monitoring Times

A Publication of Grove Enterprises, Inc.

It's Time! MT Convention
PAGE 63

CRIME AND SCANDAL
Don't Tune Out Those "Sleepy" Suburbs

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October 1993

Monitoring Times

WEWN: Reaching the People

By John D. Stephens

The newest and biggest shortwave broadcaster on the block is WEWN, the Catholic radio service of the Eternal Word Network. Original plans called for a station near Rome, Italy, but here it is, almost a year old, just outside Birmingham, Alabama. Sporting the latest in high-tech equipment, this station is somehow not what one would expect to emerge from the vision of a cloistered Franciscan nun!

Don't Tune Out Those Sleepy Suburbs

By Dixie Daniels

"Nothing ever happens" in those sleepy little towns outside a metropolis like Kansas City, right? There's really no point in even programming their frequencies into the scanner... That's what Dixie Daniels thought, too, but a year of monitoring has taught her that the action isn't always where you think it is. If you have any doubts about it, read this article!

Oceans of Fun; HF Maritime Monitoring

By Raymond B. Troth

Tugs, towboats, ocean liners, boats servicing oil rigs, tankers, Coast Guard cutters ... there is a world of commerce, recreation and regulatory agencies conducting daily business on the maritime bands. Some of these communications are in the shortwave spectrum, which puts them within the grasp of monitors far inland. Here are some hints on getting started in this enjoyable hobby.

COVER: *Looming above the Fargo, North Dakota, plains is what is likely the tallest man-made structure in the western hemisphere—the KTHI TV tower. See page 6 for more pictures of KTHI by Dr. Adrian Peterson.*

Australian Army Radio 20

By Dr. Adrian Peterson

The U.S. had Armed Forces Radio, England had the British Armed Forces Broadcasting Service, and Australia has also periodically activated a variety of broadcasting outlets to their armed forces stationed away from home. Currently being heard by many monitors around the world are Australia's broadcasts to forces stationed in Somalia and Cambodia.

A Look Into the Navy's Crystal Box 24

By Jack Sullivan

Sometimes even a seasoned scanner buff can be surprised by an unusual find at a hamfest. The "Top Secret" box of crystals Jack discovered may have unearthed some real treasures—only monitoring will tell!

And Much More ... !

This month, you can get a leg up on scanning the Canadian Mounties in "The Scanning Report," or you can tune in to the Secret Service and the many other agencies under the umbrella of the U.S. Dept. of the Treasury ("Federal File").

If that's not your listening pleasure, try an entirely different cup of tea in WLIR in Spring Valley, New York--"all-Jewish, all the time!" This ethnic radio station is reclaiming WLIR's dilapidated studios and making the community sit up and take notice. Karl Zuk reports on WLIR in "American Bandscan."

Has your dream scanner not been invented yet? Take a look at "Scanner Equipment" before you come to that conclusion; your dream machine might just turn out to be the Yupiteru 7100, described in a guest review by j•Com founder Peter Jennings.

DEPARTMENTS

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LETTERS

A Moving Experience

As Bob Grove notes in his Closing Comments, we have been in our new quarters since August 23rd, and we are just about settled in! It is such a delight to have the Brasstown staff all in one spacious, well-lit building built to accommodate our differing needs.

We hope to have a video-tape of our old quarters and our new home available for viewing in the lobby at the Monitoring Times Convention in Atlanta. We hope you can join us there. Although convention registration has been raised to help us meet our expenses, last year's attendees agreed it was worth much more!

Grove Enterprises has moved! (But not here...This is an unidentified location sent in by Wells Perkins of Scotch Plains, NJ, as a teaser!

Compliments of Our Readers

• The August "Beginner's Corner" focussed on ways in which to use the public library to help your monitoring. John Gordon Burke of Evanston, IL, wrote Skip Arey to remind him that *Monitoring Times* has been indexed for the past three years in *Access: The Supplementary Index to Periodicals*. When a slot came available, John says they chose *Monitoring Times* because, "We thought it the best of the periodicals in the field to index."

Articles are listed by author and by subject (such as receivers, receiver mods, international broadcasting, etc.) on a quarterly basis. If your local library doesn't carry the index, which supplements the *Readers' Guide*, tell them to write Access, P.O. Box 830430, Birmingham, AL 35283-0430; 800-633-4931 or Fax 205-995-1588.

• "I want to tell you how much I enjoyed the August article by Don Moore about the sad end of the 'Prague Spring.' It was well-written, factually accurate (according to my modest knowledge), and it brought to mind strong memories from that time." These are the comments of Martin Potter of Greely, Ontario, who goes on to recall his own monitoring at the time.

"During the Spring and Summer of 1968, I had been corresponding regularly with Peter Skala of Radio Prague's propagation department, sending him technical reports of reception conditions. I wonder what became of him. Although I have no record of listening to Prague the morning of August 20, it is quite likely that I did."

"We are all older and wiser now, and the world has definitely changed since then, although we are still troubled by uncompromising ideology, ethnic prejudice and blind vengeance. History has a way of repeating itself and it is wise to remember old lessons. My heartfelt thanks to author Moore for his fine article recalling those unexpected and sad events of the Summer and Fall of 1968."

• Leslie Edwards was touched by the acknowledgement of Kannon Shanmugam's contributions to *MT* in the last edition of "Letters." She says, "I have been in correspondence with Kannon since early 1989. (I didn't know he was 17 at the time—I'm of 'grandmother' age, myself.) I have always received a sincere expression of appreciation and a kind invitation to keep writing. That's *Monitoring Times*—high caliber in every way. It's always a grand day when *MT* arrives."

Port Authority Speeds Up Trunking

Alan Reiss of New York City phoned with some more recent information regarding the New York Port Authority to add to the expansive profile in September's feature section. Although the frequencies were correct for the World Trade Center, Alan says usage is as follows:

Chan X	Security and operations
Chan Y	Maintenance
Chan Z	Otis elevator; Observation deck personnel

The Port Authority was allowed to use two channels on a shared, temporary basis following the crisis: 453.65 KPD644 and 457.875 KGJ547. Alan did not say if these frequencies are still being used.

The article said that the Port Authority had decided not to move to 800 MHz because of the cost of such an enormous change-over. However, in light of the amount of damage caused by the explosion, Alan reports that the decision

has changed: 800 MHz trunked frequencies are already being utilized, and eventually, all services except for maintenance will be moving to the 800 MHz system. An antenna is already in place on World Trade Center #2. Except for the radiax, the system is being paid for by money confiscated from drug busts. Listen for currently active callsign WNNM887 on these frequencies: 866.2125, 866.8125, 867.375, 867.7625, 867.875, 868.55, 868.9125.

Also newly installed is a cellular phone system. Every floor now has one staff member in position who has undergone training in evacuation procedures, and who is equipped with a cellular phone to contact a 911 center. Thanks for the information, Alan; I hope my notes were accurate!

Monitoring Post Pin Up

Eric M. Walton of Vancouver, Canada, reports, "I thought you might be interested in a photo of my listeneing post, as I recently acquired a Radio Shack PRO-2006. As I am located 100 ft. about ground and antennas are on the balcony, the reception is great! I have several QSLs from Papua New Guinea and 10kW ABC Perth, etc. This hobby of 'Listening in to the World' is a very rewarding hobby indeed!"

Betrayed By Your Radio

In August, a reader mused about the technology used by the United Kingdom to detect the use of unlicensed TV and radio sets. One response was from Derick Ovenall of Wilmington, Delaware, who provided this fascinating history:

"In the 1930s and even later, many radio listeners in the U.K. were still using simple two tube radios comprising a regenerative leaky grid detector followed by a single audio output stage. An incorrectly operated regenerative set could easily be picked up and tracked down, but regenerative sets correctly adjusted did not radiate, and I know of no way they could have been picked up by a Post Office Detector Van.

"The regenerative sets were gradually replaced by superheterodyne receivers in which the incoming signal was converted to a fixed intermediate frequency (usually 455 kHz) by a local oscillator operating at the sum of the IF and the frequency of the station desired. Most of these sets did not use an RF stage to isolate the frequency converter from the antenna, and when in use they would radiate weakly at the local oscillator frequency.

"It seems quite possible that the detector vans used sensitive receivers tuned to the local oscillator frequencies corresponding to the frequencies of local radio stations which were relatively few in number. Whenever the locations and times in which a detector van would be operating were published in the local newspapers, the number of new licenses taken out would greatly increase!

"During World War II, fears that local oscillator radiation from receivers on board ships would be used by the enemy to pinpoint location of convoys, led to the development by the E.H. Scott company of a series of very careful shielded receivers which achieved extremely low levels of local oscillator radiation. An excellent account of this is given in an article by John T. Meredith, in the *Old Timer's Bulletin*, vol. 33 no. 4, published by the Antique Wireless Association (Box E, Breesport, NY 14816). I have also read that the German Navy developed multistage tuned radiofrequency receivers to avoid the possibility of local oscillator radiation.

"In his book, *Spycatcher*, (Viking, New York, 1987)—which is purportedly an account of the author's life in MI5, the British intelligence service—Peter Wright claims to have invented a technique for determining the frequencies to which radio receivers in foreign embassies were tuned, by picking up radiation from their local oscillators. Once the local oscillator frequencies were known, incoming transmissions could be monitored.

"Detection of unlicensed TV sets was achieved rather differently. To get adequate reception in the U.K., at least in the 50s and 60s, an outside antenna was usually necessary, and the presence of one of these H-shaped devices on a rooftop could hardly be missed!

"Electronic detection was based on picking up a harmonic from the sawtooth waveform used to build up the picture (in post world war UK, about 10 kHz). Since such sawtooth waveforms are very rich in harmonics, the detector vans used a directional loop antenna and a receiver tuned to one of the higher harmonics of the line timebase frequency to pick up the stray magnetic field emitted.

"Countries which have extremely efficient bureaucracies probably have no need to use detector vans. When I lived in Switzerland in 1961, I learned that all buyers of radio or TV sets had to supply their names and addresses to the dealer, who passed these on to the department in charge of issuing radio and TV licenses!"

Thanks for the comprehensive and fascinating look at something few Americans know much about, Derick. I received a phone call from one reader who does have reason to know about radio emissions, due to the type of work he does with NASA on the Space Shuttle. Art Ruebens' brief explanation seems to bear out your theory.

Art also went into a little history, saying that in older radios, including military radios from World War II, the signal from the local oscillator leaked RF on its way to the 1st mixer. Although ships in a convoy were careful about maintaining radio silence, they would maintain a watch for Mayday calls on 500 kHz. German subs knew about the RF leak, and would be able to pinpoint the location of ships even when they were not transmitting. Art maintains that many Allied ships were sunk that way.

This type of radiation carries perhaps a maximum of ten miles. A car driving 5 mph down the road can tell what radio or TV station you're listening to if you use an antenna. Art thought this is probably not true if the signal is brought in by cable, since the signal does not have to be converted in frequency.

Art further said that all modern military gear and the more sophisticated consumer radios now have several restrictive filters to isolate the local oscillator, so that the LO and the 1st mixer are separated by at least 80 dB.

We appreciate your excellent input, gentlemen, and our thanks to Derick for some hints to our readers for additional sources.

CB Skip

When you make that once-in-a-lifetime catch, you never forget it. John Ward of Tampa, Florida, recalls listening to his CB in 1973 and hearing a motorist calling REACT (Radio Emergency Associated Citizens Teams) to report an accident on the freeway near the airport.

"A tractor trailer had overturned onto several cars and there were multiple injuries. At the time of the call, I was less than two miles from the scene, already on the same freeway. Because I carried a complete trauma kit in my car, I accelerated to about 80 mph and started working my way through traffic. I knew I'd be on the scene five to 10 minutes before other help arrived.

"Then I heard the REACT monitor call back to the mobile and ask him to repeat the accident location. The fellow in the car replied that it was on the *SAN DIEGO* freeway, near the airport!

"Although I had received skip before, the signals were usually weak and noisy and from

Continued on p. 111

Scanners/Shortwave/GMRS/Ham

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26.000 - 28.995 MHz. (AM)	5.0 KHz.
29.000 - 53.995 MHz. (NFM)	5.0 KHz.
54.000 - 71.995 MHz. (WFM)	50.0 KHz
72.000 - 75.995 MHz. (NFM)	5.0 KHz.
76.000 - 107.995 MHz. (WFM)	50.0 KHz
108.000 - 136.995 MHz. (AM)	12.5 KHz
137.000 - 173.995 MHz. (NFM)	5.0 KHz.
174.000 - 215.995 MHz. (WFM)	50.0 KHz
216.000 - 224.995 MHz. (NFM)	5.0 KHz.
225.000 - 399.995 MHz (AM)	12.5 KHz
400.000 - 511.995 MHz. (NFM)	12.5 KHz
512.000 - 549.995 MHz. (WFM)	50.0 KHz
760.000 - 823.995 MHz (NFM)	12.5 KHz
849.0125 - 868.995 MHz (NFM)	12.5 KHz
894.0125 - 1,300.000 MHz. (NFM)	12.5 KHz

Signal intelligence experts, public safety agencies and people with inquiring minds that want to know, have asked us for a world class *handheld* scanner that can intercept just about any radio transmission. The new Bearcat 2500XLT has what you want. You can program frequencies such as police, fire, emergency, race cars, marine, military aircraft, weather, and other broadcasts into 20 banks of 20 channels each. The new rotary tuner feature enables rapid and easy selection of channels and frequencies. With the AUTO STORE feature, you can automatically program any channel. You can also scan all 400 channels at 100 channels-per-second speed because the Bearcat 2500XLT has TURBO SCAN built-in. To make this scanner even better, the BC2500XLT has AUTO SORT – an automatic frequency sorting feature for faster scanning within each bank. Order your scanner from CEI.

For more information on Bearcat radio scanners or to join the Bearcat Radio Club, call Mr. Scanner at 1-800-423-1331. To order any Bearcat radio product from Communications Electronics Inc. call 1-800-USA-SCAN.

Great Deals on Bearcat Scanners

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NEW! Bearcat 2500XLT-F handheld	$344.95
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New FCC Rules Mean Last Buying Opportunity for Radio Scanners

On April 19, 1993, the FCC amended Parts 2 and 15 of its rules to prohibit the manufacture and importation of scanning radios capable of intercepting the 800 MHz. cellular telephone service. Supplies of full coverage 800 MHz. scanners are in *very* short supply. When this inventory is exhausted, there will be no more full coverage scanners available to our U.S. customers. If you have an inquiring mind that wants to know, today could be your last opportunity to own a Bearcat 800XLT scanner. Call Communications Electronics now to order your scanner.

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40 Channels • 12 bands • 2 banks • Priority
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Bands: 29-54, 118-174, 406-512, 806-912 MHz.
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500 Channels • 20 banks • Alphanumeric display
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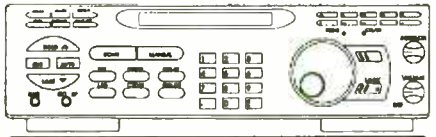

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Sangean ATS808-F portable	$159.95
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Sangean ANT60-F portable shortwave antenna	$9.95

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PWB-F Passport to Worldband Radio by IBS	$12.95
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It's easy to order from CEI. **Mail orders to:** Communications Electronics Inc., Emergency Operations Center, P.O. Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add $15.00 per radio for U.P.S. ground shipping and handling in the continental U.S.A unless otherwise stated. Add $6.00 shipping for all accessories and publications. Add $6.00 shipping per antenna. For Canada, Puerto Rico, Hawaii, Alaska, P.O. Box, or APO/FPO delivery, shipping charges are two times continental U.S. rates. Michigan residents add state sales tax. No COD's. 10% surcharge for net 10 billing to qualified accounts. All sales are subject to availability, acceptance and verification. Prices, terms and specifications are subject to change without notice. We welcome your Discover, Visa, American Express or MasterCard. Order toll-free by calling 1-800-USA-SCAN. For information or if outside the U.S.A. call 313-996-8888. FAX anytime, dial 313-663-8888. Order your electronic equipment from Communications Electronics Inc. today.

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For information call 313-996-8888 or FAX 313-663-8888

Stream of Garbled Distortion

Everyone remembers the tempest that was launched when someone discovered that 800 MHz cellular car phones could be monitored on a scanner. The resulting brouhaha swept the national media for over a year and probably, in the end, accounted for the record number of scanners that were sold last year.

Now comes a series of ads from Motorola that tout the firm's cordless phones. The ads are titled, "You don't let strangers read your mail. Why let them hear your calls?" and feature golfer Lee Trevino.

Says the ad, "All it takes for a stranger to eavesdrop on your cordless call is another cordless phone. Or a police scanner. Or even a simple baby monitor." With Secure Clear technology, the ad promises, "all an eavesdropper hears is a stream of garbled distortion."

No word on the price of these phones.

Serbs Pay Up for Satellite TV

As if things weren't bad enough in the former Yugoslavia, Serbs have found that they must now pay for the right to watch television. As of the first of this month, a license fee for television will be added to Serbian electric bills. The fee is "equivalent to the cost of 100 kW of peak hour electricity..." Everyone pays, TV or not.

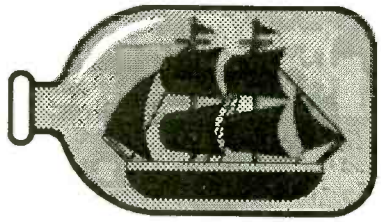
The new revenue will reportedly help to finance a new Serbian satellite TV program "linking up the Serbian nation and... disseminate[ing] the truth about it."

Yugoslavian Semi-Pirate

A station of youthful broadcasters, operating on a 15-day permit that was issued in back in 1989, are presenting their own view of the events in Yugoslavia. With satire, creativity and humor, station B-92 (the emergency call numbers of the Belgrade police), is helping expose official "nonsense" and mobilize opposition to the madness.

In one of their symbolic "happenings," B-92 staged an "All the President's Babies" event to protest taxes on infant clothing and supplies being raised to 44 percent. They gathered 300 infants in front of the President's office and "gave" them to him, since the parents could no longer afford to keep the children. When all the parents withdrew, 300 infants of course began to cry. The taxes went down.

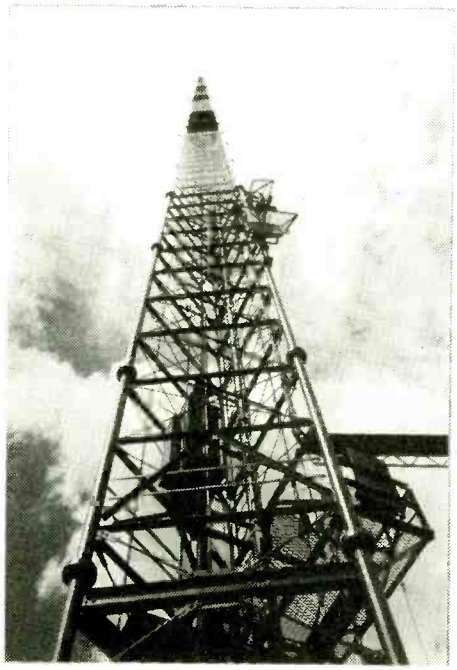
B-92 rebroadcasts BBC news twice a day as well as their own independent news reporting and western rock music. It has little funding and its low-power FM transmission barely covers the city of Belgrade, but somehow, its "truth" is being heard without a satellite.



Pirate Ship to be "Blown Away"

The infamous *M/V Sarah*, former home of Radio NewYork International, has been purchased by MGM Pictures to be used in the upcoming film *Blown Away*, starring Jeff Bridges. *Sarah* is presently sitting in the Boston Harbor, being outfitted with an upper deck facade. We surmise she is about to meet her demise.

The tower and antennas have been rescued by former owner Alan Weiner, to be mounted on the *M/V Fury*, which sets sail in mid-October to the island of Nevis in the Caribbean. Hopes are that by winter the *M/V Fury* will be the first legal off-shore broadcaster — although Radio Brod may have stolen that title (see p. 54)



Gaining a camera perspective on what may be the tallest man-made structure in the western hemisphere is not easy. On closer look, that small outbuilding seen on our front cover is no small equipment shed! Our thanks to Dr. Adrian Peterson of Indianapolis for these pictures from Fargo, North Dakota.

Iran Bullies Swedish Radio

A Swedish radio station in the southern town of Malmo has been broadcasting in Persian. The Republic of Iran didn't like the idea so they sued the station, accusing it of breaking Swedish broadcasting law. According to the suit, the Malmo station encourages its listeners to "attack the interests of the Islamic Republic." Iran wants the station's license revoked.

You've Got a Friend in Russia

In case you've forgotten, there's no more propaganda on Radio Moscow International. RMI Chairman Arman Oganesya says it's true. Propaganda has been replaced with "objective information, the dissemination of knowledge and presentation of the international arena of the natural state interests which every country has." That's easy for him to say.

RMI claims a listenership of 100 million people every day. It broadcasts in 46 languages.

COMMUNICATIONS

China Radio International on AM in US

There's an AM radio station situated on the outskirts of Washington, D.C., that's calling itself New World Radio. Operating on 1120 kHz, it has just signed up China Radio International, which is now being broadcast on the station weekdays from 4:00 pm to 5:00 pm.

Zhao Xixin of the Chinese Embassy in Washington called the broadcast "an important event in the history of Sino-US cultural exchanges."

WUST is an all ethnic, multicultural station with a potential audience of over 4 million people. It joins KPLA, San Francisco, as the second (to our knowledge) US AM broadcast station to air RCI during the afternoon drive time.

Raincoat Charlie Arrested

William Irwin, K8CQR, of Debary, Florida, has been fined $2,000 by the FCC. Engineers from the Vero Beach, Florida, field office identified Irwin at his residence as being the station on 20 meters that identified itself only as "Raincoat Charlie."

The FCC said that "Mr. Irwin's sole purpose for being on the air appeared to many to be to harrass and ridicule other amateurs in a particularly vulgar way."

Raincoat Charlie had vowed on the air that the FCC would never catch him.

Oooops

The Detroit office of the FCC issued a Notice of Apparent Liability to Ronald E. Roop of Wapakoneta, Ohio, for illegal operation, and malicious interference to the Allen County, Ohio, Sheriff's Department radio system. FCC inspectors identified signals on 154.83 MHz as coming from Roop's truck. The embarrassing thing is that Roop is the police chief of Uniopolis, Ohio!

Fashionable Fine

Officials at the fashionable Beverly Hills School District in California got a surprise piece of mail the other week. It was a fine for $8,000. Seems someone was operating an illegal radio station from the school. The FCC was not amused or impressed.

The FCC Wants to Hear From You, America!

Are you really steamed because your local cable company has dropped the 24-hour Hogan's Heroes channel? Maybe you think you're paying altogether too much for the right to watch 50 channels of the Home Shopping Network. Now there's a way that you can be heard — in Washington, D.C., our Nation's capital!

Realizing just how seriously American's take their TV, the FCC has set up a 24-hours-a-day, 7-days-a-week cable TV "information" line.

Dial up 202-632-0004 and you'll be able to (1) complain about rates, (2) dropped programs and (3) anything else so long as it has something to do about cable TV, plus (4) obtain forms and (5) purchase copies of cable rules and regulations. If you'd like to complain in Spanish, please call 202-632-0100.

Scholarship Money for Hams

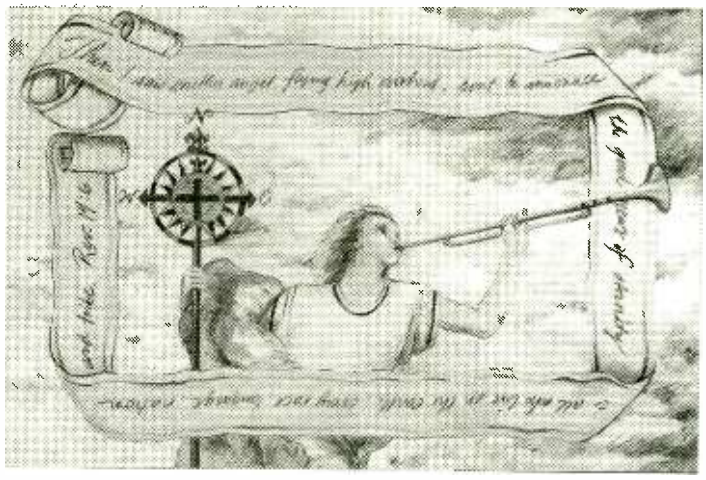
The Foundation for Amateur Radio administers a number of scholarships — 49 to be exact — for licensed hams. The amounts range from $500 to $2,000; qualifications differ. Should you or someone you know be interested in taking advantage of these generous offers, write FAR Scholarships, 6903 Rhode Island Avenue, College Park, Maryland 20740.

Winners are usually announced in August; in fact, their names can be found in the Ham Radio conference carried by the Grove Computer Bulletin Board System.

MT

"Communications" is written by Larry Miller, incorporating material submitted by the following readers and other VIPs: This month we thank Jack Albert, Dave Alpert, New York, New York; Anonymous Law Enforcement Officer, Wichita, Kansas; Patrick Colombo, Davie, Florida; S.C. Gibson, Lake Almanor, California; Maryanne Kehoe, Atlanta, Georgia; Paul Mitchell, New York; Andy Serra, Lake George, New York; John Salmi, Chelmsford, Massachusetts; Moe Terola, Schaumburg, Illinois; Gayle Van Horn, Brasstown, North Carolina; Yvon Johnson, San Francisco, California; Ira Paul, Oak Park, Michigan; Dr. Adrian M. Peterson, Karl Zuk, New York, New York; *National Scanning Report*; *World Broadcast Information* (BBC Monitoring Service) and *W5YI Report*.

WEWN



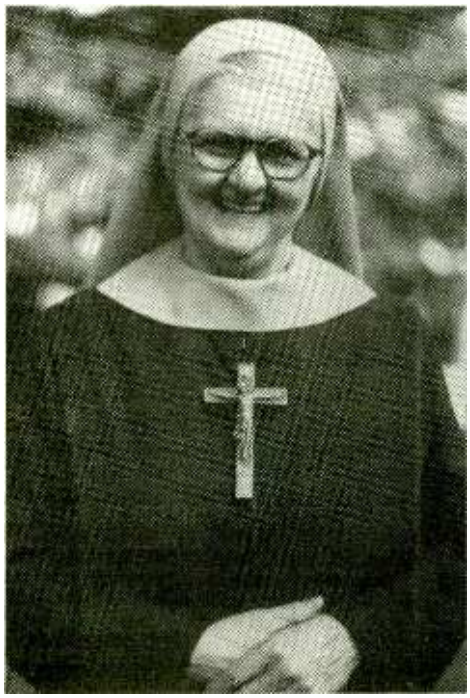
Shortwave Radio To Reach the Heart of the People

By John D. Stephens

For the past ten years, a steady stream of shortwave broadcast stations have come on the air from the United States, most with religious programming. The latest of these is WEWN — the Catholic radio service of the Eternal Word Television Network (EWTN), headquartered near Birmingham, Alabama.

Founded in 1981 and incorporated on August 15, 1991, EWTN has become the largest religious cable network in the world in terms of subscribers (30 million) and covers the continental United States, Canada, Alaska, Hawaii, Mexico, Puerto Rico, and most of Central America. EWTN's founder and Chairman of the Board, Mother M. Angelica, admits that building a cable network was never in her plans. "My desire to feed the people of God was a constant incentive," she says.

A cloistered Franciscan nun, Mother Angelica recognized the need to reach people in other parts of the world where television sets were few, and saw radio as the perfect tool to accomplish this goal. "My dream is to reach the common man," says Mother Angelica, "encourage him to pray and aspire to be holy, provide family programming, and be a vehicle of evangelization for the Church." A particular need was seen in the countries of Eastern Europe where, Mother Angelica says, "There are millions of people in these newly freed Communist countries who have never heard of God or who have been told there was no God. I want to reach the heart of these people".



Founder and Chairman of the Board of EWTN, Mother M. Angelica.

A Chance Meeting

With a shortwave broadcast station still in the "just a dream" phase, Mother Angelica's desire to add a worldwide radio voice for EWTN became well-known in Catholic religious circles, and ultimately came to the attention of a wealthy Dutch businessman and philanthropist, Piet Derksen, and his wife Trude. A devout Catholic, Mr. Derksen made his fortune in sportswear manufacturing and amusement park development before he retired.

Through a chance meeting, Mr. Derksen encountered Mother Angelica, who outlined her plans to spread the Catholic faith throughout the world via radio. Impressed with Mother Angelica's vision and determination, the Derksens donated all funds necessary to build what would soon become WEWN.

Original plans called for two transmitters to be located near Rome, Italy (where EWTN owns six production studios), and two near their headquarters just outside Birmingham, Alabama. But, after two fruitless years of trying to get a license to construct a station in Italy, Mother Angelica decided she no longer wanted to deal with the Italian government bureaucracy. She made plans to locate all four transmitters at a

J.D. Stephens

Transmitter master control room, complete with Yaesu FRG-8800 (upper left).

single site near the EWTN headquarters, Our Lady Of The Angels monastery, in the Birmingham suburb of Irondale.

The Work Begins

In April 1992, a suitable site was chosen atop one of Alabama's highest peaks — 1200 foot high Minor's Mountain at the border of Shelby and St. Clair counties, near the community of Vandiver. Only about 30 miles from the monastery, the site was convenient to EWTN headquarters. Covered with dense forest growth, over 100 acres of trees had to be cleared to make way for the antenna farm. Additionally, a manmade pond had to be drained, and special foundations needed to be constructed to provide sufficient stability for the antenna masts on the sloping terrain. Work on the transmitter building and maintenance buildings soon followed, and a target date of December 28, 1992, was set to begin regular broadcasts.

A Powerful Dilemma

Shortly after work began at the transmitter site, some local residents sued EWTN, saying they resented WEWN's use of an 80 year old logging road (which provides the only means of accessing the site at the top of the mountain), the clearing of the peak, and bringing in Alabama Power Company (also named in the lawsuit) to install a substation and run power lines to the station across land served by another, smaller power company — Coosa Valley Power. In conjunction with these grievances, some complaints were also entered citing decreased property values and destruction of the environment.

Although local residents had chosen to be served by Coosa Valley Power, WEWN is a large enough customer that it could make its own choice.

According to Alabama Power, establishing the powerline route to the station was handled according to standard procedures — complaints were heard, alternative routes were examined for running powerlines and accessing the mountaintop site, and court permission for right of way was obtained. An Alabama Power corporate spokesman summed up the situation by saying, "There will always be people not satisfied. It was a difficult location. The alternatives were not acceptable."

Officials of both EWTN and Alabama Power have been working on a solution and it seems now that the matter may soon be put to rest, as an Alabama Circuit Court judge recently ruled in favor of a proposed cash settlement by Alabama Power to some of the residents.

Time Flies

Work on the transmitter site, however, continued at a feverish pace. "I never saw time fly by fast," said Station Manager Frank Phillips, a former broadcast engineer for the Christian Science Monitor's WSHB in Cypress Creek, South Carolina. "Amidst work on all the other projects, our transmitter arrived here in the mud on September 14, 1992, before the transmitter building was even complete. Here we were with a startup date of less than four months, and we still had to complete the building, install four transmitters, and do our testing — all before December 28th."

With a couple of experienced engineers hired from the Voice of America's Phillippines relay station, as well as consulting engineers from Continental Electronics (the manufacturer of WEWN's transmitters), the first transmitter was readied for testing in what Mr. Phillips calls record time.

Tests of the first transmitter began in September of 1992, with a loop tape consisting of

J.D. Stephens

One of four 500 kW Continental 420-C transmitters.

WEWN's distinctive interval signal, interspersed with a station identification. Testing was conducted, accord Mr. Phillips, "in a very precise manner." Even though the output power for the transmitter was 500 kilowatts, a power of only 300 kilowatts was used while tests were being conducted, which reduced chances of equipment damage while engineers worked out any bugs in the system.

With testing complete, and construction on all the buildings finished, the on-air target date of December 28th arrived. On hand to dedicate the new station were the Derksen's, as well as Mother Angelica. Her dream became reality as the first broadcast commenced from WEWN, which surpassed WSHB as the largest privately-owned shortwave broadcasting station in the world.

A Brief Setback

Shortly after regular broadcasts began, a complaint was received from the Sheriff's department of neighboring St. Clair county. WEWN's signal was somehow causing interference to their radio communications. A spurious emission or harmonic was the culprit, and WEWN promptly ceased broadcasting until a solution to the problem could be engineered.

With the cooperation of the Sheriff's department, and even the Sheriff himself, they were able to explain the problem to the engineers at Continental, who, after about a week, engineered a solution. While the transmitter was being modified, WEWN engineers went to the Sheriff's department repeater site and reworked the system completely. They also installed a new ground system and various filters to help prevent any further interference. After about three weeks, WEWN returned to the air.

State of the Art Facilities

Piet Derksen's money ($20 million so far) has bought the best for WEWN, as their facilities are truly "state of the art." Four 500 kilowatt Continental 420-C transmitters pump out WEWN's programs to all corners of the globe. The newest model in their class, these transmitters are "the most modern and powerful made in the world today," says Matt Scalici, Senior Vice President of Engineering for EWTN.

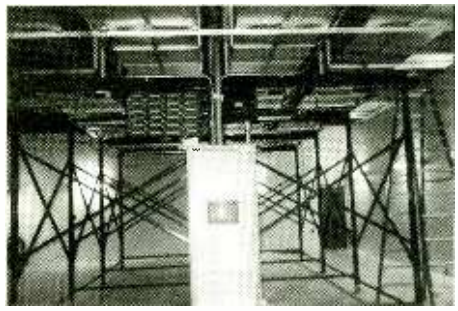
The computer-controlled 420-C utilizes a keyboard interface that allows operational commands to be entered quickly and easily. A video screen provides extensive graphic representations of every facet of the transmitter's operation, and is particularly adept at helping an engineer troubleshoot. Should a transmitter malfunction occur, engineers simply enter a quick command on the keyboard, and a detailed schematic of the transmitter appears on the screen, complete with the offending transmitter part flashing in an outline of yellow.

Each of the transmitters operates with a feature called Carrier Control Modulation (CCM), which is a method for reducing the amount of carrier that is transmitted. Use of CCM enables the transmitter to work less to get the same amount of power out to the sidebands. According to Mr. Phillips, "It operates under the same principle as the overdrive on a car."

WEWN Schedule

START		MHz	LANGUAGE
0000	0100	13.710	ENGLISH
0000	0100	9.410	ALBANIAN
0000	0700	7.425	ENGLISH
0000	0800	9.985	SPANISH
0100	0200	13.710	ARABIC
0100	0200	9.410	ROMANIAN
0200	0300	11.715	RUSSIAN
0200	0300	9.370	UKRAINIAN
0300	0400	9.370	BULGARIAN
0300	0400	11.580	BELARUSSIAN
0400	0500	9.350	CZECH/SLOVAK
0400	0500	9.370	LITHUANIAN
0500	0600	9.370	HUNGARIAN
0500	0600	9.350	SERBIAN/ CROATIAN
0600	0700	9.350	POLISH
0600	0700	13.710	ENGLISH
0700	0800	9.430	ENGLISH
0700	0800	11.580	ENGLISH
0700	0900	9.350	ENGLISH
0800	0900	11.580	DUTCH
0800	1000	9.985	PORTUGUESE
1200	1300	15.695	ENGLISH
1200	1500	9.350	ENGLISH
1200	2000	18.930	SPANISH
1300	1400	13.710	MANDARIN
1300	1700	17.535	ENGLISH
1400	1500	17.510	ARABIC
1500	1600	17.510	ENGLISH
1500	2000	11.735	SPANISH
1600	1700	15.695	DUTCH
1700	1800	15.695	FRENCH
1700	2200	13.615	ENGLISH
1800	2000	15.695	ENGLISH
2000	2100	17.840	SPANISH
2000	2200	15.695	FRENCH
2000	2200	18.930	PORTUGUESE
2100	2200	17.840	PORTUGUESE
2200	2300	13.615	GERMAN
2200	0000	17.760	SPANISH
2200	0000	11.820	PORTUGUESE
2200	0000	7.425	ENGLISH
2300	0000	15.650	MANDARIN

PLEASE NOTE: ALL TIMES ARE UTC. TIMES AND FREQUENCIES ARE SUBJECT TO CHANGE.



J.D. Stephens

The antenna switching matrix.

A huge, computerized, antenna-switching matrix occupies a large room directly behind the four transmitters. This point controls the transmitter feeds to four enormous curtain array antennas located around the perimeter of the 180 acre mountaintop complex. Should the need arise to switch antennas due to malfunction or any other reason, the change can be made within seconds by entering a couple of commands via a keyboard interface. The switching matrix also has a video screen, which operates in much the same manner as that of the transmitters.

Program signals are received at the transmitter site via satellite downlink and patched to the transmitter master control room. Up to four program channels at once can be received, and each channel is routed to one of four audio processing racks. Each rack corresponds to a specific transmitter. If a problem should occur with a certain transmitter, or any other piece of equipment that prohibits normal operations, any program can be rerouted to another transmitter with ease. "Coupled with our antenna switching matrix, we have total flexibility between programming, transmitters, and antennas," says Mr. Phillips.

No expense was spared in the construction of the transmitter building, either. Plush carpet, fine office furniture and other accommodations such as you would find in one of the nicer hotels were quite evident. There is even a guest room, complete with a bed and all the comforts of home!

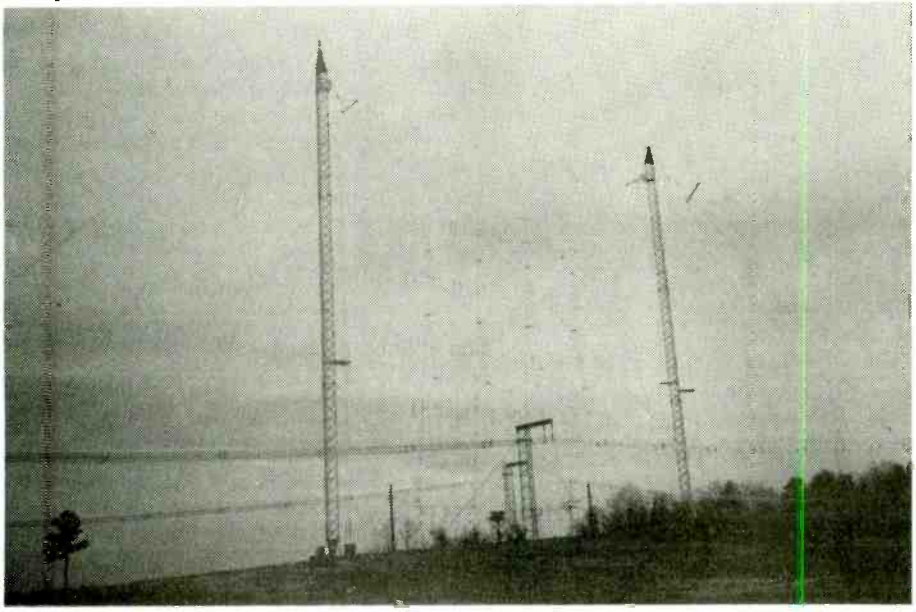
Solely Religious Programming

Current WEWN programming consists of scripture readings, prayer, audio from Mother Angelica's television show, and other devotional programs. To date, almost 7000 one-hour shows have been produced and prerecorded. Programs in English, French, Spanish, Portuguese, and Mandarin are recorded at the production studios at the monastery in Irondale,

with programs in 17 other languages recorded at EWTN studios in Italy. There are plans to add 30 more languages in the future.

WEWN programming is solely religious — no news, weather, current events programs, or DX tips. Manager says "We are Catholic, but I feel that a large part of our programming would be of interest to people of all faiths...Many of our listeners write to say... 'Even though you are a Catholic station, I find much of your programming equally applicable to me and my religion.'"

Within the first five months on the air, WEWN received almost 1500 reception reports from over 50 countries on all continents. Very pleased with the reception as reported by listeners, Mr. Phillips says that about 90 percent of the reception reports have indicated a SINPO rating of three and better, and about 80 percent indicate a rating of four and better. WEWN readily verifies reception reports with an attractive QSL card, and reports can be sent to P.O. Box 100234, Birmingham, Alabama 35210, USA. The station would very much appreciate a signal rating using the SINPO code (Signal, Interference, Noise, Propagation, Overall Merit, on a 1-5 scale).



J.D. Stephens

One of four curtain array antennas.

Looking to the Future

With her eye on the future, Mother Angelica has great plans for WEWN, and envisions being able to someday send prayer messages to any part of the world in the event of a catastrophe such as an earthquake, hurricane, or other disaster. "The most vital need for emergency victims is prayer," Mother Angelica says, "They need to pray." According to Mother, "Before the bulldozers get there, I want to get there and give them hope."

Don't Tune Out Those "Sleepy Suburbs"

By Dixie Daniels

When I first took my brand-new AR-1000 out of the box last May, I had no idea how soon I would fill up 1000 channels. With two states and multiple jurisdictions in our Kansas City metro area, and my fingers becoming button-numb (ever programmed an AR-1000?) I soon felt the temptation to skip over some of the sleepier little towns and 'burbs in the tiny print in *Police Call*. After all, nothing ever happens in towns with names like "Prairie Village," "Liberty," and "Bonner Springs," right?

Wrong, scanner friends! After a few months of happy and productive scanning, I have to warn you not to overlook the suburbs, "quiet" neighborhoods, and sleepy, one-horse towns in your own outlying areas. Even if it means adding another scanner to get those extra channels, or trading up. If you do, you're likely to miss plenty while you're tuned to Metro City's Main Dispatch, waiting for the latest drive-by shooting, carjacking, or free-for-all downtown!

Take ***Kansas City***. Please. Sure, we have an inner city with a crime problem to match anyone's. (Well, okay, maybe not LA, but it's enough.) A couple of summers ago, not one, but three, serial killers were on the loose within the same postage-stamp of pavement! Legs and torsos wash up on the banks of the Missouri with regularity. Just last spring an FBI agent was robbed and killed with his own gun. Yep, we've got weirdos a-plenty, right here in River City.

Harry Baughn

The sleepy mid-West, you say? Not so! This notorious retreat of outlaws still breeds plenty of scanning action—if you're prepared to hear it.

That's why my priority channel is set to Kansas City Police main dispatch (154.86). But more often than not, I end up turning that priority feature off, because I get tired of it interrupting the real action just to report another ho-hum, run-of-the-mill bank robbery or drug-crazed shootout, or another routine "body found in a dumpster."

Now take sleepy little ***Excelsior Springs***, by comparison. Home of the "Elms" mineral springs and health spa, and not much else. If there ever was a place where "nothing ever happens," this was it! Nothing, that is, except a murder-for-hire with a cast of characters right out of the Sunday night movie: a love triangle involving an older woman and her teenage lover, just like the notorious Pamela Smart case. Her husband was shot in a particularly bizarre plot after the teenager had told his intentions to all his friends, just like the Smart case.

But was I listening on that sunny Sunday afternoon when someone finally noticed the guy slumped half in and half out of his car? No, I had passed over that frequency (155.1) when I programmed my scanner! Seems every teenager in town knew about it, and who did it, but nobody bothered to call the police. Shades of "River's Edge..."

Right next to Excelsior Springs is ***Liberty,*** Missouri. Although it also houses a historic jail, today Liberty is a gracious little Southern-looking town where they could film a Hallmark Hall of Fame. Except that in another love triangle with a twist, a pair of lesbian lovers killed one of their husbands...the case is just now coming out from under wraps, but is reported to have been another premeditated one, with the motive being money. So much for sleepy, tree-lined Liberty! I'm staying out of love triangles (I hope) and those two little "sleepy" Missouri towns to our northeast!

On the other side of the metro area, way out west, is an even sleepier little town called Bonner Springs. Home of a Boy Scout camp and a rock quarry. Oh, and there's a Pizza Hut. Zzzzz. I couldn't be bothered with the frequency to ***Bonner Springs*** police (153.815), fire and rescue (153.77). After all, what could happen in Bonner Springs? Only a police chase for miles down a sleepy two-lane where the bad guys ended up going head-on into a semi. Ouch! Didn't hurt the semi, of course, but I had to hear about it on my CB instead of my scanner.

Since I got wise and honored Bonner Springs with a couple of channels on my scanner, an alert tollbooth operator noticed a driver trying to hide a very upset child in the back seat of a car, and police gave chase; a father shot his daughter's teenage boyfriend (it was ruled justifiable); and another semi crashed into the tollbooth to I-70 and went up in flames. Miraculously, the tollbooth operator escaped. While the CB chatter had the death toll escalating to ever more mythical proportions, my scanner told me the real story, and I was able to nose in on CB and reassure the drivers that no one was killed in the tollbooth inferno. All the same, next time I'm out that way, I'm not taking anything for granted!

Because you can't. Take conservative, no-yard-signs, no-basketball-hoops-in-the-driveway, no-RV's, no-boats, no-changing-the-oil ***Leawood***...home of the tree-lined, landscaped, Indian Creek jogging trail, plump housewives in pink sweats...and the "Leawood Flasher!" He hasn't been caught yet, but he seems to have graduated from springing out of the bushes, au naturel, and dancing a little jig, to beating women up in broad daylight, even women walking big dogs. It was funny while he was still a harmless flasher, but now that Leawood is in my scanner (453.275), if I hear another "flasher" call I'll be prepared with a camera and maybe a can of bright, fluorescent spray paint, just in case!

Farther from the madding crowd, there's Paola, Kansas, a little farm town. Just a few weeks ago in Paola, a sad-looking woman who had just remarried her ex-husband shot and killed him on their wedding night. The story was that he began battering her after they had received a congratulatory phone call on their remarriage, when he had given her strict orders not to tell anyone of the event. Tragic, but nothing too unusual, right? Not until her daughter testified that the whole thing was planned...the daughter said that the mother had boasted she would remarry him, kill him, and get the money. And then marry her boyfriend. (At this writing the case has not been resolved, but I've resolved that all may not be as it seems in Paola!)

Raytown, Missouri, takes by far the most abuse in the metro area, for many reasons.

Typically, the writers of "Mama's Family," the Carol Burnett sitcom, named their Bubbaville suburb, "Raytown." Raytown gets no respect. One reason is that it's the kind of place where "nothing ever happens." Except, if you had been monitoring 460.25 one day last June, you would have heard a SWAT team called to a sad little house whose owner had gone over the edge because they wouldn't play Hank Williams, Jr., on the radio.

Guess it was the last straw for Mr. Good-Ole-Boy America. He had called the country radio station earlier in the day and gone on so much about "Bocephus," his frenetic rambling alarmed the DJ's enough that they alerted the police. Right or wrong, Raytown's finest took a stand, and Bocephus' No. 1 Fan went out in a blaze of glory. Seems he had quite an arsenal in there, and a tear gas grenade intended to smoke him out brought him out shooting instead. Personally, I'd rather die for my right to own a scanner than my favorite country singer, but as any scanner buff can attest, there are some people with unusual tastes out there. And likely as not, they're right next door!

Belton, Missouri, is right next door to Raytown, and indistinguishable in ambiance—churches on every corner, and no perverts need apply. But recently, a nationwide FBI sting operation netted a system of 40 computer bulletin boards that traded child pornography online. Yes, one of the 40 was in Belton.

Knowing what I do about crime in the area, thanks to my favorite appliance, I live in ***Shawnee,*** Kansas, where in God's truth, REALLY nothing ever happens. (Except that torso they pulled out of the Kansas river a couple of summers ago...and me without my scanner!) Shawnee (460.075) has always been in my scanner, but it mostly serves as comic relief. One of the officers in the Rodney King incident had been a Shawnee officer for some years. Yet the defense in the King case claimed that the officer was a rookie and unfamiliar with police work. The prosecution countered with the officer's eight years in Shawnee, whereupon the defense responded, "I'm sure it's real, real dangerous, rounding up cattle out of the streets in Shawnee, Kansas."

Whereupon, Shawnee mayor Bob Best got his jockies in a real bunch: "This is typical, typical!" he protested, "of the West Coast and Hollywood's attitude toward the Midwest! Well, I'll have L.A. know that we have everything in Shawnee, Kansas, that they have in Big, Bad Ell-Lay!" Which made it exceedingly rich when I finally heard some action on the Shawnee frequency. You guessed it. "Report of a mule in the road...."

Lenexa, Kansas, is a twin suburb to Shawnee, only with fewer farm animals and more Radio Shacks. "Nothing ever happens" in Lenexa, either, but it was a good thing I had thought to put 460.1 in my scanner, just to be neighborly, or I'd have missed the Yuppie who went off with a machete in his apartment complex! Then there was the police call to see the woman about a snake in the basement...and just last week, an elderly couple answered a knock at their door in Lenexa to a robber who forced them to drive to their bank. However, the elderly man drove to the Lenexa police station instead and told the robber to get out of the car, which the robber did, and was caught! Whoever said Midwesterners were hardy, dogged, unflappable...okay, *stubborn*, may have been onto something.

A little to the northwest is ***Leavenworth,*** Kansas. What could possibly happen in Leavenworth? If you don't know, I'm not going to tell you. But if you'd been monitoring 170.875 last fall, you might have heard about a riot at a minor facility they have there. And more recently, I'm not kidding, a guy escaped out of Leavenworth (the prison) by tying together bedsheets. The guy was credited with devilish ingenuity, as he had a record of previous escapes from less secure facilities than Leavenworth. So when two weeks had gone by and he hadn't been caught, they assumed he was long gone. Imagine their surprise weeks later when he was found in the ceiling of a sleepy Leavenworth "greasy spoon" (the town, 39.66), where he had been living since the escape, sneaking out at night to pilfer food! At this writing the guards at Leavenworth are picketing for better security.

These are just a few of the small towns and suburbs around Kansas City where all the REAL action happens. There are many, many more, and you can bet after having kicked myself all over Kansas for missing some of these, I've got every one of them in my scanner now. Sure, there's still action a-plenty in the big city—why, just this past weekend, a guy minding his own business in a bar downtown was kidnapped by bounty hunters and slapped into handcuffs—to which the bounty hunters, incidentally, didn't have the key. Finally convinced they had the wrong guy (they did), the bumbling bounty hunters deposited their victim at the main police station, figuring the police could at least release the handcuffs. Unfortunately, the hapless victim had an outstanding warrant, and was promptly arrested, while the bounty hunters got away...

Still, you can stay tuned to the inner city if you aren't tired of the usual. I'll keep monitoring the suburbs, and when the year's out, we'll do a weirdness quotient.

Since turning on to scanning, I'm convinced of two things: there's nowhere you're "safe," and there's no time of day you can turn off your scanner because "nothing is happening!"

MT

KANSAS CITY AREA FREQUENCIES
Compiled by Dixie Daniels

KCK — Kansas City, Kansas
KCMO — Kansas City, Missouri

Send SASE to "Sleepy Suburbs" c.o Monitoring Times for the full list of Dixie Daniels' programmed frequencies, or download file "Sleepy" from the Grove BBS.

Freq	Description
39.22	Atchison, Leavenworth Police
39.4	Leavenworth Police
39.5	Osawatomie
39.54	Ottawa KS Police
39.56	Leavenworth Police
39.58	Mutual Aid
39.6	Osawatomie
39.64	Paola
39.66	Leavenworth, Tonganoxie Police
39.7	MutualAid
39.8	Paola Police
39.9	Paola Police
151.235	Shawnee Mission Park
151.515	Independence Center
151.625	Itinerant
151.775	Metro North
153.74	Lenexa Local
153.77	KC Fire, Bonner Spr. Amb. & Res.
153.815	KS Local
153.845	MO, KS Local
153.86	KS Local; Blue Springs
153.875	KS, Bonner Sp. Local
153.905	Lenexa, Gladstone, NKC Local
153.92	Prairie Village Police
153.935	KS Local; Platte City Police
153.965	KC Local; Bonner
153.995	Johnson Co Local
154.01	KC Fire; Raytown Local
154.025	Parkville; Platte City
154.04	Raytown Local
154.115	Independence
154.205	Johnson Co Fire, Medac
154.68	KS Turnpike Authority (?)
154.755	Overland Park Police; KC Police
154.77	Platte City Police
154.785	Mission, Olathe Fire, P. V.
154.80	Liberty Police Dispatch
154.815	Bl Sprs, Gr. Val, NKC Police
154.83	Johnson Co Police, KS Turnpike Police
154.845	Olathe Police
154.86	KC Police—Main Dispatcher!
154.92	Wyandotte County
154.95	Olathe, Johnson Co Police, KCK
154.98	NKC, Paola Local
154.995	MO State Prison-KC
155.01	Atchison; Excelsior Springs
155.025	KCK Local
155.04	Grandview
155.055	Bonner Springs Local
155.07	Raytown Police
155.085	Grain Valley; Liberty police
155.1	Olathe; Excelsior Springs
155.115	Clay Co, MO Local
155.145	UMKC; Belton
155.16	Truman, Sh. Missn. Med. Ctr.
155.175	Gold Cr. Amb., Independence; Olathe Hosp.
155.19	Johnson Co Police; Fire; KC Police
155.205	School Serv. & Leasing, Merriam
155.22	Pace School Bus Svc. (Independence)
155.235	B & J Bus Serv., KCMO
155.25	Platte City, County Police
155.265	Gold Cross Ambulance
155.28	Research, St. Luke's Hosp.
155.295	Jacks. Co. Sheriff's Posse!
155.34	KC Police & Hospital
155.37	Misc. Police incl. KCMO South
155.43	G'view Fire, KC Police, KCK West
155.475	Police & Mutual Aid
155.52	Wy. Co. Sheriff, Bonner Sp. Police
155.55	Grandview Police
155.565	Riverside; Bonner Sp.
155.58	Parkville Police
155.595	Clay Co, MO Police
155.61	KC Police; KCK detectives
155.625	Plt Cty; Lake Lot., Parkv. Pol
155.64	KC Police Citywide
155.655	Kearney; Smithville
155.67	MO Police Dept. of Corrections
155.7	Liberty Police
155.715	Platte City
155.745	Blue Springs Local
155.76	Civil Defense; Lake Quiv. Police
155.775	Wy. Co.; Smithville Police
155.79	Jackson Co. Police; Sheriff
155.805	Gladstone
155.82	Leavenworth Civ. Def; Lenexa Local
155.85	Overland Park, KC police Tactical
155.865	Johnson Co & MO Local
155.895	Bonner; WyCo Civ. Def.; spotters
155.91	Lees Summit Police
155.925	Shawnee Police; Roeland Park
155.955	Lenexa; KC State Hosp.
155.97	Jackson Co. Sheriff
155.985	KC MO, State Hosp.
156.00	Leavenworth Fire; B Spr; KC, MO St. Hosp.
156.015	KC, MO Local, prison?
156.03	Lees Summit Police
156.21	Jackson Co. Sheriff?
158.73	Johnson Co Police
158.745	Olathe Courthouse
158.775	Johnson Co Sheriff, South Base
158.805	Independence
158.82	Olathe Fire; Metro Emergency System
158.85	Overland Park Police; Leawood Police
158.895	Mission Sheriff
158.91	Kansas Turnpike Authority Police
158.94	KCK Local
158.97	Overland Park Police
159.00	Mission
159.03	JohnsonCo. Sheriff Mobile South
159.09	Lee's Summit
159.15	JohnsonCo. Sheriff Mobile North
159.225	Olathe Police
159.30	Johnson Co. Parks & Recreation—Shawnee
159.33	Olathe Police
159.585	Johnson Co Police
162.00	U.S. Post Office Base
164.45	KCK Local
165.065	Fort Leavenworth M.P.
170.875	Leavenworth Prison
172.125	KCK Local
172.15	KCK Local
453.15	KC MO Housing Authority
453.20	KC Local
453.25	NKC Local
453.275	Leawood Base
453.35	Leavenworth Police
453.375	KCK Local
453.40	KCK Local
453.425	KCMO Airport Police
453.45	Leawood Dis., P. Village, Lenexa
453.50	KC Local; Airport Police
453.525	NKC; Lee's Summit Local
453.60	Belton Police
453.625	Prairie Village, Mission
453.65	Overland Park Local
453.70	Leavenworth Local
453.725	KCMO Local; Airport Police
453.775	JCCC; Exc. Spr. Hous. Auth.
453.80	Independence Repeater
453.825	Olathe Police
453.95	Medact & Leawood base
453.975	KCK Local; KU Med.
458.1375	Olathe Police
458.15	KS Loc; KCMO Housing Authority
458.20	Leavenworth Police
458.2125	Johnson Co Police
458.2375	Johnson Co Police
458.25	MO & KS Local
458.275	Leawood Local
458.30	Independence Police
458.3125	Johnson Co Police
458.35	Leavenworth Police
458.3625	Johnson Co Police
458.375	KCK Local, MO Local
458.40	KCK Local
458.4125	Johnson Co Police
458.425	KC Repeater; Airport Security
458.45	Lenexa, Johnson Co, KS Police
458.50	KC Repeater? Airport Police
458.525	NKC Local
458.55	Independence
458.5875	Johnson Co Police
458.60	Belton, Independence Police, Fire
458.65	Overland Park Local
458.6625	Leavenworth Police
458.675	Independence
458.70	Leavenworth Local
458.80	Independence Police
458.825	MO Local; Olathe Police
458.85	Mission Fire; Independence Police
458.8625	Johnson Co Police
458.90	Lee's Summit Fire; Olathe Police
458.9375	NKC Local
458.95	Leawood Mobile Police
460.025	Raytown Police Base
460.0375	Lenexa Police
460.05	Lenexa Police
460.075	Shawnee Police Base
460.10	Lenexa Base, Mut. Aid, Johnson Co Wide
460.125	NKC Police Base
460.1375	Lenexa Police
460.15	Overland Park Local
460.175	Shawnee Police Base
460.2125	Lenexa Police
460.225	Overland Park Car-Car; Weather Watch
460.25	Leavenworth Police
460.2625	Lenexa Police
460.275	KS Police & KU Med.
460.2875	Lenexa Police
460.30	Metro Squad? KC Police
460.325	Lenexa Primary
460.35	Topeka?
460.375	Overland Park Base
460.4125	Lenexa Police
460.425	NKC Police
460.45	Lenexa Base
460.475	Topeka?
460.50	Overland Park Base
462.975	Ambulance, KC Police Base
463.20	Fact Finders Invest.
463.675	City Center Square
464.875	Ward Parkway
465.025	Raytown Police
465.0375	Lenexa Police
465.075	Shawnee Repeater
465.10	Shawnee, Lenexa Repeater
465.125	NKC Police
465.1375	Lenexa Police
465.175	Shawnee Repeater
465.2125	Lenexa Police
465.225	Overland Park Police
465.25	Leavenworth Police
465.2625	Lenexa Police
465.2875	Lenexa Police
465.30	Metro Squad? KCMO Police
465.325	Lenexa Police
465.375	Overland Park North
465.4125	Lenexa Police
465.425	NKC Police
465.45	Lenexa Police
465.50	Overland Park South
465.525	MO Amb Coord; KCMO Police
466.85	Plaza (Paired)
467.95	Ambulances
467.975	Ambulances
468.20	Fact Finders (Paired)
468.675	City C. Sq. (Paired)
469.875	W. Parkway (Paired)

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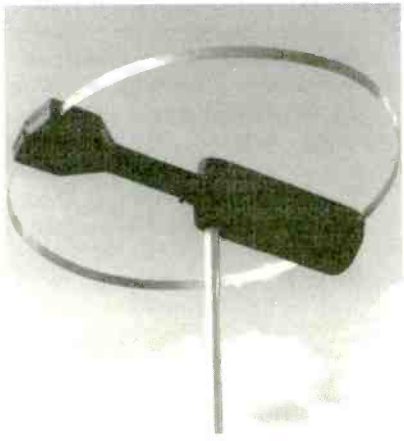

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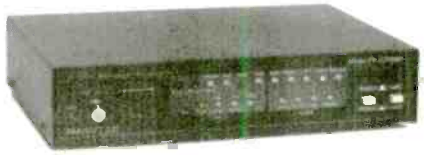

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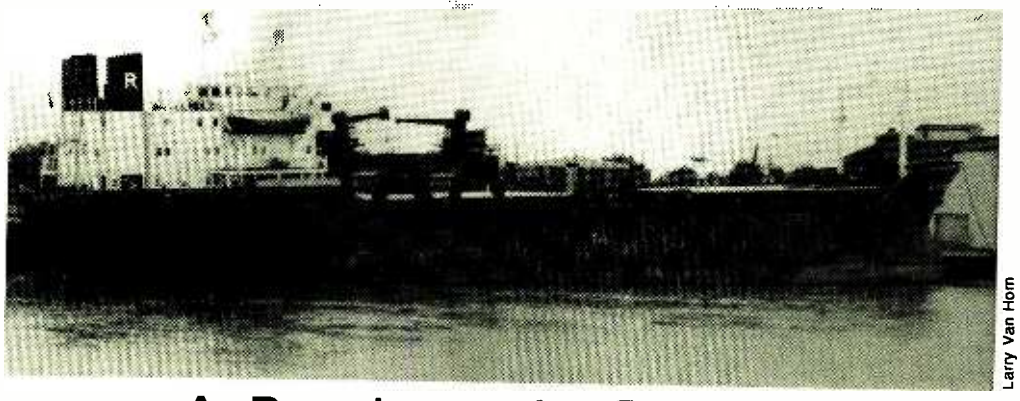


Larry Van Horn

A Beginner's Guide to Monitoring HF Marine Frequencies

By Raymond Troth, Jr.

Monitoring maritime radio traffic gives the ardent shortwave listener a challenging global nautical adventure. If you exercise patience over several days, you can trace voyages of seagoing vessels, almost hour by hour. If a breakdown takes place aboard a ship, you may learn about the self reliance and ingenuity of maritime professionals. You will gain respect for the skill of Mississippi Inland Waterway pilots. These master pilots maneuver 1200 foot long tows up and down this twisting, intricate waterway.

Getting Started

There are numerous modes and frequency plans for maritime communications, which have experienced a great deal of shifting due to changes in ITU (International Telecommunication Union) regulations in the past few years. Voice transmissions use either simplex operation, in which one frequency is used by both the calling and the receiving station, or duplex, in which two different frequencies are used, enabling simultaneous operation.

For the purposes of this article, we are listing the simplex frequencies only, since you will be able to hear both sides of the conversation. See Table 1. For a more complete layout of the maritime shortwave frequencies, refer to Grove's *Shortwave Directory*[1], just out in a new edition, or Ferrell's *Confidential Frequency List* by Geoff Halligey[2]. Both directories open flat (one is spiral bound and the other, looseleaf) making them easy to use near your receiver. Stations go on and off the air frequently, so consider this, both when assessing the up-to-dateness of the directory and the ease of entering loggings and updates.

Quite a number of stations are owned by individual marine companies, barge lines, etc., which operate their own HF USB coast stations in order to communicate with their own vessels. These radio stations in the Private Radio Service are not included in the Ferrell publication, but you will find a substantial list in the Grove directory.

When following the daily progress of vessels by call-in radio position reports, a good world atlas will show latitude and longitude grid lines. An excellent source of atlases are flea markets and used book sales at public libraries. The countries will probably be wrong, but the sea stays the same! You can estimate a ship's position by using these map grid lines. Most atlases show only every 5th degree line; others, every 10th or 20th line, depending on the scale. Remember, there are 60 minutes (divisions) and 60 seconds in each degree of latitude and longitude. 72 degrees 30 Minutes west (Longitude) places the position halfway between 72 and 73 degrees west of Greenwich, England. Using small maps makes seconds (1/60 minute) too small to estimate.

Most vessels give their positions in degrees, minutes and sometimes, seconds of latitude and longitude (written as 72°30'/08"W 40°46'/10"N). Others use land reference points or combinations of both.

0° longitude passes through Greenwich, England, the starting point for UTC (Universal Coordinated Time) or GMT (Greenwich Mean Time). Longitude is east and west of this line. 180° East and 180° West meet halfway around the world near the Hawaiian Islands. This is where east meets west, literally. It is also the International Date Line.

Mississippi towboats use landmarks, towns, buoys, locks, and river mile markers as reference points. Most of these reference points are not on readily available maps. A serious listener may need the navigation charts of the river system to find these vessels.

At the risk of sounding trite, keep a log! The form you use does not matter but recorded information makes future listening a lot easier. My own log sheet is simple: three ring, college ruled

Table 1: Simplex Maritime HF Frequencies
(All frequencies kHz)

U.S. Coast Guard COMSTA
2670 6501
Canadian Coast Guard COMSTA
2598 4408
Distress, Calling and Reply Channels
4125 6215 8255 12290 16420 22060 25097
Simplex Channels spaced 3 kHz apart
4125 4146 4149 6224 6227 6230 8291 8294 8297
12353 to 12365
16528 to 16546
18825 to 18843
22159 to 22177
25100 to 25118
Mississippi River simplex frequencies
4065 4089 4116 4408 6209 6212 6510 6513 8201 8213 8725 8737 12233 12362
13080 16417 16543 16546 17299

notebook paper. Record the radio call, name and position of the vessel heard as your minimum information. Recording the frequency and channel number will allow you to accumulate channel data for future use. Other details are your personal choice.

What to Listen For

Most oceangoing tugs and Mississippi Inland Waterway System tow boats send daily reports. Usually these reports are broadcast to coast stations at prearranged hours. Shipboard receivers can remain muted until called, reducing audio clutter in the pilot house. A system of selective calling, called ringers or selcal, activates muted receivers when called.

If you hear a series of tones resembling a hand cranked telephone ring with a short, steady higher pitched tone at the end, hang on. This is an electronic ringer calling a vessel. If you then hear a single two tone sequence with a low to high pitch, this is the answering tone. A short pause occurs and the vessel will answer with its call sign and hopefully, name.

Most call-in traffic occurs in the early evening and the early morning hours, local time. Listen around 2200 to 0200 UTC and again about 1300 UTC. Frequencies may be any simplex channel from 4 to 25 MHz. The evening reports usually are on 4, 6, 8 or 12 MHz.

The called in reports don't necessarily follow a fixed format. The information contained in the reports is longitude and latitude, speed in knots, weather, sea and wind conditions, distance traveled since the last reporting period, miles to go, ETA, and other information. These figures can reveal the length of the voyage.

On the Mississippi, barge dispatching and barge shifting is similar to railroad freight operations. The call-ins and dispatching occur in the afternoon between noon and 4:00 PM CST on 6510 kHz. Towboats use 4, 6 and 8 MHz for communication between boats when out of VHF radio range. The towboats converse during early evening hours on many interesting and diverse subjects.

Oceangoing ships frequently call other vessels of the same line or owner while underway. Formal communication reports or informal small talk between radio operators or officers is the usual traffic. Fishing vessels report on catches, areas with no fish, and sea conditions.

Familiarity Breeds Contempt

One of the frustrations of maritime service monitoring is picking up vessel names. Usually the radio call sign is readable, but the name of the vessel fades into an unreadable, under-modulated mumble. With single sideband it disappears into the noise. For some strange reason this name dropping is most common on the Mississippi Inland Waterway. When river men refer to other vessels during conversation the names are clear. When signing off, the modulation fades into the background noise along with the name. The Mississippi Captains all know each other and know who is on every boat they talk to. With this close association, vessel names become unimportant. In spite of this, it is possible to log a hundred vessels by name in just a few monitoring sessions.

The only available current and complete listing of individual vessel radio callsigns outside of government records is Lloyd's *Register of Ships*. Unfortunately, this extremely expensive volume is rarely found in public libraries. Lloyd's *Register* lists vessels alphabetically by name, not callsign. Lloyd's lists very few harbor tugs or barges. If you know the ship's name, you can confirm the callsign, but not vice versa. On the other hand, if you know the callsign, many ship names can be found identified in the *International Callsign Handbook* by Gayle Van Horn, published by Grove Enterprises. A less expensive alternative (but still not cheap) is the *List of Ship Stations* from the ITU. See the end of this article for the address[3].

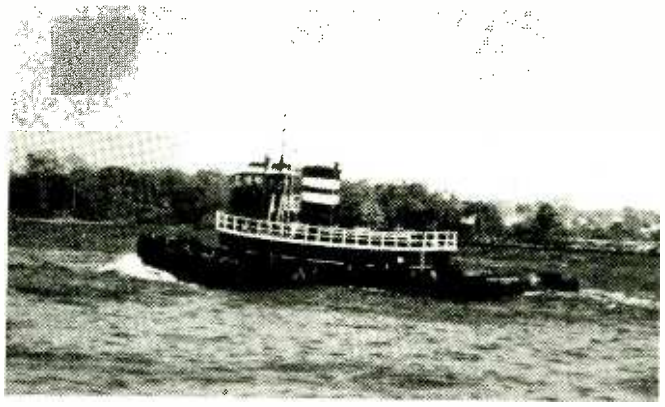
When and Where to Monitor

Follow the monthly radio propagation charts in *Monitoring Times* for peak frequency activity times. The 4 and 6 MHz frequencies are subject to night effect and work well after dark. 8 and 12 MHz work most of the time. 16 MHz and above work best during daylight. The newly assigned 22 and 25 MHz bands have not found much use as yet. When monitoring, try different frequency bands to see if one provides some unusual DX. I recently heard a motor yacht 19 miles off the coast of Africa at Lat 12W and Long 19N — a 2500 mile hop — on 6224 kHz.

Sometimes you will hear two vessels at a signal strength of S-9 or above, but they cannot hear each other. Listen for a message such as "shift to" or "go to." For instance, "go to 4 Megs." You can follow the conversation to the new frequency if the operator identifies it — 4125, for example. If not, it is a guessing game.

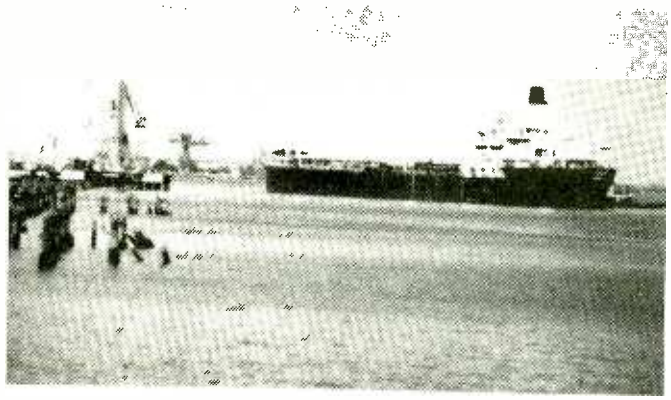
If the operators identify the new frequency by channel number, such as "go to Channel 4," you must know the equipment in use to find the channel. You probably will not find it except by chance.

8-Alpha usually refers to 8291 kHz; 12 Megs or 12 Alpha commonly refers to 12353 kHz. Your log is important: use it! Once you find a channel referred to by number or letter, you can locate it again. Some transceivers have more channels than others and operators may use their own channel identifiers. A good bet is to go to



Raymond Troth, Jr.

Tugboats such as the Steven McAllister provide interesting marine communications, especially navigating the mighty Mississippi.



Raymond Troth, Jr.

Oil drilling platforms and their supply ships communicate daily, helping you build up a valuable reference source through your log sheets.

the lowest simplex frequency in a given band and try there.

Not Quite According to the Book

If you find a conversation that you cannot read on a programmed receiver memory channel, don't immediately think your receiver is at fault. With a properly tuned receiver, an USB conversation sounding like Donald Duck is probably an off frequency transmission. If your receiver allows the memory channels to shift quickly into the VFO and back again, try this: Move the frequency, 8291 for example, to the VFO. Adjust the receiver frequency slightly up or down using the smallest frequency increments available on your receiver.

At some odd frequency, such as 8290.930 kHz, the message will often clear up and become readable. This is 170 Hz low, off frequency far enough to severely distort single sideband reception. In single sideband operation a frequency error as small as 30 Hz will cause noticeable distortion. Stations may also operate exactly 1 kHz above or below the listed frequency. This is common to foreign speaking operators trying to avoid co-channel interference. One large domestic bulk carrier fleet is 389 Hz off frequency on all vessels. This may be an equipment error in setting the frequency on these ships.

As an added complication, one vessel you are monitoring may be on frequency while the other one is off frequency. To hear these conversations, again put the frequency into the VFO and adjust the receiver for clearest reception. Then, switch back and forth between memory and the VFO, following the conversation. Using this method I recently monitored two British Registry ships with excellent results. Shipboard receivers have a "clarifier" circuit, adjustable from the control panel. All this does is to shift the receiver VFO slightly to hear a transmitter slightly off frequency, just as you are doing manually.

If you try all these techniques and the transmission still does not clear up, there is a good chance that the communications are encrypted.

What You May Hear

U.S. and Canadian Coast Guard Communications Stations (COMSTA) broadcast weather information at frequent intervals on various frequencies. The USCG uses 2670, 6501, 8719, 8764 and 13089 kHz. The Canadian CG uses 2598, 4408, 6513 kHz plus others. The Halifax, NS, station broadcasts weather every six hours from 0205 UTC and navigation warnings at the same interval beginning at 0335 UTC. On 2598 kHz, all Canadian CG stations broadcast these reports almost without pause. All the schedules appear in Grove's *Shortwave Directory* and Farrell's *Confidential Frequency List* mentioned earlier in this article.

Monitoring winter high seas weather reports will make any shortwave listener appreciate a warm home. In winter, seas sometimes run 28 feet with 40 to 50 knot gale winds and temperatures well below freezing. Superstructure icing and gale warnings occur frequently during North Atlantic winters.

Ice reports give vessels information about ice floe size, position and drift. They include ice conditions at ports in the northern U.S. and Canada. These broadcasts also note the type of ice—grey (navigable) and white (solid) vessels may encounter. (See the September and next month's "High Seas" columns on decoding weather observations from ships at sea.)

In June the Atlantic hurricane season begins. The Coast Guard COMSTA weather reports relay information about areas of low barometric pressure, the infancy stage of a potential hurricane. Year 'round, the Portsmouth, Virginia, COMSTA gives information on the Gulf Stream and the location of warm and cold eddies in the Atlantic.

Many tug and barge combinations ply the Atlantic along the U.S. coast, Gulf of Mexico and the Caribbean Sea. Small freighters regularly run between South and Central American ports and the Caribbean islands. Radio traffic for these vessels can become predictable after a few monitoring sessions, as you can see from the following examples.

On 8294 kHz I logged a conversation between the tug *Bruce McAllister* in the Gulf of Mexico and WPY476. The tug was once a part of McAllister Towing's Delaware River fleet, but the company has moved into the Gulf of Mexico and Mississippi River around Baton Rouge and New Orleans. Their boats use 8 MHz simplex regularly. A photo of another of the McAllister tugs, the *Steven McAllister*, is shown above. These colorful boats have black hulls with bright red superstructure and gleaming white trim. The red stacks have two white bands with a black cap. All their vessels carry the names of various members of the McAllister family.

KZU Harvey, LA, converses with oil drilling platforms and supply vessels every evening on 8297 and occasionally 12356 kHz between 2100 and 0300 UTC. KZU vessel names ending with "Tide" (*Wave Tide* etc.) are supply boats. Names beginning with Ocean (i.e. *Ocean Champion)* are oil drilling platforms.

Remember, all maritime traffic is protected by privacy of communication regulations. Don't let the rules frighten you; If you can monitor the frequency without special measures such as frequency hopping receivers or voice descramblers, you can listen. Monitoring is OK, but don't reveal to anyone the content of communications heard. If you purchase one of the guides recommended below, you will also find a wealth of activity on the duplex radio telephone channels, probably the most popular target for maritime monitoring.

Good luck in this interesting hobby. Add maritime monitoring to your listening, and it should bring you a renewed appreciation for your radio and for the life of a mariner. MT

[1] Grove Shortwave Directory, 8th Ed., edited by Bob Grove and Larry Van Horn, looseleaf format, listed by agency with frequency order crossreference. Available from Grove Enterprises.

[2] Ferrell's Confidential Frequency List, 8th Ed., Geoff Halligey, spiral bound, frequency order. Available from Grove Enterprises.

[3] Send for catalog of ITU publications to International Telecommunication Union, General Secretariat - Sales Section; Place des Nations; CH-1211 Geneva 20; Switzerland.

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AUSTRALIAN ARMY RADIO: *Morale Booster to the Troops*

By Dr. Adrian M. Peterson

In recent time, many DXers and international radio monitors worldwide have reported hearing the unique new shortwave service for Australian troops serving in the peacekeeping forces in Somalia and Kampuchea (Cambodia). These broadcasts have been radiated over transmitters located at three different radio bases in Australia, and they form an interesting update to the entire story of radio broadcasting by the Australian Army Amenities Service (AAAS). This is the story, which has its beginnings during World War 2.

Middle East

The first radio broadcasting unit for Australian Forces was a mobile studio which was commissioned in Australia in June 1942 and shipped to the Middle East. Originally, it was intended that this mobile radio studio would broadcast back to Australia with war news and information from North Africa and the Middle East. However, because the shortwave transmitter had an output of only 1 kW, these intended broadcasts became impractical. Consequently, the mobile studio was used mainly for producing programs in the battle areas and broadcasting them over local radio transmitters.

Pacific Islands

During the Pacific theater of World War 2, a series of some 21 mobile radio stations were constructed in Australia, tested late at night from locations in Melbourne and Sydney, and then shipped to forward areas. These stations were rated with a power output ranging from 10 watts up to 200 watts. On one occasion, and quite by chance, I heard one of these stations, at a distance of some 500 miles. It was 9AF, with 200 watts on 1440 kHz, broadcasting a test program from Melbourne late at night.

These AAAS stations were based in the main areas of Australian troop deployment in the Pacific islands and were supplementary to the larger number of American Armed Forces Radio Stations in the same areas. The whole series of callsigns for the AAAS stations at the time ranged from 9AB to 9AP.

Many of these stations were transported from place to place according to the movement of the armed forces in the various stages of the Pacific war. One of the stations, 9AG with 200 watts on 1340 kHz, was established at Balikpapan in Borneo. When the Australian troops moved forward, this station was handed over to the Dutch authorities, and it became the local station in the Nirom network.

In addition, several other stations which were constructed locally in forward battle areas, or which were taken over from a retreating enemy. Such stations as "Radio RAAF Milne Bay" and "RAAF Radio Madang" were well known in the area at the time.

At Pt. Moresby in New Guinea, a 500 watt station on 1250 kHz was officially opened by General Douglas MacArthur on February 26, 1944. The first allotted callsign was 9PA, but this was soon changed to 9AA, signifying its status as the parent station for all of the forward stations with callsigns in the 9A series. The QSL letter that I received from this station lists the call as 9PA, when in reality, as an Army station at the time, it was really 9AA.

Australia

In addition to the testing of the mobile MW stations in the twin cities, Melbourne and Sydney, additional army stations have been established in other areas of mainland Australia. These have operaten generally on the medium wave band, though one in particular was a shortwave broadcaster.

At Darwin in Australia's Northern Territory, a MW station was established in 1944. This was 5DR, standing for Darwin Radio. It was in use as an Army station for two years, and then it was taken over by the government broadcasting service, the Australian Broadcasting Commission, as the Northern Territory relay station for the ABC home service network. This station was

AUSTRALIAN MILITARY FORCES—NORTHERN TERRITORY FORCE

QUOTE IN REPLY G // 45

Headquarters AA AMENITIES SERVICE
5 DR BROADCASTING STATION
31 July 45

Mr. Adrian M. Paterson
Charleston, S. Aust.

RECEPTION OF 5 DR

1. Ref your letter of 16 July 45, the details submitted correspond with our programme of Mon 16 July 45.

2. We were very pleased to receive your report and would greatly appreciate details of any future reception of this station.

.....(B. Wright)...Lieut
OC 5 DR BROADCASTING STATION

The medium wave station 5DR was an Army station for two years.

later designated as 8DR, and its callsign has since been changed to 8RN.

Soon after the war was over, an experimental broadcasting service was launched from an air force base at Higgensfield in North Queensland. This station announced as "Radio RAAF No 2," identifying the Air Force unit that was operating it. The 100 watt transmitter on 1470 kHz was on the air in August 1945, with the intent of launching an entertainment/information radio service, but the project was abandoned.

Then, in 1955, the first Army shortwave station came onto the air unannounced, from Puckapunyal in Victoria. This station radiated 2 watts on 7850 kHz, and it was on the air just two hours per week in November 1955.

Ship Stations

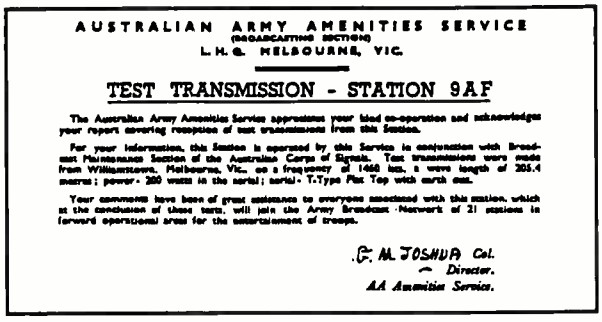
Towards the end of the Pacific war, a 50 year old wooden ship, the *Apache*, was fitted out in Sydney Harbour as a radio station an sent up to the Philippines. This station, announcing as WVLC, took over some of the Australian shortwave broadcasts from VLC Shepparton and it also relayed American AFRTS and VOA programs, over a channel in the 7 MHz band.

In addition, several warships in the Pacific — British, Australian and American — began to relay programs from Australian MW stations to surrounding areas on shortwave. One of these, for example, was the *HMS Grenville*, which was heard relaying the commercial programs from 2KY Sydney in January 1946.

More recently, some of the larger Australian Navy vessels have incorporated a radio station as part of their onboard entertainment facilities. In some cases, these stations have radiated programs over a MW transmitter, and in other cases, programs are available on board the ship via closed circuit cable. One of the ships, *HMAS Canberra* for example, was stationed off the coast of Vietnam during the South East Asian conflict.

Japan and Korea

During the era of occupation in Japan, at least four of the mobile 9A stations were taken to Japan. These were incorporated into existing Japanese stations and were allocated callsigns in the American W series. For example, the 10 watt station, 9AQ was located near Kure in Japan. It was first identified as WVTX and then later as WLKU. All of these stations were broadcasting on MW, but one of them, 9AL - WVTV-WLKS was also broadcasting for a while on shortwave.



AUSTRALIAN ARMY AMENITIES SERVICE
(BROADCASTING SECTION)
L.H.Q. MELBOURNE, VIC.

TEST TRANSMISSION - STATION 9AF

The Australian Army Amenities Service appreciates your kind co-operation and acknowledges your report covering reception of test transmissions from this Station.

For your information, this Station is operated by this Service in conjunction with Broadcast Maintenance Section of the Australian Corps of Signals. Test transmissions were made from Williamstown, Melbourne, Vic., on a frequency of 1460 kcs., a wave length of 205.4 metres; power - 200 watts in the aerial; aerial - T-Type Flat Top with earth mat.

Your comments have been of great assistance to everyone associated with this station, which at the conclusion of these tests, will join the Army Broadcast Network of 21 stations in forward operational areas for the entertainment of troops.

C. M. JOSHUA Col.
Director.
AA Amenities Service.

Mobile transmitters such as 9AF were tested in Australia before being deployed in the Pacific theater.

When the Korean offensive began, Australian troops also moved into the peninsula, and so too did some of their radio stations — as many as four of them.

Vietnam

Along with the American "Good morning Vietnam" series of AFRTS stations, there were also a couple of Australian stations located in Vietnam as well. One of these was a 500 watt station broadcasting from Vung Tau on 1040 kHz. Another station was located for a while at Hue, very near the larger VOA and AFRTS stations.

Malaysia

Back in 1960, on July 1 to be exact, a rather substantive radio station was established by the Royal Australian Airforce at Butterworth on the Malay peninsula, just across from the island of Penang. This AAAS station broadcast from two 500 watt transmitters, using each on alternate days, both at 50% reduced power. They also had a choice of two simple antennas, an inverted L and a folded dipole. This station was occasionally heard further afield, and on several occasions, I heard it in India and Sri Lanka. Radio RAAF Butterworth served some 5,000 Australian personnel at the air base. It left the air when Butterworth was closed in the late 1980's.

Egypt

A small closed circuit AAAS station, located at Ismailia in Egypt, was operating for a few years, simultaneously with RAAF Butterworth.

Recent Developments

The latest endeavor in AAAS broadcasting made its appearance unheralded, unannounced and unexpected. Some time last year, a new shortwave service for Australian forces serving in Somalia came onto the air. At first, the half hour programs were broadcast from one of the 250 kilowatt shortwave transmitters of Radio Australia located on Cox Peninsula near Darwin in the Northern Territory. Some DXers in North America were successful in hearing this station, but I was never able to log it myself.

A while afterwards, DXers in Europe and elsewhere reported hearing similar programming on other channels not listed for Radio Australia.

Subsequent information has revealed that these transmissions are coming from two different locations. One is VHP, the large Navy radio station located at Belconnen near Canberra, Australia's capital city. The other is NMC-VLF, the America radio facility located near Exmouth at North West Cape in a Western Australian coastal area. These transmissions are now on the air several times a day from both locations. Studio facilities are housed in one of the government offices in Canberra, and the first broadcast each day is presented live.

The broadcasts from Exmouth are directed towards Somalia on Mondays and Fridays only, and the broadcasts from Belconnen are directed daily towards Kampuchea (Cambodia). Programming consists of contemporary music interspersed with calls from relatives in Australia to servicemen on ships and in Somalia and Kampuchea. Each program is one hour long, and each is heard in Upper Sideband mode, USB.

The schedule for these transmissions at present is shown in Table 1. MT

Table 1

Note: Broadcasts to Somalia Monday and Friday only

UTC	kHz	kW	Call	Location	Target
0300	23678.5	40	VHP	Belconnen	Kampuchea
0300	19037.5	10	NWC	Exmouth	Somalia
0900	20418.5	40	VHP	Belconnen	Kampuchea
0900	25322.5	10	NWC	Exmouth	Somalia
1200	12070.5	40	VHP	Belconnen	Kampuchea
1400	13508.5	10	NWC	Exmouth	Somalia

Reception reports for these transmissions are welcomed and should be addressed to:

Department of Defence
Mr. Hugh McKenzie
Electronic Media Unit
Anzac Park West 1/B/07
Reid ACT 2600.
Australia

VERIFICATION CARD

QSL QSL

Station...R.A.A.F.............
Location..BUTTERWORTH
Frequency....1445...KHZ
Wavelength..MW.............
Power 0:400..Kw..........
Date..OCTOBER...15...1974.
Time 1433-1600...(G.M.T.)

RADIO RAAF BUTTERWORTH

Your reception report has been examined and found correct.

STATION RUBBER STAMP

Station Manager's Signature

AUSTRALIAN ARMY AMENITIES SERVICE

A.A.A.S.

STATION

9 A F

POWER 200 WATTS

LOCATION, WILLIAMSTOWN

VICTORIA

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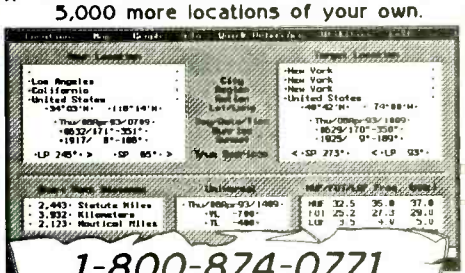

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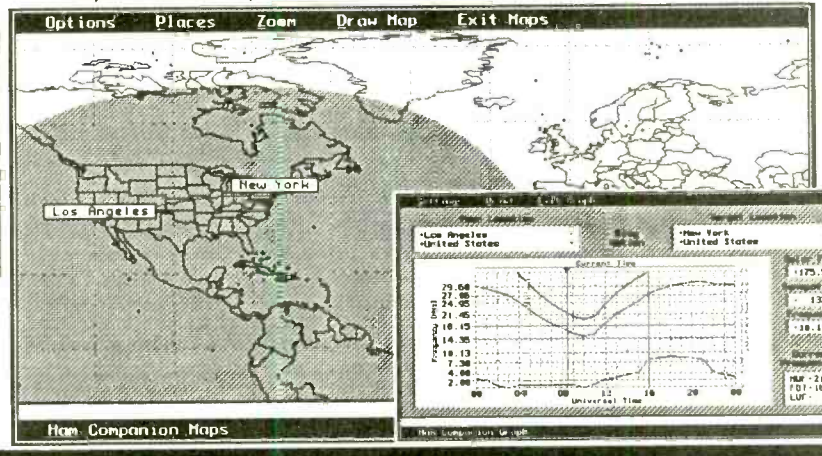

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A GLIMPSE INTO THE NAVY'S CRYSTAL BOX

By Jack Sullivan

Hamfests are great places to find the unexpected, even if you're not a ham. Gadgets and equipment of all sorts are there in abundance for the sharp and critical eye to pick out the occasional gem. Such was the situation when I had a display at a hamfest at the State Fairgrounds in Timonium, Maryland.

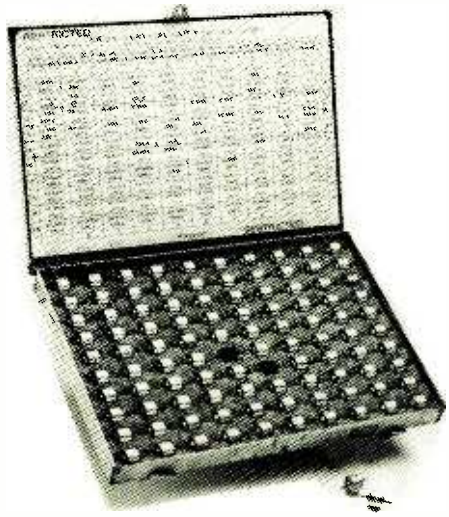
The fellow at the table next to mine was selling a small truckload of ham and computer gear. He struck up a conversation with a prospective buyer about the fact that he had no information about a dirty off-grey flat steel box filled with 100 shiny silver barrel-shaped crystals. My curiosity piqued, I picked up one of the two boxes he was selling and examined it carefully.

The cover bore the legend CASE, CRYSTAL UNIT SET CY-1180/U. CRYSTAL UNIT TYPE CR-24/U. FOR MODEL AN/URR-13/U RADIO RECEIVER. Under that had been written in marker pen **FOR AN/URR-35**. In the lower left corner was the U.S. Navy contract number (with a 1952 date) and the name of the crystal set's manufacturer, Bliley Electric Co., Erie, PA. The lid of the box also bore the remnants of a number of pieces of masking tape, on one of which had been marked the date "9-19-78" and some other figures.

Inside the box was protective foam padding in which sat ten rows of ten barrel-shaped CR-24/U crystals originally designed in the late 1940s for the early single-frequency, single-conversion UHF-AM military receiver, nomenclatured AN/URR-13. These same crystals were also used in the later model (double conversion AN/URR-35). On the inside of the lid cover was a grid containing the printed number of each crystal, its oscillator frequency and the frequency in the UHF-AM (Uniform) band that it enabled the equipment to receive. There were also the prominent warnings: RESTRICTED and SECURITY INFORMATION.

It took me only a few seconds to figure out that I had picked up an unexpected gem. Ten dollars later, I sat back to study my new acquisition more closely.

The box alone was a true "diamond in the rough" (see photos). Not being familiar with either receiver, the odd-shaped crystals would have been easy to overlook, as would the drab, dirty box. But as a military aircraft communications enthusiast, I quickly surmised the intelligence bonanza provided by the frequencies of these crystals.



The crystal box's contents—100 crystals for the AN/URR-13/35 Receivers—RESTRICTED SECURITY INFORMATION.

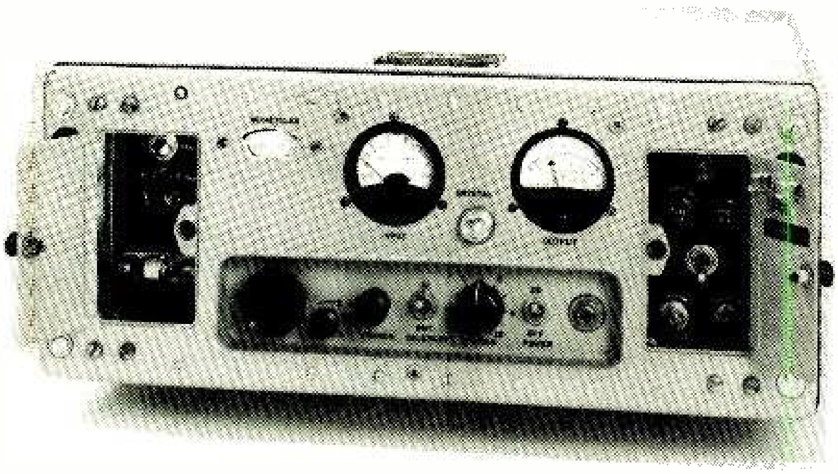
In the late 1940s and early 1950s, when the UHF military band between 225 and 400 MHz was first being developed, single frequency, crystal controlled radios were the state of the radio engineering art. The AN/URR-13 was one of the first receivers designed for this band. It was primarily a Navy development. The AN/URR-13 and the later AN/URR-35 equipped both ship and shore stations throughout the Korean and Vietnam Wars and well into the 1980s. Mounted in racks in radio compartments and delivering audio remotely to shipboard functions such as bridge, combat information center and landing signals officer, these radios were the heart of naval air-to-surface and ship-to-ship as well as ship-to-shore communications for over 30 years.

The function of the crystal box became clear after a little analysis. Checking the 100 frequencies against my computer database, it quickly became apparent that better than 90% of these crystals were for channels that are still used for various purposes by the U.S. Navy forty years later (see tabulation).

Several channels, such as 257.8 (civilian control towers) and 255.4 (FAA Flight Service for military aircraft), had obvious functions. Some other "special use frequencies" were no surprise: 277.8 (Fleet Tactical Warning) and 359.4 (Harbor Control Common), as well as 381.8 (Coast Guard Operations Common — the Coast Guard comes under Navy control during wartime and shares compatible communications capability with the Navy.

It was a little surprising to identify AICC (Airborne Intercept Control Common, 364.2) in the channel lineup. This is a worldwide air defense interceptor dispatch assignment, mostly used in the United States by the Air Force. Most interesting, however, was the discovery that ten channels either had no recorded Navy assignments, or seem not to be assigned to anyone, anywhere.

These crystal boxes were deployed on every U.S. Naval vessel and at Naval shore installations. The frequencies of the crystals had been



The author's AN/URR-13 in operation (crystal can be seen in its holder in the left access compartment).

carefully chosen and assigned to the U.S. Navy on a worldwide basis, either as an exclusive assignment (such as 236.2 and 249.8) or on a shared, multi-service basis (such as 243.0, 381.8 and 364.2.) Depending upon the mission of the vessel or shore installation, crystals were selected from the set for installation in the URR receivers. The channels 243.0 and 277.8 were circled in pencil on the chart in my crystal box.

Guard (243.0) would have been selected in every case, as it is standard operating procedure for all military units to constantly monitor this emergency frequency for distress calls or other urgent communications. The second channel would have served the tactical purpose of fleet warning, a universally used ship-to-air, ship-to-ship and ship-to-shore calling and warning frequency.

This particular set was apparently in service on a minor vessel or at a shore installation. A major vessel, such as an aircraft carrier, would have been using many more frequencies.

Implications

Here is my speculation regarding the frequencies with no apparent current assignment or use by the Navy or anyone else: all of the channels in the military UHF band have definite assignments or uses, even if no use appears to be made of them at the moment. These crystals may represent a potentially significant lead to monitoring important communications traffic. There is every likelihood that these channels, like most of the crystal set, are still assigned to the Navy. There is also a good likelihood that these are being held in a reserve "pool" for use in special operations or emergencies, such as a state of war or natural disaster.

The fact that no one has heard traffic on these channels may be the most significant fact about these frequencies. Like any communications system, the security level of the communications decreases as the amount of traffic increases. The only absolutely secure communications system is the one that is "never" used until absolutely needed. Maybe my "diamond in the rough" will present some interesting and exciting monitoring in the future.

MT

U.S. Navy Crystals

Crystal #	Freq	Representative Assignments
1-1	233.8	PEARL HARBOR NAVAL STATION, NAVAL AIR TEST CENTER, CHARLESTON NAVAL BASE
1-2	234.6	** USAF AIR DEFENSE (NORTHWEST/SOUTHWEST SECTORS)
1-3	236.2	PACIFIC MISSILE TEST CENTER, YORKTOWN WEAPONS STATION, UNDERWATER SOUND LAB
1-4	237.8	CHERRY POINT MARINE AIR STATION, GROTON UNDERWATER SOUND LAB
1-5	243.0	* EMERGENCY (GUARD)
1-6	249.8	FACSFAC VACAPES, MIRAMAR NAVAL AIR STATION, USS ENTERPRISE (VAW-133)
1-7	250.6	LAKEHURST NAVAL AIR ENGINEERING CENTER, MARINE AIR STATION NEW RIVER
1-8	251.4	BEAUFORT MARINE AIR STATION, GREAT LAKES TRAINING CENTER, LONG BEACH NAVAL STATION
1-9	253.8	MIRAMAR NAVAL AIR STATION, ALSO AIR FORCE (TYNDALL AFB)
1-10	255.4	* FLIGHT SERVICE
2-1	256.2	YUMA AND EL TORO MARINE AIR STATIONS, BOGUE MARINE AUXILIARY AIRFIELD
2-2	257.8	* CONTROL TOWER COMMON
2-3	258.6	LEMOORE AND WHIDBEY ISLAND NAVAL AIR STATIONS

Crystal #	Freq	Representative Assignments
2-4	262.6	EL TORO, YUMA, CHERRY POINT MARINE AIR STATIONS, BOGUE MARINE AUX. AIRFIELD
2-5	263.4	BRUNSWICK, NORTH ISLAND, OCEANA, JACKSONVILLE NAVAL AIR STATIONS
2-6	264.2	ROOSEVELT ROADS, ATLANTA, NEW ORLEANS, CHASE FIELD NAVAL AIR STATIONS
2-7	265.0	BARBERS POINT, KEY WEST NAVAL AIR STATIONS, QUANTICO MARINE AIRFIELD
2-8	265.8	ROOSEVELT ROADS, FALLON, OCEANA, MAYPORT, CORPUS CHRISTI NAVAL AIR STATIONS
2-9	267.4	FALLON, ROOSEVELT ROADS, OCEANA, MAYPORT NAVAL AIR STATIONS, ANDREWS NAF
2-10	268.2	CHERRY POINT MARINE AIR STATION (ALSO AIR FORCE IN NEVADA)
3-1	269.8	FENTRESS NAVAL AUXILIARY FIELD, KEY WEST NAS, BARKING SANDS PMRF
3-2	270.6	FACSFAC SAN DIEGO, BERMUDA NAVAL AIR STATIONS, CHERRY POINT MARINE AIR STATION
3-3	271.4	EL CENTRO NAVAL AIR FIELD, BARBERS POINT AND FALLON NAVAL AIR STATIONS
3-4	273.0	LONG BEACH, SAN DIEGO, SEAL BEACH NAVAL STATIONS, EL TORO MARINE AIR STATION
3-5	273.8	ROOSEVELT ROADS, OCEANA, JACKSONVILLE NAVAL AIR STATIONS
3-6	274.6	JACKSONVILLE, CECIL FIELD, WHITING FIELD NAVAL AIR STATIONS
3-7	275.4	ALAMEDA, NORFOLK, WHITING FIELD, NEW ORLEANS NAVAL AIR STATIONS
3-8	277.0	EL TORO MARINE AIR STATION, PATUXENT RIVER NAVAL
4-1	280.2	NORTH ISLAND, MIRAMAR, ALAMEDA NAVAL AIR STATIONS, ANDREWS NAF
4-2	283.4	CAMP PENDLETON, CAMP LEJEUNE, BEAUFORT MARINE, PENSACOLA NAVAL AIR STATION
4-3	285.0	ROOSEVELT ROADS, BRUNSWICK, JACKSONVILLE, KEY WEST NAVAL AIR STATIONS
4-4	285.8	BRUNSWICK, OCEANA, KEY WEST, CECIL FIELD, NEW ORLEANS NAVAL AIR STATIONS
4-5	289.8	NORTH ISLAND, MIRAMAR, PENSACOLA, DALLAS NAVAL AIR STATIONS
4-6	291.4	ROOSEVELT ROADS NAVAL AIR STATION, NEW RIVER MARINE AIR STATION
4-7	299.4	NEW LONDON SUB BASE, PATUXENT RIVER NAVAL AIR STATION, NORFOLK SHIPYARD
4-8	301.0	OCEANA, WHITING FIELD, PENSACOIA, MERIDIAN NAVAL AIR STATIONS
4-9	302.6	GLENVIEW NAVAL AIR STATION, ANDREWS NAVAL AIRFIELD (P-3 COMMAND POSTS)
4-10	304.2	ROOSEVELT ROADS, NORFOLK, PENSACOLA, WHITING FIELD NAVAL AIR STATIONS
5-1	305.0	MOFFETT FIELD, ADAK NAVAL AIR STATIONS, CHERRY POINT MARINE AIR STATION
5-2	305.8	CORPUS CHRISTI, NEW ORLEANS, JACKSONVILLE NAVAL AIR STATIONS
5-3	307.4	CHERRY POINT MARINE AIR STATION, ANDREWS NAVAL AIRFIELD, ANTISUB OPS
5-4	309.0	KEY WEST NAVAL AIR STATION, EL CENTRO NAVAL AIRFIELD, CAMP LEJEUNE MARINE
5-5	310.6	EL TORO, YUMA, TUSTIN MARINE AIR STATIONS, FALLON NAVAL AIR STATION
5-6	312.2	SOUTH WEYMOUTH, MAYPORT, PENSACOLA NAVAL AIR STATIONS, PACIFIC MISSILE TEST
5-7	313.8	EL TORO AND BEAUFORT MARINE AIR STATIONS, CONCORD WEAPONS STATION
5-8	315.4	KINGSVILLE, PENSACOLA, JACKSONVILLE, OCEANA NAVAL AIR STATIONS
5-9	317.0	LEMOORE, ROOSEVELT ROADS, CECIL FIELD, WHITING FIELD NAVAL AIR STATIONS
5-10	318.6	DETROIT NAVAL AIR FIELD (SELFRIDGE AIR NATIONAL GUARD BASE)
6-1	320.2	SOUTH WEYMOUTH, ALAMEDA, ROOSEVELT ROADS NAVAL AIR STATIONS
6-2	321.8	LONG BEACH, SEAL BEACH NAVAL STATIONS, DETROIT NAVAL AIRFIELD
6-3	323.4	ROOSEVELT ROADS, OCEANA, JACKSONVILLE NAVA AIR STATIONS
6-4	325.0	NAVAL AMPHIBIOUS SCHOOL, LITTLE CREEK AMPHIBIOUS BASE
6-5	326.6	SAN DIEGO NAVAL STATION, CAMP LEJEUNE MARINE BASE, PENSACOLA NAVAL AIR STATION
6-6	328.2	WHITING FIELD, ROOSEVELT ROADS NAVAL AIR STATIONS, NEW RIVER MARINE
6-7	329.8	**NO LISTINGS
6-8	330.6	**NO LISTINGS
6-9	333.0	**NO LISTINGS
6-10	334.6	**NO LISTINGS
7-1	336.2	EL TORO MARINE, CAMP PENDLETON, ALAMEDA NAVAL AIR STATION
7-2	337.8	CROWS LANDING NAVAL AUXILIARY FIELD, OCEANA NAVAL AIR STATION
7-3	339.4	POINT MUGU NAVAL AIR WEAPONS STATION, DAM NECK COMBAT TRAINING CENTER
7-4	341.0	MOFFETT FIELD, NORFOLK, ALAMEDA NAVAL AIR STATIONS
7-5	342.6	BARBERS POINT, KEY WEST, NEW ORLEANS NAVAL AIR STATIONS
7-6	344.2	EL TORO, TUSTIN, BEAUFORT MARINE AIR STATIONS, WHIDBEY ISLAND NAVAL AIR STA
7-7	345.8	LONG BEACH, SAN DIEGHO, SAN FRANCISCO NAVAL STATIONS
7-8	346.6	BEAUFORT MARINE AIR STATION, LONG BEACH, SAN DIEGO NAVAL STATIONS
7-9	349.0	**FAA (NORTHEAST PHILADELPHIA AIRPORT CONTROL TOWER)
7-10	349.8	FACSFAC SAN DIEGO, OCEANA, NORFOLK, CORPUS CHRISTI NAVAL AIR STATIONS
8-1	350.6	BRUNSWICK, WHITING FIELD, KINGSVILLE NAVAL AIR STATIONS
8-2	352.2	NEWPORT NAVAL CENTER, SAN DIEGO NAVAL OCEAN SYSTEMS CENTER
8-3	353.0	CHINA LAKE NAVAL AIR WEAPONS STATION, CHERRY POINT MARINE AIR STATION
8-4	354.6	LITTLE CREEK AMPHIBIOUS BASE, NORFOLK, KEY WEST NAVAL AIR STATIONS
8-5	355.4	CORPUS CHRISTI, DALLAS NAVAL AIR STATIONS, COMMAND PLANE LINKS
8-6	356.2	PATUXENT RIVER NAVAL AIR STATION, CHERRY POINT MARINE AIR STATION
8-7	357.0	FACSFAC JACKSONVILLE (ALSO AIR FORCE)
8-8	357.8	INDIANAPOLIS NAVAL AVIONICS CENTER, CECIL FIELD NAVAL AIR STATION
8-9	358.6	YUMA MARINE AIR STATION, OCEANA, PENSACOLA NAVAL AIR STATIONS
8-10	359.4	* HARBOR CONTROL COMMON
9-1	361.0	ROOSEVELT ROADS, NORFOLK, OCEANA, JACKSONVILLE NAVAL AIR STATIONS
9-2	361.8	EL CENTRO NAVAL AIR FIELD, MIRAMAR NAVAL AIR STATION
9-3	362.6	ROOSEVELT ROADS, MIRAMAR, PATUXENT RIVER NAVAL AIR STATIONS
9-4	363.4	SOUTH WEYMOUTH, OCEANA, CECIL FIELD NAVAL AIR STATIONS
9-5	364.2	* AIR INTERCEPT CONTROL COMMON (AICC)
9-6	365.8	** ONE ARMY LISTING AT FORT BLISS
9-7	367.4	* NATIONWIDE NAVY SECONDARY AIRCRAFT CONTROL CHECK-IN FREQUENCY
9-8	368.2	**NO LISTINGS
9-9	369.8	ONE ARMY LISTING AT FORT HOOD
9-10	370.6	**NO LISTINGS
10-1	371.4	**AIR FORCE IN ALASKA
10-2	373.8	FACSFAC SAN DIEGO, CHINA LAKE NAVAL AIR WEAPONS STATION (ALSO U.S. ARMY)
10-3	381.8	COAST GUARD COMMON, CHINA LAKE NAVAL AIR STATION
10-4	383.4	CHINA LAKE NAVAL AIR STATION
10-5	384.2	FALLON NAVAL AIR STATION, EL CENTRO MARINE AIR STATION, PACIFIC OCEAN
10-6	385.0	TUSTIN MARINE, EL TORO MARINE AIR STATIONS, PACIFIC OCEAN
10-7	385.8	**NO LISTINGS
10-8	386.6	NAVY TACTICAL
10-9	387.4	EL TORO MARINE AIR STATION, CAMP PENDLETON MARINE AIR FIELD, OCEANA NAVAL AIR STATION
10-10	389.8	EL TORO MARINE AIR STATION

Key: *Special Use or Shared Frequency
**No listings or No Navy listings
(FACSFAC=Fleet Area Control and Surveillance Facility)

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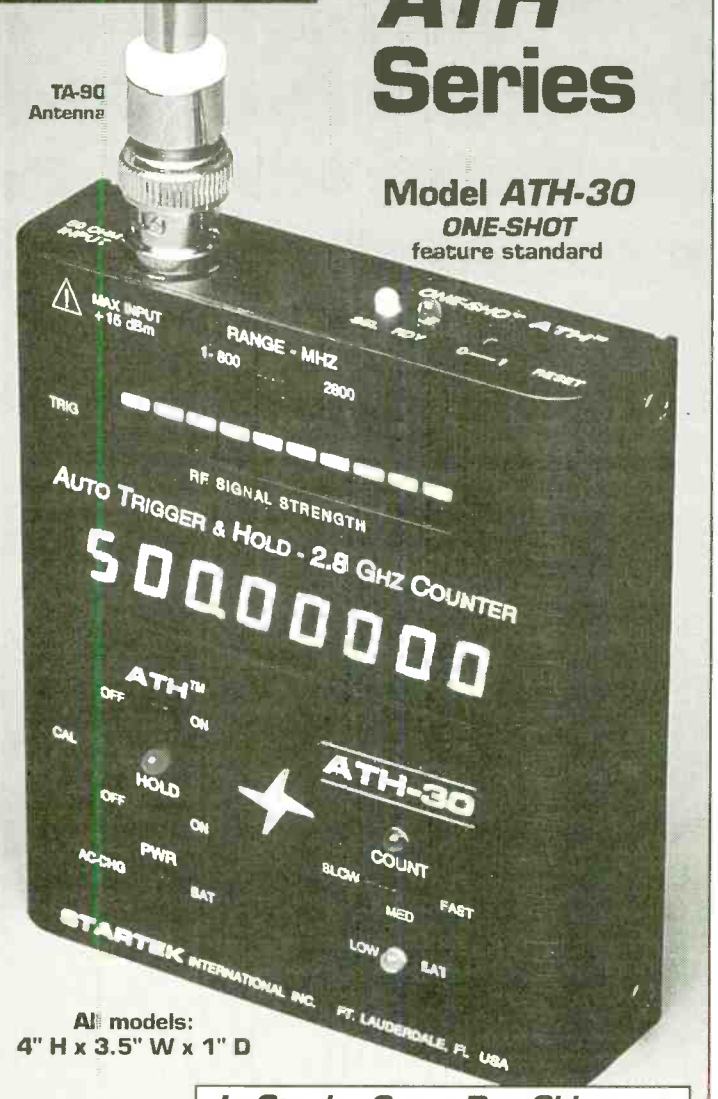

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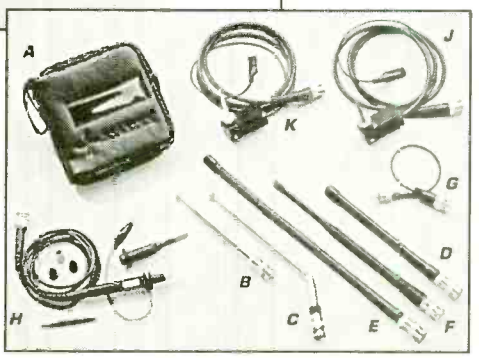
B	***TA-90***	Telescope BNC antenna	12.
C	***TA-90-L***	Telescope elbow antenna	16.
D	***RD-150***	150 MHZ rubber duck	16.
E	***RD-2750***	27-50 MHZ rubber duck	28.
F	***RD-800***	800 MHZ rubber duck	29.
G	***M-207-IC***	Interface cable for MFJ-207	10.
H	***P-110***	200 MHZ, 1x, 10x probe	39.
J	***LP-22***	Lo-Pass, audio usage probe	25.
K	***DC-10***	Direct, 50 OHM probe	20.



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// means parallel; + means continuing but not monitored;
= 2 x indicates 2nd harmonic of following frequency.

ALASKA [& non] KNLS tentative plans as of 29 April to start 27 Sept.: 0800 English, 0900 Russian, 1000 Mandarin on 7365; 1100 Russian on 6150; 1200 Mandarin on 7365; 1300 English, 1400 Mandarin, 1700-1800 Russian on 7355. Also since 5 March has Mandarin Fri., Sat. and Sun. 1300-1500 on 19 meters (subject to change) via Novosibirsk, Russia; DX reports appreciated, but these transmissions cannot be QSLed (KNLS) Why not?? (gh) Has been on 11970 (Wolfgang Büschel, Germany)

ALBANIA R. Tirana made further external service cutbacks, to only eight foreign languages and 20 [sic] minutes per transmission, while programs for Albanians abroad have increased (ATA News Agency via BBC Monitoring) Two of the four English broadcasts cut from 30 minutes to 15: 0230 on 11840, 9580; 2200 on 11815, 9760, 1395; others still 30 minutes—0130 on 11840, 9580, 1430 on 9760, 7155 (BBCM) Actually 12 minutes at 2200 ex-2130 measured on 9759.54v and 11824.65v (RVI *Radio World*, via Büschel, Cline)

ARMENIA Letter from Levon Ananikian, Chief Director of "Arax" [note spelling] Radioagency enclosed schedule in English including 0245-0300 on 11675, 13765, 15330 (Chris Sweitzer, NASWA *Journal*) One hour later in winter, but has been on 11790 and 10344-USB; also in English daily 1845-1900 to Mideast on 15350, 9675, 6065, 4990, 4810 (BBCM)

AUSTRALIA R. Australia added more *Australian News*, Mon.-Fri. 0110, 0510, 1110, 1710, and at two of these times also on weekends. *Innovations* airs Mon. 1130, 1530, 1930; musical variety from different cultures, Fr. 1330, 1730, Sat. 0330 (*World of Radio*) *International Report* moved to 0030 Mon.-Fri. and 2-hourly; *Background Report* at same times Sat., Sun. (Bill Westenhaver, *W.O.R.*) *Pacific News* Mon.-Fri. 0710, 1910 (BBCM) Shepparton replacing antennas, bad news for S. Pacific, N. America, Europe (Mike Bird, RN*MN*)

BELGIUM RVI already switched 17540 to 21810 for Asia at 1300 exc. Sun. 1130; W-93 sked from Sept. 26 continues this along with 15540 to N. America but at 1400 Mon.-Sat.; 0030 on 7370 and 9930 ex-13655 (Wolfgang Büschel, Germany)

BOLIVIA On 4903.9 evenings only 2130-0045 or 0100v is Radio de la Palabra, or Ondas de la Palabra, seems to be in Santa Ana de Yacuma; Catholic programs, always closing with Lord's Prayer; don't confuse with another nearby station in mornings from *1045 on 4901.0, Radio San Ignacio (Henrik Klemetz, Colombia) Correct frequency for R. Ecología Internacional, July *MT*, was 4441.3 (Klemetz, *WRTH LA*)

BRAZIL R. Progresso, Porto Velho, reactivated 4945.1, good signal at 1030 (Santiago San Gil, Venezuela) R. Tropical is new name for R. Aruanã on 4854.97, around 1000 from Barra do Garças, Mato Grosso (Takayuki Inoue N., *Relámpago DX* via *Radio Nuevo Mundo*)

CAMBODIA Khmer Rouge station on 5408 with English at 0100 and 1300 daily changed name, poorly translated, to Voice of the Friend [sic] of Great National Unity of Cambodia (Victor Goonetilleke, Shri Lanka, Radio Netherlands *Media Network*)

COLOMBIA R. Macarena, 5975 at 1220, has left Todelar affiliation for religious net Cadena Radial Auténtica. Harmonics: R. La Voz de las Estrellas, Cartagena at 2220 on 2940 so fundamental is 1470, not listed 1480; R. Ondas del Porvenir, Samacá, at 1130 on 4350 = 3 x 1450, Todelar. On one occasion, clandestine R. Patria Libre at 0045 on 5910, countered by R. El Pueblo Responde on 5913 (Santiago San Gil, Venezuela) R. Santa Fe reactivated 4965.4 (J.E. Österholm, Finland via Klemetz)

COSTA RICA RFPI new programs: *Gray Matters*—international news analysis and media criticism from Des Preston, Ann Arbor, Tue. 2000, Wed. 0400 and 1200 (Preston) *Radio Bandung*—magazine by NYC collective of Asian/Pacific producers, with progressive political analyses, news and culture not often heard on mainstream U.S. radio, 2nd and 4th Fris. 2300, plus eight hours later; *The Food Not Bombs Radio Network*, activist group in San Francisco also working to feed the homeless, monthly on 2nd Sat. 2200 plus 8 and 16 hours later; *Walden's Pond*, from WBAI NY, Shelton Walden and guests on animal rights, environment, politics, health, 1st and 3rd Sats. 2130 plus repeats (Joe Bernard, RFPI) REE at Cariari de Pococí, not Potosí as in Sept. (Klemetz)

CHILE R. Triunfal Evangélica reactivated 5825 in late July after 2.5 year absence, now clandestine, using provisional quad antenna at 0000-0300 from near Santiago, says director, Bishop Fernando González Segura, but I could not hear it in Santiago itself (Gabriel Iván Barrera, Argentina, RN*Radio-Enlace*) R. Esperanza, Temuco on 6090.0 at 1030 on a Saturday, news at 1045 (Santiago San Gil, Venezuela) And one week earlier also on 6090.0, new transmitter as expected? Had been on 6088.7 (Hans Johnson & David M. Clark, *DX Ontario*) QSL says 1300-0200, weekends also 0400-1200 (Cedric Marshall, *DXO*)

ESTONIA Estonian Radio making deep cuts, especially in foreign languages, no longer English news at 1520-1530, but still *Estonia Today* on SW Mon. & Thu. 2030-2100 (BNS News Agency and R. Estonia via BBCM) That would be on 5925, winter timing 2130 (gh)

GERMANY DW previews on N. American service: UT Wed. Sept. 29 at 0330, *Insight*—Realism follows Joy, Germany after reunification. UT Mon. Oct. 4 at 0115, 0315, 0515, *Living in Germany*—Würzburg, one of Bavaria's Jewels. UT Wed. Oct. 6 at 0330, *Insight*—the last Arab/Israeli War (*Tune-In* via Diane Mauer, Gigi Lytle)

GUAM The 8.1 earthquake Aug. 8 cracked the KTWR studio/office building, made a shambles of the inside, but transmitters and antennas were not damaged. Due to limited power only one transmitter could be used for a while (TWR-NC press release) Other station KSDA had some damage to a building, and feeder line, putting one transmitter off the air for seven hours; several thousand tapes strewn over the floor. Nearby KFBS and KHBI Saipan, KHBN Palau not damaged (Dr. Adrian Peterson, IN)

GUIANA FRENCH RFO new address: B.P. 7031, F-97305 Cayenne (RIAS DX via Hans-Peter Tillmann, British DX Club)

INDONESIA VOI previously used or announced 11785, 7125 but now all external services to Europe, Mideast, Asia, Australia and America are on 11752, 9675; English hours at 0100, 0800, 2000 (BBCM) Demonstrates profound ignorance at VOI of basic SW propagation, using same frequencies to all areas at all hours; the 0100 broadcast supposedly for us is far less likely to be heard than the 0800 beamed elsewhere (gh)

RRI Pontianak official schedule says 50kW on 9705 at 0300-0715, but actually on 9708 at 0100-0800 (Thaliep, IRLC via Foster, *OzDX* via *DX Ontario*) Check just before 0800 for possible fade-up (David M. Clark, *DXO* ed.) Kalimantan is using two time zones, Samarinda and Banjarmasin on UT+8, Pontianak and Palangkaraya on UT+7 (David Clark, ODXA via Martin, *OzDX*)

Verie signers at RRI stations: Fak Fak, Richart [sic] Tan; Sorong, Mrs. Tien Widarsanto (Richard A. D'Angelo, PA, World DX Club) RRI building five new 250 kW transmitters in Ujung Pandang, four more at

Cimanggis, for domestic coverage (BBCM) Presumably SW!

INTERNATIONAL VACUUM WHRI changed satellite feeds from South Bend to Noblesville, so *World of Radio* can be heard on Galaxy 4, Transponder 15, 99 degrees west, on 7.55 MHz subcarrier ex-7.37 MHz for S. American service on 9495; 7.46 MHz for European service on 7315, 13760; may also test 7.64 MHz for KWHR, Hawaii; see schedule last month under USA.

INTERNATIONAL WATERS Info from Becker about the radio ship project is not reliable. On *Crossband* program, Johnny Lightning disclosed the station is named Voyager Broadcasting International. Scott Fybush of WBZ visited the ship for *Spectrum*, in one of the worst sections of the harbor in East Boston, interviewed Captain and First Officer. Vessel is named *Fury V*, destined for Caribbean not Mediterranean, and at the time Becker was trying to get license finalized by St. Kitts & Nevis. Bro. R.G. Stair is the cash source. (Steve Coletti, FIDONET *SW Echo* via George Thurman)

IRAN [non] V. of Mojahed announced 9640, 9240, 9060, 8840, 7470, 7180, 7000, 6780, 6560, 6520, 6270, 6005, 5870, 5740 at 1400-1900, repeated 0200-0600, 0600-0800; from Iraq (BBCM)

ISRAEL Left DST already Sept. 5, so English one hour later, and frequencies added for the 0500 news (*Calling All Listeners*, Israel Radio) 7465, 9435, 17545, but 1400-1425 Sun.-Thu. on only two, 15640, 15650; 2000-2030 and 2230-2300 on 7465, 9435, 11585, 11603, 11675, 17575. Hebrew 24 hours with 9388 at 1430-0700 (Kol Israel via Steven Cline)

JAPAN R. Japan's *Crosscurrents* topic in Oct. is "How I Stay Healthy," essays by listeners; listen for announcements about future topics, deadlines (via Tom Kuca, NY) 11875 ex-11725 at 0500 (Brian Alexander, PA) BBC Z-93 frequency schedule omitted transmitter sites on two frequencies, believed to be Yamata—11765 at 0900-1330 and 15370 at 2100-0030, both 290 degrees in English and Mandarin (via Dan Ferguson, VOA, *SWL-List* via Will Martin)

KAZAKHSTAN R. Almaty best on 15270 in English at 1700-1730; many other frequencies more or less useless (Friedrich Büttner, Germany, DSWCI *SW News*)

KIRIBATI R. Kiribati left 17440 for 9825 at 0600-0800, lower frequency for better winter coverage (Dave Olney, Australia, RN*MN*) All I hear there is BBC in Polish, English (Steven Cline, IN) 9825 heard at 0600-0930*v, but is just temporary; going to a lower frequency soon. First noted by David Foster (David Martin, *OzDX, SW Possums* via *SW Echo* via Thurman) 9825 audible 0600-0621+ (Gigi Lytle, TX)

KOREA NORTH The station on 1612.9 kHz is the same one as on 3000.5 and 3025.4—Broadcasting for Young Soldiers on Sentry Duty. All sign on at *1400 (Tsutomu Kito, Japan, *OzDX*) No. 3025.4 opens at *1300 (Kito in DSWCI *SW News*, BDXC *Communication*)

KURDISTAN [non?] V. of Independent Kurdistan heard on 7330 at 1400 with ID going from Kurdish to Turkish until 1445*; supports PKK, hostile to Turkish policy, last heard in March on 7030 (BBCM)

LATVIA R. Riga now calls itself R. Latvia International (Hans-Peter Tillmann, BDXC *Communication*) R. Riga is now the name of a new joint venture with Germany to begin Oct. 15, with news in Latvian, Russian, English and German 24 hours (Ivars Belte, R. Riga, BNS news agency via BBCM) Only on AM or FM?

LIBERIA ELWA noted on 3230 with Christian music, ID at 2231 (Kath Denley, England, WDXC *Contact*) Beware, 3230 also scheduled for R. Oranje, South Africa before 2200 and after 0300 until 0455 (via Bill Westenhaver) ELWA also on 4760 at 1900-2300, ID on the hour, announcing 60 and 90 meters, religious program in American English, vernaculars (Christoph Ratzer, Austria, via Büschel) HCJB had been predicting ELWA comeback after civil war destruction (gh) Pro-Nigerian ECOMOG Radio ELBC, Monrovia, again on 7275 at 0900 at June end and since; was reported to have been "withdrawn" in May. The pro-Charles Taylor Radio ELBC in Gbargna continues to broadcast (BBCM) 7275 from *0700 or *0705; ELWA also *0555-0700+ on 4760 (Brian Alexander, PA)

LITHUANIA R. Vilnius secured English till yearend by corporate financial support (BBCM) Should be at 0000 for winter, but where?

MADAGASCAR R. Mad., Malagasy service heard 1500-1900* on 3358.9 // 5008.9, seems ex-3232; had used 3360, 3370 (BBCM)

MALI CRI relay at 0000 to N. America on 9780 ex-9770 // 11715 (Bruce MacGibbon, OR, R. Japan *Media Roundup*)

MOLDOVA [non] RMI via Romania, daily 25-min. broadcasts: 0900 Spanish 9510, 1100 Spanish 15105, 1200 Romanian 15335, 1235 French 17800, 1800 French 11950, 2030 Spanish 15220, 2230 Romanian 15220, 0030 Spanish 15135; the 09, 12, 2230 and 0030 to America, rest to Europe; one hour later during winter (BBCM) Presumably beginning Sept. 26 (gh) Same schedule effective June 8 to Sept. 4, but not daily; Mon.-Fri. for the 18, 2030, 2230 and 0030 [sic], Tue.-Sat. for the 09, 11, 12 and 1235; address is Soseaua Hincestilor 64, 277028 Chisinau. Phone 00373(?)-2-721388; fax 722537 (Harald Süss, Austria, via Büschel) Adding English soon, then Ukrainian, Russian (V. of Russia *DX Club* via BBCM)

MONACO TWR in English from Oct. 24 at 0740-0920 (Sat. 0935, Sun. 0945) on 7385 ex-9480 an hour earlier (TWR) QRM to RFPI

MYANMAR Defence Forces Broadcasting Unit at 1100-1332* on 6570 (Christoph Ratzer, Tibet, via Büschel)

NEPAL R. Nepal, domestic service on two of : 7165, 5005, 3230, including 10-minute English news daily at 0215, 1315, 1415 during 0015-0515, 0715-1715 transmissions (BBCM)

NETHERLANDS Expect a major policy announcement around Oct. 1 about a major reorganization for R. Netherlands. Each language service has to justify itself—why should RN broadcast in English when BBC is doing a pretty good job just 150 miles away? We provide a different approach and get enough response to indicate it's worth the effort. We have 16 people in the English section, whereas DW has 60. A new RN will emerge in 1994, in what form and size no one yet knows (Jonathan R. Marks, RN, *Internet* via Peter Costello)

NETH. ANTILLES RN forced off a day in Aug. by Chinese shrimp clogging water cooling (RN*MN*)

NEW ZEALAND Kiwi Radio's Gordon Barclay is getting a license, since the authorities are tired of busting him (Steve Coletti, *Spectrum*)

PARAGUAY Undated program schedule from R. Nacional has English segment Tue. & Thu. 1735-1745; morning magazine often heard with Paraguayan music is titled *Mbaapohára opáyvo* in Guaraní, Mon.-Sat. 0705-0855. Another music show, *Cuerdas maravillosas* is at 1005-1030 exc. Sun. Classical music, Mon.-Fri. 2305-2400; *Música paraguaya*, UT. Sun. & Mon. 0105-0255; presumably on 9735, 6025; times converted from local to UT -3 for winter starting in Oct. (via Tetsuya Hirahara, *Radio Nuevo Mundo*)

PERU R. La Voz de Alto Mayo, nominal 6130, is on 6137.4; info from listening to Hans Johnson's tape: morning program is *Junto a los Andes del Perú*, address is Av. Cajamarca, Carretera Marginal km 456, Nueva Cajamarca, Prov. de Rioja, Dpto. de San Martín. Is former R.

Colonial transmitter silent for nine years in same location (Takayuki Inoue N., *Relámpago DX* via *RNM*)

RUSSIA Mikhail Yelizarov, deputy Minister of Comms., suggests sharply reducing programs of R. Moscow International for abroad due to its problems in paying for services of his ministry. Kyrill Ignatyev, deputy chairman of Ostankino, sharply criticized MinCom for pursuing selfish economic interests, attempting to interfere in politics and art. Arman Oganesyan, chairman of RMI, says the station has changed entirely, propaganda replaced by objective info, heard by 100 megapersons worldwide (RMWS via BBCM) In a later appearance, Oganesyan promoted R. Moscow further; during the Gulf War, they were asked to broadcast American football scores to soldiers in Saudi Arabia who could not hear VOA. (BBCM)

Crisis Forces Radio, new station of Ministry of Defense weekdays 1600-1630 on 11835, 4940, 4740, discussing situation along the Tajik/Afghan border, jointly produced by RMI and Slavyanka, the radio studio of DefMin. Note that 4740 and 4940 once relayed R. Afghanistan from Tajikistan or elsewhere in USSR; now at 1700 (BBCM)

Rukhi Miras, not Meroc, address per QSL from Sheikh Ravil Gainutdin is Islamic Centre of Moscow Region, Moscow Jami Mosque, Vipolzov per. 7, Moscow 129090; sked still Fri. 1500-1545 on 4055, 7160, 11630, 12075, 17890 (Nikolai Rudnev, Russia, *OzDX*)

V. of the Assyrians, via R. Moscow, 1500-1530 Wed. & Sat., on 7305 in Assyrian and Russian; address Pyatnitskaya 25, 113326 Moscow (Grigoriev, BDXC) Also 12075, now 1600-1700 (BBCM)

Tu-Radio, 5905 at 1730 with traveling program, music and news (Grigory Grigoriev, BDXC and WDXC) Not to be confused with U Radio at same time on 5900!

R. Nadezhda/Hyvong, see last month, seems in Russian on Wed., Vietnamese other days (Tetsuya Kondo, RJ*MR*)

ST. HELENA R. Saint Helena Day 93 will take place on Oct. 15, on 11092.5 USB Fri. at 2000-2300 with a break at 2100, includes quiz with prizes of video of St. Helena, 1994 *WRTH*. Or first day covers: listen and send in answers postmarked not later than Dec. 1, for a drawing. In spite of poor reception, 1992 special got more than 1000 letters; please include return postage; and a T-shirt may be ordered for US$22. (John Ekwall, SATT, *SW Echo* via Thurman)

SA'UDI ARABIA [non] V. of the Free Men of the Peninsula from Riyad (Arabic: *Idha' at u sawti ahrari al-jazirah min al-Riyad*), believed to be from Iraq, hostile to Sa'udi government, is in Arabic at 2000-2200 and 2200-0000 on 9740 or alternate 11860; one hour later during winter time in Iraq (BBCM)

SLOVAKIA RSI programs: Mon., *Tourism, What's on Slovakia* [sic]. Tue., *Sports, Slovak Dailies*. Wed., *Political Perspectives, Economics/Ecology/Education*. Thu., *Dailies, Business Report*. Fri., *Cultural Happenings, Mixed Bag*. Sat., *Best of RSI*. Sun., *Special Features* (via Bill Westenhaver)

SOMALIA International Amateur Radio Network reports slightly different schedules for its Radio Free Somalia from week to week; one is 0400-0515 on 7460, 1600-1815 on 7490, in Somali exc. last 15 mins. in English; also set up ham station 6O0A. Location is Galcaio (John Norfolk, OK) That's quite a distance north of Mogadishu, near the inside bend of the "elbow" (gh) 100 watts with inverted V dipole 50 metres high, 1600-1815 on 7499 or 7475, 0400-0515 on 7460v, weak and fading but copyable (Victor Goonetilleke, Shri Lanka, RN*MN*) Report c/o Sam Voron, 2 Griffith Ave., Roseville NSW 2069, Australia (Christoph Ratzer, Austria via Büschel)

SOUTH AFRICA Channel Africa, English to 26 March: 0200-0400 9730; 0300-0500 5960; 0400-0500 9695; 0500-0600 11745; 0600-0700 17710; 1000-1100 17805; 1100-1200 9740; 1600-1800 4945, 15240 (via Westenhaver)

SPAIN SFR left a bad frequency, 9530, for a worse one, 9525, co-channel to R. Martí for English at 0000-0200; also interference at 0500-0600 (Diane Mauer, WI; Bob Thomas, CT; & gh) former Spanish colony Equatorial Guinea complained that REE's broadcast to that country was subversive; then it disappeared (*El País* via Mark Lodge, Barcelona) Z-93 sked had it at 1600-1700 on 17755.

TURKEY VOT should now be at 2300, 0400 on 9445; some features: Mon., *Magnificent Istanbul*. Tue., *Turkish Renaissance*. Wed., *Review of Foreign Media, Letter Box, Folklore*. Fri., *Colorful Land of Monuments, Shopping Centers and Covered Bazaars*. Sat., *From Seas to Mountains*. Sun., *History Stolen*. (via Diane Mauer)

UKOGBANI *BBC Worldwide* now has a US agent, $40 a year, can be charged via 1-800-BBC-4001 (Chet Copeland, DC) BBC programmes: *From Hoplite to Harrier: A Radio History of Warfare*, through Nov. 8, Suns. 0230, 1615, Mons. 0730. *Lighten Our Darkness*, all about the Sun, Sat. Sept. 25 at 1901, Mon. 0101, 1515. *The Water of Life*—whisky, Fri. Sept. 24 0730, 1215, 1930. *The Litmus Test*—science quiz through Nov. 3, Mons. 1715, Tues. 0030, Weds. 0830. *Live from the Archive*—BBC's extensive record collection dating back to 1888, through Nov. 9, Suns. 0415, Mons. 1930, Tues. 0915. *The Tunesmiths*—Hollywood musicals, through Nov. 3, Mons. 2215, Tues. 0630, Weds. 1615 (*BBC Worldwide's London Calling*) See also JAPAN

UKRAINE [non] Canada experimented with delayed relay of RUI 0300-0400 on 11900 in English, Ukrainian, hoping Kiev would relay RCI on MW (Bill Westenhaver, PQ, *W.O.R.*)

USA After losing hundreds of millions of dollars on TV and cable ventures, Christian Science Church announced its original SW station, WCSN in Maine, is for sale. Proceeds will go to install third transmitter and antennas at WSHB, South Carolina, in consolidation, cheaper than moving equipment from Maine. SW program is being cut to only one hour repeated, mostly drawn from *Monitoradio* on APR. WCSN will keep CS programs until WSHB-3 is ready, but these and KHBI Saipan will reduce overall airtime, and sell spare time to other broadcasters meeting CS standards (CSM press releases via David R. Alpert, Larry Nebron, George Thurman) Going rate is $1.50 per kilowatt hour, so 500 kW would run $750 per hour; clients could save by settling for only 100 or 250 kW (George Jacobs via George Thurman) CS didn't admit that it was bad idea to situate a SW outlet in Maine in the first place—anyone with minimal knowledge of propagation could have told them to go south, avoid the auroral zone, which will be even more of an obstacle during during the approaching solar minimum (gh)

Look for our *World of Radio* at additional times on WWCR-3; see last month's column and International Vacuum this month. WHRI resumed UT Sat. 0030 airing on 7315, bumped to 0130 when Croatians loquacious; WHRI times do not shift when DST ends but stay at same UT; WWCR times will be one hour later by UT and in some cases on different frequencies from Oct. 31. Listen to *W.O.R.* for news of a possible resumption of *DX Daily* or *DX Weekly*. WHRI's *DX Radio Show* shifted one hour earlier to 0200 UT Sun. on 7315 (gh)

Carl McIntire, 87, pioneer pirate broadcaster, was injured in a one-car accident in July; his *Twentieth Century Reformation Hour* is still on WINB, 15295, weekdays 1900 (exc. Nazi Tue.) with previous tapes (Charles Horowitz, OH, *W.O.R.*) For more on neo-Nazi movement check out new book *Denying the Holocaust*, by Deborah Lipstadt (NBC *Sunday Today*)

VENEZUELA Due to new network ownership, 6010 station is now R. Mundial Los Andes, from Mérida, heard at 1200 (Santiago San Gil, Venezuela)

VIETNAM VOV monitored program schedule, after *News* and *Commentary*: Mon., *Welcome to Vietnam, Vietnam's Personalities*. Tue., *Culture and Society*. Wed., *Letterbox*. Thu., *Vietnam's Economy, This Is Our Life*—cultural traditions. Fri., *Talk of the Week*. Sat., *Review of the Week's World Events, Music Program*. Sun., *The Sunday Show* (Edwin Southwell, WDXC *Contact*)

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

Broadcast Loggings

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

0225 UTC on 5025
CUBA: Radio Rebelde. Spanish. // 3365 kHz with fine signal. Latin/Cuban vocals. Plenty of Rebelde promos. (Don Taylor, Green Cove Springs, FL)

0123 UTC on 9700
GERMANY: Deutsche Welle. Discussion on economy problems. // programming on 6040, 6085, 6145 kHz. *European Journal* featuring the popularity of soccer in Europe. (Anthony Williams, Bangor, ME)

0142 UTC on 9570
PORTUGAL: Radio Portugal Int'l. Weather forecast to ID. // programming 9555, 11840 kHz. Chamber music to *Spotlight on Portugal* featuring a Nobel prize winner. (Walter Marksfield, Peoria, IL)

0146 UTC on 15155
ECUADOR: HCJB. Discussion on spiritual discipline. Instrumental music. ID at 0159 with frequency schedule. Time check to *Jonnie and Friends.* (Bill Newberry, Bakersfield, CA)

0203 UTC on 9505
USA: WYFR. Discussion on Genesis 4. Dr. Gene Scott audible on WWCR at 0207 on 5935 kHz. Rock music to 1-800 listener offer. Discussion on the Bermuda Triangle and the lost world of Atlantis. (Williams, ME)

0235 UTC on 3300
GUATEMALA: Radio Cultural. English devotionals, fair signal quality. Guatemala's Radio Chortis heard on 3380 kHz at 0312, amid high static. Radio Buenas Nuevas heard on 4799.8 kHz at 0342, very weak. (Taylor, FL)

0246 UTC on 3285
BRAZIL: Radio Sentinela da Amazonia. Portuguese. Very weak signal for male/female morning duo. ID and news briefs. (Taylor, FL)

0252 UTC on 3290
NAMIBIA: NBC. Afrikaans. Pop music vocals very weak to announcers English ID and talk at 0254. (Taylor, FL)

0338 UTC on 4755
BRAZIL: Radio Educacao Rural. Portuguese. Weak signal for morning show. Lots of news on Brazil to pop vocals. Time check noted, ID and local interest items. (Jerry Wilkins, Denver, CO)

0345 UTC on 4830
VENEZUELA: Radio Tachira. Spanish. DJ format to ID/frequency promo. Choral national anthem to patriotic song. Continued vocals and announcer talk. (Wilkins, CO)

0358 UTC on 4875
BRAZIL: Super Radio. Two easy-listening vocals to mentions of Roraima, Boa Vista, Brazil. "Super Radio" ID promo, QTH repeat and sign-off at 0400 minus national anthem. (Scott Martin, Cleveland, OH)

0416 UTC on 4990.7
PERU: Radio Ancash. Spanish. Nice rustic Peruvian vocals. Time check at 0420, to local news talk. Peru's Radio Chota heard on 4890 kHz at 0250. IDs and music fair signal. (Martin, OH)

0434 UTC on 5035
CENTRAL AFRICAN REPUBLIC: Radio Centrafricaine. French vocals at tune-in, to French announcements. News items on the U.S., with world news updates. Fair signal. (Martin, OH)

0630 UTC on 7385
PIRATE: Vietnam Veteran's Radio. Good reception for programming mix of protest and anti-war tunes. U.S. national anthem played on electric guitar and other Vietnam war comments. Station may originate from Los Angeles, as the announcer spoke against the LA mayor. One clear ID. (Robert Pietraszek, Turners Falls, MA)

0835 UTC on 6060
ARGENTINA: Radio Nacional. Good signal for Argentine tunes. Several time checks and news briefs. Still audible at 1005, same frequency. (John T. Roberson, San Antonio, TX)

0845 UTC on 4895
COLOMBIA: La Voz del Rio Arauca. Spanish. Latin ballads and pop vocals. Musical jingles and local talk. Colombia's La Voz del Cinaruco audible on 4865 kHz at 0855 and 0353. Latin ballads and Caracol network promo. (Sam Wright, Biloxi, MS)

0904 UTC on 4885
BRAZIL: Radio Clube do Para. Portuguese. Sambas at tune-in. Station ID, DJ with listener phone-in. AM rooster sound effects at regular time checks. Music jingles to pop vocals. Station audible the next night at 0403. Brazil's Radio Tropical audible on 4855 kHz at 0020. (Wright, MS)

0920 UTC on 3375
BRAZIL: Radio Nacional Sao Gabriel da Cachoeira. Portuguese. Nice signal for jingles and Portuguese pops. Plenty of "Nacional" IDs. Morning regional news to time check. National news topics to musical promos, monitored to 1100 newscast. (GVH)

0945 UTC on 11835.5
URUGUAY: Radio El Espectador. Spanish. Station ID and location. Ad for Banco de Montevideo to news obituaries. (Rausch, NJ)

1045 UTC on 11835
SRI LANKA: Music to world newscast. ID noted as, "This is the external service of the Sri Lanka Broadcasting Corporation. Don't hear this station everyday. (Tom Banks, Dallas, TX)

1050 UTC 4975.5
COLOMBIA: Ondas del Orteguaza. Spanish. Latin vocals. Station ID/frequency and mention of Florencia. Time check to talk and pop vocals. (Banks, TX)

1058 UTC on 6070
CANADA: CFRX. Morning news and sports roundup. Promo for Ontario DX club, ID and time check at the hour. News from Ontario, Toronto, and U.S. travel agency ad to traffic update and weather forecast. (Frank Hillton, Charleston, SC)

1107 UTC on 6080
AUSTRALIA: Radio Australia. Asian news topics from Japan and China. Aussie national news, // 9580 much better. World news on Thailand, Mozambique and PNG. // 5995 at 1125 with program line-up to Aussie country and western music. (Hillton, SC)

1115 UTC on 6576
NORTH KOREA: Radio Pyongyang. Tentative ID on this station. Asian dialect with ID type format. Asian classical music with // 7576 kHz. (Hillton, SC)

1214 UTC on 15210
CHINA: China Radio Int'l. *Listener's Letterbox* show on exotic Chinese foods. (Bob Fraser, Cohasset, MA)

1225 UTC on 12070
AUSTRALIA: AAF Radio. Fair signal for Aussie Forces Radio. Pop music tunes by DJ to 1300 sign-off. (Banks, TX) Station still verifies with 2 IRCs, veri signer Hugh MacKenzie.

1524 UTC on 13635
SWITZERLAND: Swiss Radio Int'l. *Future Watch* show with discussion on Swiss railway system. Gershwin piano instrumentals. Frequency quote, ID into French service at 1530.(Hillton, SC)

1535 UTC on 13720
GUAM: AWR. Tentative ID for very weak signal. Additional religious programming monitored as; 15105 kHz at 1547 on WHRI; 15355 kHz at 1603 on WYFR; 15375 kHz at 1605 KCBI. (Joel Alexander, Clearwater, FL)

1715 UTC on 15070
UNITED KINGDOM: BBC. Sherlock Holmes, *The Second Stain.* 2215 UTC on 9915 kHz, *Seeing Stars* on globular star clusters. (Fraser, MA)

1825 UTC on 13620
KUWAIT: Radio Kuwait. Easy listening Arabic vocals. ID/frequency schedule at 1829. Time tips at 1830 to fanfare music. World newscast to 1840. Program feature on Kuwait's Iraqi invasion, *A Day of Shame.* Pop tunes program to 1900. (GVH)

1915 UTC on 17575
ISRAEL: Kol Israel. *Calling All Listeners* feature on the Song of the Jewish Ghetto Resistance Fighters. (Fraser, MA)

1935 UTC on 17605
NETHERLANDS ANTILLES. Radio Netherlands Relay Station. *Happy Station* show on the 18th North Sea Jazz Festival. (Fraser, MA)

2215 UTC on 15220
MOLDAVA: Radio Moldava Int'l. Romanian. Male/female interview format. Instrumental folk music to 2230. ID at 2230. Musical bridge to more chat and instrumentals. Weak signal lost at 2258 by co-channel sign-on. (Hillton, SC)

2215 UTC on 11620
INDIA: All India Radio. *Radio Newsreel* roundup, and upcoming program schedules. ID at 2229. (Steve Goldman, Roselle, IL)

2225 UTC on 15674.6
HONDURAS: Radio Copan Int'l. Spanish. Latin instrumentals to English IDs. Local chat to time check. QSL address given as: Box 955, Tegucigalpa, Honduras or Box 526852, Miami, FL 33152. Hope this one QSLs. (Jonathan Campbell, Riviera Beach, FL)

2230 UTC on 11885
UNITED ARAB EMIRATES: Radio Abu Dhabi. Pop rock on domestic Capitol Radio, with upbeat DJ format. SW External Service in English with *Letterbox* program on Fridays to 2320. Nice on parallel 15305 kHz. (Goldman, IL)

2232 UTC on 11805
RUSSIA: Radio Moscow Int'l. *Audio Book Club.* 1410 broadcast heard on 17760 kHz with news and views. (Fraser, MA)

2235 UTC on 9520
GERMANY: Radio Liberty. Russian. European service heard on parallels 9725, 9625, 7220, 5995. Male/female conversation. Phone-in chats to clarinet instrumentals by Kenny G. Covered at 2259 by Radio Exterior Espana. Station relogged 2305 on 11885 kHz in Russian. News heard on parallels 9750, 9520, 7220. Will try to QSL. (Thomas S. Barnes, Marietta, GA) *Anyone else need an address? Radio Free Europe/Radio Liberty, Oettingerstrasse 67, 80538 Munich, Germany. (GVH)*

Utility World

Larry Van Horn
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Aero RTTY

One of the more popular areas for radio enthusiasts to monitor in the HF spectrum is the aeronautical band. Listening in on USB voice communications between ground stations and aircraft becomes pretty commonplace for those who tune in on aero action.

Another aspect of aero listening, however, involves the Aeronautical Fixed Service (AFS). This service links specific points via the digital modes. The primary purpose of this service is for safe air navigation and for the routine, efficient and economical operation of air services.

These circuits employ the entire spectrum of available communication methods, including HF radio, landline, microwave, submarine cable and satellites. Transmission modes include RTTY and various other transmission protocols.

There are two distinct types of aeronautical RTTY: semi-continuous coded weather signals covering wide geographical areas, and uncoded occasional traffic relating to aircraft movements and weather reports. The two traffic types are seldom transmitted from the station. Table 1 is comprised of stations of the second type, broadcasting information about aircraft movements and weather.

The African Continent is dotted with these stations which come alive at night, when most of the long haul overflights occur. Most of these stations are located in the former French Colonies and they communicate with each other in networks which fall under the titles of ASECNA ("Agence pour la Securite de la Navigation Aerienne en Afrique et a Madagascar") or AFTN ("Aeronautical Fixed Telecommunication Network"). Modes used are baudot RTTY, ARQ-M2 and ARQ-E3, the latter being a French military code. Table 1 is a sampling of active stations from Robert Hall's 1992/1993 database and intercepts from the utility world logging column.

Most messages encountered on these networks are in coded format and are usually decoded by computers at the receiving end. An excellent publication, the *Air and Meteo Code Manual* by Klingenfuss, will provide the monitor with the means to decode traffic heard in the AFS service. Another source of information on these networks is the *Aeronautical Communications Handbook, HF Edition* by *MT's* Robert Evans. Both of these references are available through several *MT* advertisers.

Thanks to Robert Hall in South Africa for his input in preparing this segment on the AFS networks.

Stettin Radio Frequencies

In a recent report from the UK, Robin Hood reports the following information on Stettin Marine Radio, Poland.

SITOR Frequencies

Call	Transmit	Receive	Schedule (UTC)
SPB28	2829.5	2529.5	24 Hours
SPB43	8650.0	8404.5	2130-0530
SPB62	12597.0	12494.5	24 Hours
SPB83	16914.0	16787.5	0530-2130
SPB93	22505.0	22352.5	0530-2130

Stettin Radio sends SITOR-B traffic lists at 0200, 0600, 1000, 1400, 1800, and 2200 UTC. The broadcasts at 1000 and 2200 include a traffic list for Gyndia (SPH) Radio, also in Poland. Stettin also has a blind transmit service on request at 0800 and 1600. Robin also notes that Stettin has been testing in USB on 1794.0 kHz using the call sign SPO.

MAS Update

Mr. C. Brown, a radio operator aboard the *SS Guadalupe*, has passed on some new information on the Medical Advisory System in which provides medical care by radio. A quick phone call to Owings confirmed the information that Mr. Brown sent in to the column.

This information updates the information presented in the July 93 column regarding MAS.

WHD576 MAS - Medical Advisory Systems - Owings, MD

Frequency (kHz)	MAS Channel	Antenna
2182.0	1	Vertical
4983.0	2	Vertical
6227.0	3	Vertical
7952.0	4	Rotating
8294.0	5	Rotating
12356.0	6	Rotating
16531.0	7	Rotating
22165.0	8	Rotating

All frequencies except 12356.0 are continuously scanned. 12356.0 is monitored continuously. All transmission are in USB. Thanks to Mr. C. Brown for this valuable update on an interesting service to monitor.

Offutt Radio Sites Visited

Regular Ute World reporter, Richard Baker, recently drove out to Offutt AFB, NE, to catch an airshow and open house. Here is his report.

"We got to Offutt in time for Zommie 42 (a Schweizer TG-7A training powered-glider from the Air Force Academy), to land for the show. Also present was Quail 80, a T-1A Jayhawk specialized pilot trainer, 64th Flying Training Wing (FTW) at Reese AFB, TX; a Dragon or Hawk, callsign B-1B from Dyess AFB, TX; a Cujo or Risky, callsign B-52G from the 34th Bomber Squadron (BS); and Blue Angel 01 through 09. The 09 is the C-130 support aircraft. There were, of course, many others. Many of these callsigns are heard on the Global High Frequency System (GHFS) frequencies, Offutt being one of the GHFS stations."

Rick's adventure didn't stop on the base. The next day he drove out to the various Offutt annex communications centers located in the area. Here is that report.

"First stop was Elkhorn, NE, location of annex 2, the transmit site for Offutt GHFS. The antennas, about three conical and six other LPH-89's, were all surrounded by cornfields.

Next was Scribner, NE, where a sign directed us to Scribner Air Base. Well, Scribner Air Base was an abandoned air field for the most part, but sure enough, we found the Offutt GHFS receive site. There was only one conical and two of the LPH-89 antennas at this site. After leaving Scribner, I failed in an attempt to find Annex 3, listed in the book *Nuclear Battlefields* as located in Hooper, NE."

On the third day, Richard's adventure continued as he sought out one additional Offutt site. Richard narrates this interesting find. "...the VLF transmitter site at Silver Creek, NE, was located. Built in the 1950's, this was the SAC (Strategic Air Command) airborne command post ground entry point or GEP, where they are capable of beaming a multiplexed (MUX) wide-band FM signal used for communications links with the autovon/DSN military telephone networks."

"The VLF (Very Low Frequency) system is used to maintain communications between the bombers, missile sites and other US Strategic Command (USSTRATCOM) assets. This was a large single tower with a large insulator at the base, with a tunneled entrance visible below it. The tower supported what looked like strings on insulated wire

Table 1: Aeronautical Fixed Service Loggings

Call	Station/Location	Mode (Speed/Shift)	Frequencies
--	Larnaca Air, Cyprus	RTTY (50/399)	8137.0
3BZ	Plaisance Air, Mauritius	ARQ-E3 (48/850) (some RTTY)	4023.5 7763.5 9195.0 9378.5
3XA	Conakry Air, Guinea	RTTY (50/360)	3710.8 7610.0 10104.0
5AF	Tripoli Air, Libya	RTTY (50)	2822.0 11494.5 18388.6 19822.5
5HD	Dar-es-Salaam Air, Tanzania	RTTY (50/828)	7990.0 11175.8
5NK	Kano Air, Kenya	RTTY (50)	11440.0
5ST	Antananarivo, Madagascar (ASECNA)	ARQ-E3 (48/425)	4014.7 9194.9
5TX	Nouadhibou, Mauritania (ASECNA)	ARQ-E3 (48/415)	6943.0
5UA	Niamey, Nigeria (ASECNA)	RTTY (50/419)	5160.5 7596.0 7614.0
5YD	Nairobi, Kenya (AFTN)	RTTY (50/302)	7423.0 8165.0 11546.0 12256.0 13366.5 13372.5 13737.0
6VY	Dakar, Senegal (ASECNA)	RTTY (50)	6975.0 9070.0 10407.0
7OC	Khormaksar Air, Yemen	RTTY	5879.0 6765.7 11005.0 11541.0 14395.0
8BN	Medan Air, Indonesia	RTTY	6925.0
8Q9	Maldeve Air, Maldives	RTTY (50/215)	6989.0
9GC	Accra, Ghana	RTTY (50/434)	5804.0 5904.1 7832.0
9HA	Luqa, Malta (LMML)	RTTY (50/425)	2682.0 3595.0 5364.0 5818.5 7797.0 9228.0
9JZ	Lusaka Air, Zambia	RTTY (50/339)	7913.0 8118.5 11443.0
AWC	Calcutta Air, India	RTTY	3177.5
AWD	Delhi Air, India	RTTY	8071.3
CSY	Santa Maria Air, Azores	RTTY (50/666)	5474.0 9994.2 10539.1 12323.0 14497.5
D4B	Sal Island, Cape Verde Islands	RTTY	9154.0 14508.0
EIP	Shannon Air, Ireland	RTTY	8145.0 11440.0
EPD	Tehran Air, Iran	RTTY (50)	5107.0 12065.0
ETD3	Addis Ababa, Ethiopia	RTTY (50)	6736.0 6912.0 9873.5 10779.0 18924.8
FBSK	Gaborone, Botswana	RTTY (50/434)	5287.2
HSD	Bangkok Air, Thailand	RTTY (50)	3886.2 4014.0 10654.3 13742.5
HZJ	Jeddah Air, Saudi Arabia	RTTY (50)	5733.0
STK	Khartoum Air, Sudan	RTTY (50)	3602.5 11507.5 11634.5 13991.5 13996.5 16202.0 18064.5 18173.5 18543.5
SUC	Cairo Air, Egypt	RTTY (50)	10633.0 14498.0
S2D	Dhaka Air, Bangladesh	RTTY (50)	6882.5 10613.0 15655.0
TJK	Doula, Cameroon (ASECNA)	ARQ-E3 (48/850) ARQ-M2 RTTY (50/780)	4056.0 7714.0 4788.0 9136.0 9226.0
TLO	Bangui, Central Africa Rep(ASECNA)	(75/881) RTTY	6902.5 9072.5
TNL	Brazzaville, Congo (ASECNA)	RTTY (50/405) ARQ-M2 (Ch B)	4487.5 10123.0 14462.5 3898.0 8123.0 9285.0 14890.0 14989.0
TRK	Libreville, Gabon (ASECNA)	ARQ-E3 (48/380) ARQ-M2 (96/452)	4464.5 6941.3
TTL	N'Djamena, Chad (ASECNA)	ARQ-M2 (96/450) RTTY	9217.5 18047.0
TUH	Abidjan, Cote d'Ivoire (ASECNA)	RTTY (50/436)	4195.5 5848.0 7690.0 9423.0 9846.0 11486.0
TYE	Cotonou, Benin (ASECNA)	ARQ-M2 (96/425)	5117.5 7524.0
TZH	Bamako, Mali (ASECNA)	RTTY (50/425)	735503 7626.0 10134.0 11515.2
XTU	Ouagadougou, Burkina Faso	ARQ-M2	6775.0
XZW	Yangon Air, Myanmar	RTTY (50)	4015.0 7419.0
YAV	Kabul Air, Afganhistan	RTTY (50)	5266.0 11065.0

Table 2: New Coast Guard Cutters, Island Class

USCGC Key Biscayne (WPB-1339)	PO Box 2647, Corpus Christi, TX	78403-2647
USCGC Jefferson Island (WPB-1340)	259 High Street, S Portland, ME	04106-0007
USCGC Kodiak Island (WPB-1341)	c/o CG Station, Panama City, FL	32409-5898
USCGC Long Island (WPB-1342)	100 Lighthouse Ave,Monterey, CA	93940-1497
USCGC Bainbridge Island (WPB-1343)	c/o CG Group Sandy Hook, Sandy Hook, NJ	07732-4999
USCGC Block Island (WPB-1344)	c/o CG Base, PO Box 237, Atlantic Beach, NC	28512-0237
USCGC Staten Island (WPB-1345)	c/o Support Center, 4640 Urquhart St , New Orleans, LA	70117-4698
USCGC Roanoke Island (WPB-1346)	PO Box 2208, Homer, AK	99603-2203
USCGC (WPB-1347) (Nothing shown)	But as Pea Island has been heard, I strongly suspect it is the 1347. *(Interesting Rick - I have nothing in my official Coast Guard list for a 1347-Larry)*	
USCGC Knight Island (WPB-1348)	RR2 Box 995, Freeport, TX	77541-8934
USCGC Galveston Island (WPB-1349)	PSC 455 Box 176, FPO AP	96540-1056
USCGC Point Baker (WPB-82342)	PO Box 488, Sabine Pass, TX 77655-0488	
USCGC Mariposa (WLB-397)	c/o CG Support Center, 1519 Alaskan Way South, Seattle, WA 98134-1192	

antenna on the upper third, or half.

"There were also several VLF loops visible, probably used to receive GWEN (Ground Wave Emergency Network) VLF signals. Also, a lone HF conical antenna could be seen, and what may have been a UHF wide band MUX antenna on the tower.

"With SAC gone, the sign at the gate identified the facility as '1 ACCOOMG, USAF.' This site sends out USSTRATCOM coded data on 58.5 kHz. It's also in the middle of a cornfield, quite a ways back from the public road we made sure to stay on, due to the other signs.

"What kind of signs could so easily prevent a diehard UTE such as myself from digging deeper? How about, 'Use of Deadly Force Authorized'!—a lot more stern than the typical 'subject to search' signs seen at the other sites!"

Coast Guard Cutter Update

Richard Baker also sent along the following Coast Guard Cutter update for Coasty listeners. Table 2 lists the names, hull numbers, and addresses for the new USCG Island-class cutters. No callsign info yet.

As of this time all of the Cape-class WPB's have been decommissioned. A couple of new CGC addresses:

Finally: Rick has a couple of new frequencies for the US Coast Guard in Operation Able Manner (Haiti). 7626.0 kHz seems to be primary, with 5223.0 kHz stated as secondary, but nothing has been heard there as of yet. Both frequencies use USB mode. The tactical channel ID for 7626.0 is 3 Echo 10 (3E10), while 5223.0 kHz is 3 Echo 5 (3E5).

A big Ute World thank you to Rick and all our contributors this month for your input. As most of you know, this month we make our annual journey to the *MT* Convention, this year at the Atlanta Airport Hilton. I give several forums of interest to Ute monitors including a special meeting on Saturday for informal discussion of utilities in general.

If you haven't signed up yet, it's time to get on the stick and make plans to attend right now. This year promises to be the biggest and best yet. I will be dragging my scanners to hear activity at Atlanta Hartsfield Airport, as listening should be excellent, and I hope to see each of you at the convention. Now it's time for a B&J and a look at what you have been hearing this month in the utility world.

Utility World

Utility Loggings

Abbreviations used in this column

AF	Air Force
AFB	Air Force Base
AM	Amplitude Modulation
AN	Argentine Navy
ARQ	Automatic Repetition on Request (SITOR-A)
ARQ-E	Single Channel Simplex ARQ
ARQ-M2	Multiplex ARQ teleprinter system with two data channels
ASECNA	Agence pour la Securite de la Navigation Aerienne en Afrique et a Madagascar
ATC	Air Traffic Control
BA	British Army
Canforce	Canadian Forces
CAMSPAC	Communications Area Master Station, Pacific
CG	Coast Guard
CIS	Commonwealth of Independent States
Comms	Communications
Comsta	Communications Station
CW	Continuous Wave (Morse Code)
DF	Direction Finding
DUP-ARQ	Hungarian Diplomatic simplex ARQ teleprinter system
Fax	Facsimile
FACSFAC	USN Fleet Area Control & Surveillance Facility
FF	French Forces
FHWA	Federal Highway Administration
FM	From
FN	French Navy
HFDL	High Frequency Data Link
ID	Identification
IRNA	Islamic Republic News Agency
LSB	Lower Sideband
MARS	Military Affiliate Radio System
Meteo	Meteorological
MFA	Ministry of Foreign Affairs
m/v	Motor Vessel
NORAD	North American Aerospace Defense Command
Ops	Operations
QRM	Interference
RAF	Royal Air Force
R/T	Radiotelephone
RTTY	Radioteletype
SAM	Special Air Mission
SAN	South African Navy
SELCAL	Selective Calling
SITOR-A	Simplex Telex over Radio, Mode A
SITOR-B	Simplex Telex over Radio, Mode B
UHF	Ultra High Frequency
UN	United Nations
Unid	Unidentified
USACOE	United States Army Corps of Engineers
USAF	United States Air Force
USB	Upper Sideband
USCG	United States Coast Guard
USCGC	United States Coast Guard Cutter
USN	United States Navy
USS	United States Ship
Vacapes	Virginia Capes
VFT	Voice Frequency Telegraphy
XINHUA	New China News Agency

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

518.0 ZSC-Capetown Radio, South Africa, with a NAVTEX test transmission using SITOR-B at 0700. (Robert Hall-Capetown, South Africa)

1794.0 SPO-Stettin Radio, Poland, with English language test transmission in USB at 2200. (Robin Hood-UK)

2180.0 English female 5-digit number station in AM at 0400. (Barry Williams-Enterprise, AL)

3467.0 Air India 356 working Bombay ATC in USB at 2157. (Robin Hood-UK)

4125.0 WHW730-Limited Coastal Station (New) Larose, LA, working several m/v's with call and LaRose Base IDs in USB at 1325 (Cajun Accent). (Neal Perdue-Madison, AL)

4134.0 NPSE-USS Philippine Sea (CG-58) working NMN-USCG Comsta Portsmouth, VA, for RTTY frequencies in use using USB at 0534. (Baker-OH)

4372.0 Giant Killer FACSFAC Vacapes working G5M relaying comms for 7XV giving UHF frequencies (Note possible new frequency, no longer 4373.0). Heard in USB at 0037. (Baker-OH)

4373.0 Giant Killer working U6E and S4I (USN Fleet Area Control Vacapes) in USB. (Frank Carson-Clinton, MD)

4560.0 CFH-Halifax military, Canada, working unid Canforce ship advised ship to change frequency to A5B in USB at 0712. (Baker-OH)

4707.0 RAF Buchan, Scotland, calling Echo 6 Foxtrot with intercept co-ordinates in USB at 1727.

4737.0 Two male fisherman with usual XXX language in USB at 0545. (Scott Burke-Tuscon, AZ)

4991.7 RFFVAY-FF Sarajevo, Bosnia Hercegovina, with ARQ-M2 message to RFFP [FKWA] at 0604. (Joerg Klingenfuss-Germany)

5000.0 YHF-Israeli Mossad number station mixing with WWV at 0145 in AM. (Bill Fernandez-MA)

5203.5 Delta 28 working Romeo 41 in USB at 0553. (Burke-AZ)

5230.0 MIW2-Israeli Mossad number station in AM at 0117. (Fernandez-MA)

5400.0 WNFT417-Bell Telephone, Morristown, NJ, testing radio with IBM-1. Latter said would return, was going to other frequencies to make checks with other stations. Heard 1546 in USB. This is USACOE channel 8. (Baker-OH)

5610.0 Portishead Radio, England, working Aer Lingus "Shamrock 4953" for phone patch in USB at 2204. (Robin Hood-UK)

6224.0 Herb working Lady Elise giving weather info for sea area in USB.(Carson-MD) WHV-926 Limited Coastal Venice, LA, working *m/v Miss Robbie* in USB at 1456. (Perdue-AL)

6227.0 Ship *Catalina 2* working J8GX9 regarding fuel quality and contracts in USB. (Carson-MD) WQZ484-Limited Coastal Larose, LA, working unid m/v. Gave call and 'Larose Base' ID in USB at 1520. (Perdue-AL)

6420.0 UON-Baku Radio, Azerbaijan, with traffic list in CW at 1800. (Robin Hood-UK)

6696.0 Halifax Military, Canada, preparing to send weather info to EK7M in USB. (Carson-MD)

6715.0 CAMSPAC San Francisco, CA, coordinating a USAF/CG rescue unit being dispatched to *m/v Suda* for crewman injured in a fall from a 8 meter ladder in USB at 2245. (Jeffery Jones-Tracy, CA)

6716.0 Vancouver Military, BC, Canada, working McKenzee regarding DFing of emergency transponder on 2182.0. In USB at 0135. (Jones-CA)

6735.0 Deerhunter calling Guardian then went green at 0800 in USB. (Burke-AZ) Fox Tango net, Fox Tango working Lima, Juliet and Oscar attempted to set up playground on Delta 20 (unknown frequency), no joy. Heard at 0414 in USB. (Baker-OH)

6790.0 Malibu station with duplex phone patch in USB at 0450. (Jones-CA) *Andrews has been here before-Larry.*

6812.0 Spar 64 working Andrews (F-888) with phone patch. Checked F-640 (13878.0) secondary in USB at 0115. (Jones-CA)

6815.5 Y9L with green comms to unid station in USB at 0425. (Jones-CA)

6840.0 Spanish female 4-digit number station in AM at 0237. (Williams-AL)

6875.0 Grizzly Bear calling Smokey, Black, Brown, Polar, Panda Bears for radio checks in USB at 1540. Brown and Grizzly went to Alpha 6 but no contact made. Brown asked what type of camouflage is it and reply was shade type only. (Burke-AZ) *Either Marines or Army-Larry.*

7536.5 Alpha Charlie 5 calling AC4, no joy. Monitored this net several months, may be U.S. Army or USAV's as they tend to shorten AAC calls to AC. Heard 1813 in USB. (Baker-CA)

7626.0 At 0645, Ghost 92 calling *USCGC Dependable*, no joy. This is the new primary for USCG ops Able Manner (Haiti Ops) with 5223.0 secondary. All in USB. (Baker-OH)

7784.0 Bravo Whiskey/Uniform and other stations using abbreviated call signs and talking about radar tracking of aircraft and ships during an exercise in USB at 1850. (Fernandez-MA)

7959.1 9BC23-IRNA Tehran, Iran, with 50 baud RTTY English news bulletin at 1903. (Hall-RSA)

8048.5 Star Force Operations working Aircraft 118 diagnosing VCR problem in USB at 0405. (Jones-CA)

8050.0 Sambrook with data for McClellan AFB in USB at 0054. (Jones-CA)

8056.0 Spanish female 5-digit number station in AM at 0400. (Jones-CA)

8081.0 Grapevine calling unid station passing voice and RTTY traffic in USB at 2127. (Burke-AZ)

8122.0 Royal Australian Navy units passing traffic in USB at 0700. (Burke-AZ)

8135.0 Spanish female 5/2-digit number station in AM at 0519. (Williams-AL)

8240.0 *NAFO-USCGC Cowslip* working NMG-Comsta New Orleans, LA, asked if they had integrated HFDL yet, NMG advised did not, had no idea when that unit would have same. In USB at 0131. (Baker-OH) *Sounds like a new USCG HF data System is in operation-Larry.*

8294.0 KPN-Limited Coastal Houma, LA, working *m/v H.O.S. Iron Lee* (odd name) in USB at 1346. WQB853-Greenville, MS, working *m/v Mary Ann* in USB at 1450. (Perdue-AL)

8297.0 WJD-Limited Coastal Tampa, FL, working *m/v Delta Billie* in USB at 1210. (Perdue-AL)

8303.5 LOR-AN Puerto Belgrano, Argentina, with 75 baud RTTY navigational warnings at 0524. (Klingenfuss-Germany)

8312.0 German female 3/2-digit number station simulcast on 10135.0 at 0221 in AM. (Fernandez-MA)

8427.5 SPA41-Gdynia Radio, Poland, with SITOR-B traffic list at 1850. (Hall-RSA)

8740.0 OXZ-Lyngby Radio, Denmark, with voice marker in USB at 0106. (Baker-OH)

8743.0 HEB-Berne Radio, Switzerland, working *m/v Meltonia Brussels* for

R/T traffic in English in USB at 0529. (Baker-OH)

8746.0 EHY-Madrid Radio, Spain, with start of USB traffic list in USB at 0153. (Baker-OH)

8749.0 LFL-Rogaland Radio, Norway, with weather in USB at 2323. (Baker-OH)

8791.0 LFL-Rogaland Radio, Norway, working unid vessel (EFFY) in USB at 0515. (Baker-OH)

8889.0 Fisherman discussing fishing in the dark in USB at 0600. (Burke-AZ)

8903.0 Springbok 201 working Accra ATC in USB at 2227. (Robin Hood-UK)

8972.0 Spangle 713 calling Spangle 711. Spangle 713 working Bluestar in USB at 2030. (Harry Riddell-Rochester, NY)

9023.0 Oakey Sam (Tinker AFB) working Northern Lights regarding mission Bandsaw India. Northern Lights working Bandsaw India. Bandsaw India calling Huntress and working Backburner. Moved to 326.4 for RATEL? coordination but Bandsaw India stated all UHF assigned to weapons training. Mention of 251.8 format training at 1600. Mention of 282.5. Bandsaw India assigned Northeast Air Defense Center. Apparently went to satellite in USB at 1330. Dragnet Tango calling Air Alpha, Crisco. Dragnet Uniform working Yaeger, Edmonton military. Told Edmonton was sector 2 and orbiting. Edmonton military relaying between Dragnet Uniform and Yaeger. Oakey Sam and Dragnet Tango changed frequency to 302.4. Format training cancelled due to lack of UHF on Yaeger's part. In USB at 2050. (Riddell-NY) *NORAD channel-Larry.*

9043.5 Elvis working Grayteam, Greenteam and Razorback in USB at 1945.(Riddell-NY)

9135.7 TTL-ASECNA N'Djamena, Chad, with positive ID using 48 baud and a strange shift of 192 Hz at 1724. (Hall-RSA)

9190.1 Acquire working Acrobat, changed frequency to Mike 3 and mentioned Mike 4 in LSB at 1800. (Riddell-NY)

9220.0 Less Filling working Taste Great (No really, Larry, not kidding!). One was located on the beach and stated "Personnel female name was lying on the beach nude and sunbathing." Stated it was a real tough job making sure the radios worked okay! (Riddell-NY) *I bet it was tough, wish I knew which service, I would go to the nearest recruiter-Larry.*

10066.0 Speedbird 12 working Calcutta ATC in USB at 1811. (Robin Hood-UK)

10215.0 Riverboat working Barsmith sending 5 pieces of written traffic in USB at 2310. Mentioned 5 Bravo conducted sonarbuoy drop earlier in week and Charlie completely monthly Charlie by spot check. (Fred Lehman-Greenville, OH)

10766.0 Fisherman talking the usual stuff in LSB at 0249. (Bob Pettengill-Blanchard, OK)

10841.4 FF Djibouti with ARQ-M2 idling at 1940. (Hall-RSA)

10960.7 RFFP-FF Paris, France, with ARQ-M2 200 baud channel A traffic and messages to RFFVAY during local daytime [FDXA]. (Klingenfuss-Germany)

11176.0 Hilda working WSAP and ADNG in USB. (Carson-MD)

11182.0 DHJ59 calling RJN in USB at 1938. (Riddell-NY)

11191.0 Demon 37 working Gonzo 06B with immediate coded message in USB at 1925. (Riddell-NY)

11209.0 Andrews AFB in comms with SAM 681, 683 and 973 in USB on F-034. Checked 13412.0 (F-202) secondary at 2335 in USB. (Jones-CA)

11214.0 Yaeger calling Dragnet in USB at 2005. (Riddell-NY)

11217.0 AF155 calling LTKO 2047. German AF155 calling LTKO in USB at 2022. (Riddell-NY)

11220.0 Gamble 02 working aircraft with transponder problems in USB at 2015. (Riddell-NY)

11345.0 Scandinavian 932 working Stockholm Radio for phone patch to Norway (and asking for soccer result) in USB at 0741. (Robin Hood-UK)

11455.0 VLM-Casey Meteo, Antarctica, with Fax charts. (Klingenfuss-Germany)

11485.0 English female 5-digit number station in AM at 0815. (Jones-CA)

11488.0 SAM 86972 on F-123 working Andrews AFB with signal check. Andrews had poor copy and told them to go to F-768 (13205.0) in USB at 1500. (Jones-CA)

11634.0 On F-237 from 6812.0 SAM 682 working Crown checking satellite comm link in USB at 0122. (Jones-CA)

12115.0 GXQ-BA London with VFT, test tapes on several channels at 1940. (Hall-RSA)

12140.4 HWN-FN Paris-Houilles, France, with RTTY RY/ID test tape at 200 baud. (Hall-RSA)

12155.0 Spanish female 4-digit number station in AM at 0320. (Williams-AL)

12158.0 WWJ40 working WWJ82 on guard (Channel F-6) with a quarterly exercise check-in. Also heard WTB2 and WGY912 checking in (FHWA net) using USB at 1920. (Burke-AZ)

12170.2 RNR4-Magadan, Russia, CIS, Meteo with fair Fax weather chart at 1638. (Hall-RSA)

12228.6 BZR62-XIHNUA Beijing, China, with RTTY English news bulletins at 1630. (Hall-RSA)

13155.0 R9I with numbers and letters broadcast in USB at 0221. (Bob Valen-Lumberton, Texas) Several Navy ships with radio checks only in USB at 1722. (Burke-AZ) *Bob, as evidenced by Scott's logs this is a US Navy channel. Welcome to Ute World loggings-Larry.*

13205.0 On F-768, SPAR 66 working Andrews AFB with phone patch to Stuttgart (Army Base) in USB at 2345. Radio operator on SPAR 66 had some difficulty getting his message across to the Army personnel. After patch was terminated he told the Andrews radio operator, "Boy, they're being all that they can be." (Jones-CA)

13207.0 Air Force Auckland using SELCAL tones to call, then briefly worked flight 336. (Jeff Haverlah, Humble, TX)

13212.0 Aircraft 6667 on test flight north of Puerto Rico in comms with ground station 6666. Also had a data link set-up in USB at 0140. (Jones-CA) Kimble 66 periodically working Kimble 67 with 67 out over the Caribbean approximately 20.48N 66.19W heading 210 degrees at 158 knots. (Haverlah-TX)

13412.0 Andrews AFB in comms with SAM 683, 049 and 27000. Heavy QRM so they went to F-202 (13565.0, not confirmed F-529) in USB at 0310. Also KC-01 working Andrews with phone patch in USB at 1910. (Jones-CA)

13878.0 On F-640, SAM 26000 working Andrews with phone patch in USB at 0705. (Jones-CA)

14606.0 USAF MARS Sandman 01 working AFA28Z in USB at 2225. Sand man 01 was an aircraft flying over Saudi Arabia and the other station ran phone patches for him. (Lehman-OH)

14642.0 UN traffic (messages from New York & Rome) to Khartoum in SITOR-A at 0948. (Robin Hood-UK)

15048.0 Bangor 66 working Lovejoy, Sanctum mentioned threats and SA6 active at coded location. Bangor working Rammer, Recall, Worship for ground attack exercise. (Riddell-NY)

16620.0 UNQI-*m/v Volga*4005 working Portishead Radio in CW at 0905 (ship carrying coal from Riga to Barry, Wales). (Robin Hood-UK)

16803.0 YLFR-*m/v Milgravis* working UQK Riga Radio in 50 baud RTTY at 1539. (Robin Hood-UK)

16828.0 HEC37-Unid station with CW beacon at 0012. (Ecuador?) (Pettengill-OK) *Nope Bob, it is Berne Radio, Switzerland-Larry.*

16839.0 PCH66-Schevenigen Radio, Netherlands, with CW beacon at 0002.(Pettengill-OK)

18035.4 ZRH-SAN Capetown, South Africa, with foxes test tape using 75 baud RTTY at 1207. (Hall-RSA)

18041.1 HGX21-MFA Budapest, Hungary, to Hungarian Embassies with Hungarian/French news using 50 baud RTTY (not DUP-ARQ). (Hall-RSA)

18173.0 CW 5-figure number station at 1225, ended with a series of V's at 1234. (Gerry Watt-Elmsdale, NS Canada)

18393.0 On F-531, Andrews AFB working SAM 971 from 11226.0 (F-141) checking radios in USB at 0625. (Jones-CA)

19011.8 PCW1-Hague Radio, Netherlands, with news in Dutch using SITOR-A at 1314. (Hall-RSA)

19236.1 RFFXS-FM Detalat Onvsom with ARQ-E traffic in French for RFFEBU and REGHLICO Pau at 1550. (Hall-RSA)

19256.8 FM Boustane Paris to Khargia Cairo, First time using SITOR-B at 1158. (Hall-RSA)

22380.1 PCH75-Scheveningen Radio, Netherlands, with SITOR-A traffic and CW/ID at 1240. (Hall-RSA)

22394.1 OXC-Lyngby Radio, Denmark, with CW ID at 1252. (Hall-RSA)

22401.1 HEC62-Berne Radio with CW ID at 1302. (Hall-RSA)

22876.0 Italian Embassy, Tel Aviv, with 5 letter groups message to MFA Rome using 96 baud ARQ-E at 1244. (Robin Hood-UK)

29454.0 RS-12 Amateur Satellite (Robot) answering my CQ on 21130.0 using CW at 0200. (Watt-NS)

22458.0 WNU36-Slidell Radio, LA, with CW CQ marker at 1825. (Gordon Levine-Anaheim, CA)

22463.0 JCU-Chosi Radio, Japan, with CW CQ marker at 0004. (Levine-CA)

22479.0 9VG27-Singapore Radio, Singapore, with CW CQ marker at 1637. (Levine-CA)

22577.0 KPH-San Francisco Radio, CA, working various ships in CW at 2350. (Levine-CA)

22582.0 KFS-San Francisco Radio, CA, with CQ CW marker at 2033. (Levine-CA)

22603.0 PPR-Rio de Janeiro Radio, Brazil, with V CW marker at 2029. (Levine-CA)

22670.0 PPR-Rio de Janeiro Radio, Brazil, with V CW marker at 2025. JCS-Choshi Radio with CQ CW marker at 2132. (Levine-CA)

22694.0 XSG-Shanghai Radio with CQ CW marker at 2334. (Levine-CA)

The Scanning Report

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

Scanning the Mounties

In 1873 they were known as the Northwest Mounted Police. Their mission was to bring law and order to the Canadian Northwest Territories. They patrolled on horseback, wore red uniforms, and established police posts to protect rural settlements. In 1885 they helped to suppress the Indian rebellion that threatened the building of the Canadian Pacific Railway. By 1920, they had become known as the Royal Canadian Mounted Police (RCMP), and they assumed responsibility for policing all of Canada. After moving their headquarters to Ottawa, they were affectionately nicknamed, "The Mounties."

In the years that followed, the Mounties earned their reputation for persistence and bravery. I'm sure you've heard the motto: "The Mounties always get their man."

In today's world, the RCMP is Canada's federal police force. Officers in the RCMP are usually seen in blue uniforms with gold trim. The familiar scarlet dress uniforms of the RCMP are reserved for special occasions and duty assignments.

The duties of the RCMP parallel those of the FBI in the United States. The RCMP investigates criminal activities, enforces Canadian federal laws, protects dignitaries, operates crime and fingerprint labs and controls firearm registration. They work closely with U.S. agencies and have access to criminal information contained in FBI and INTERPOL files.

The RCMP differs from the FBI in that it has responsibility for municipal police functions in areas that do not have provincial police. In the Yukon, for example, the RCMP has been the only police force since 1873.

The RCMP has more than 21,000 individuals divided into 13 divisions. The divisions include 52 subdivisions and 723 detachments. The mounties, however, are not limited to Canada. The RCMP has 19 satellite offices located around the world.

In addition to the RCMP, there is another federal agency in Canada. "The Royal Newfoundland Constabulary" was established before Newfoundland became part of Canada. Following the guidelines of the British police system, the Constabulary is the only police force in Canada that is unarmed.

Radio communications within the RCMP are controlled by VHF and UHF repeaters. It is important to note that the repeaters can be linked together to form a nationwide communications system. The main repeater frequencies are:

Eric Walton

421.3375 Special investigations	422.0875 Royalty security
421.4375 Diplomat security	422.7125 Surveillance
421.5375 Interprovincial	422.7250 Helicopter Transport
421.5625 Diplomat security	423.0875 Royalty Security

Royal Newfoundland Constabulary
153.890 153.950 154.010 154.040 154.190 154.250 154.620

In addition to the above frequencies, the RCMP utilizes a variety of VHF/UHF frequencies that can change with each province. Fortunately, there has been a gradual increase in published directories. For example, readers are advised to consult the *British Columbia Frequency List (BCF)*. Published by J&M Communications, the BCF has a laminated cover, is spiral bound, and features more than 150 pages of frequencies. The book is divided into three sections: basic scanning information; services and frequencies listed by location; and locations and services listed by frequency.

Suggested retail price is $18.95 from J & M Communications, 3149 Beverly Crescent, North Vancouver BC V7R 2W4, (604) 984-7076. Readers living within monitoring range of Alberta, Canada, will also be interested in J&M's *Alberta Frequency List*. The Alberta book is also laminated and spiral bound, with more than 150 pages of frequencies that are entirely devoted to Alberta.

Since their inception in 1873, the duties and responsibilities of the Mounties have remained virtually unchanged. Their loyalty, bravery and devotion continue to bring law and order to Canada's cities and wilderness. To join the adventure, all you need is a scanner radio. If you're not within monitoring distance, don't get discouraged. There's plenty of time to plan next year's vacation! I'm sure Ron Tull would love to greet another *MT* subscriber in Whitehorse, Yukon!

Treasure Hunt

This is your last chance to win more than six pounds of military air frequencies. The *Directory of North American Military Aviation Communications*, is published by Hunterdon Aero Publishers. The expanded second edition contains a glossary of abbreviations and military terms and is published in four regional editions: Northeastern, Southeastern, Central and Western.

The lucky winner of our Treasure Hunt will receive all four editions. Here are the clues.

1. Provide a popular space shuttle frequency.
2. Military control towers operate on 236.600 MHz. True or False?
3. Air Force One has been monitored on 4__.700. (Fill in the blanks.)
4. Name the town and state featured on the front cover of the July 93 issue of *MT*.
5. Explain the abbreviation, "GPS."

If you're not chosen as our lucky winner, the guides can be purchased from Hunterdon Aero Publishers, P.O. Box 754 Flemington, NJ 08822 (1-908-806-7134) or through Grove Enterprises. The retail price is $24.95 per edition.

Frequency Exchange

Our first stop is ***Toronto, Canada***. As you pull your neck into your warm coat, check out the frequencies that were sent in by Jeffrey Johnston.

Toronto Police	Ontario Police
139.740	139.53
155.895	139.545
142.035	139.65
142.065	139.68
142.125	139.77
142.155	139.80
142.305	140.04
142.335	140.115
142.695	140.13
142.875	141.795
142.905	141.84
142.965	141.885
142.995	141.90
411.8875 Toronto jail	149.695
412.2125 Investigations	149.83
412.8875 Investigations	149.86
862.4125 Headquarters/maintenance	
862.5125 Cadets	

Ministry of Health Ambulance

149.170	Ontario	149.335	Ontario	149.44	Ontario
149.47	Ontario	165.71	Toronto	414.2625	Ontario

As we depart Canada, don't forget to bring your coat. The early morning and evening hours in ***Greensburg, Pennsylvania,*** can be quite cool. This area is home to Bob Landis and here are his favorite State Police frequencies.

159.045 Repeater out
159.075 Repeater out
156.195 Repeater in--from Ohio line to 100 mile marker
156.225 Repeater in--from the 100 to 200 mile marker

Bob says that all transmissions are relayed back to the Harrisburg headquarters via a 2 or 6 gigahertz microwave link.

Since we're already in Pennsylvania, let's stop and visit with Bob Ferguson. Bob wants to share the frequencies that he monitors during the ***Penn State football games.***

Post game interviews	Parabolic Mikes	Traffic Parking/Police
161.640	809.587	464.05
161.70	810.187	
450.012	813.487	
450.80	822.525	

Our last Pennsylvania invitation came from an anonymous contributor. Here is a list of frequencies for ***Lancaster, Pennsylvania.***

33.56	Lancaster fire	158.73	Epharta Police
33.90	Lancaster dispatch	158.79	Epharta Police
75.94	Columbia Police	159.15	Epharta Police
154.875	Lancaster Police	155.28	Lancaster Hospital
155.475	Epharta Police	158.73	Columbia Police
155.535	Epharta Police	158.79	Columbia Police
156.03	Lancaster Prison		

Another anonymous contributor who wishes to be called, "The Scan Man," has invited us to ***Morristown, Tennessee.***

42.42	Highway patrol	153.80	Morristown Fire
46.06	Hamblen Fire	155.025	Morristown EMS dispatch
46.50	Hamblen Fire	155.205	Morristown EMS ambulance
47.80	Appalachian Electric	460.275	Hamblen County Sheriff
153.47	Morristown Power	460.40	Hamblen County Sheriff

460.725 Sammons Cable TV
463.30 College Square Mall Security
463.50 Three Rivers ambulance
463.95 Checker Cab

Are you tired of carrying that winter coat? "No problem," says Steve Cook, "you can leave it at my house." Welcome to the warm and sunny locale of ***League City, Texas.***

48.30	Texas-New Mexico power & light
154.175	Fire Dept.
453.625	League City ambulance
461.4875	Bay Brook Mall Security
461.75	Best Waste Trash Co.
464.225	Gulf Greyhound Park security
464.6875	Alameda Mall Security
464.9125	Mall of the Mainland Security

Our next invitation is from ***Aberdeen, Maryland.*** If you left your coat at Steve's house, it may be possible to borrow a blanket or sweater from Joe Montana. Here are Joe's favorite frequencies.

37.30	Police	460.55	Midland Park Police
37.18	Police	156.21	Annapolis Police
453.80	Police	159.21	Annapolis Police
458.80	Police	453.975	Baltimore City wide Police
33.88	Fire	458.425	Baltimore Police
33.60	Fire	495.1875	Baltimore Police
155.115	Road maintenance	495.1875	Baltimore Parks
451.825	Midland Park Police	151.04	Aberdeen State Police—JFK highway

Your favorite hometown frequencies are important to us. Send your frequency lists to the Frequency Exchange, P.O. Box 98, Brasstown, NC, 28902.

Automotive Batteries

In the July column, I stated that "hydrochloric" gas was produced during the charging process of lead-acid batteries. Several sharp eyed readers pointed out that hydrochloric gas was not explosive. "The real danger from lead-acid batteries," wrote Henry Gates of Salt Lake City, "is the hydrogen gas that is produced during the charging cycle." Gates is a chemist and he explained that hydrogen, when mixed with air, becomes an explosive gas.

Since I'm not a chemist, I won't argue over the type of gasses that are produced. It's more important to remember that lead/acid batteries are dangerous. Don't use them indoors!

Back to Crystals

Utility companies have discovered that a portable, synthesized two way radio draws 20 to 50 times the current that a crystal-controlled radio (CCR) does. A CCR will operate for a week on one charge, but synthesized radios rarely last more than 5 hours.

It was also discovered that CCR's can be operated near energized power lines. Synthesized radios, on the other hand, were rendered useless when repair crews attempted to use them on the job site. The conclusion: don't discount the crystal-controlled radio as out-of-date. Especially for utility companies or operating in crisis situations in which batteries cannot be recharged, the CCR still comes out on top.

Texas Trunking

The city of Richardson, Texas, has installed a trunked radio system. According to Wah Kit Loh, the old police frequencies, 453.475, 453.675, and 453.775 are not utilized. The new 800 megahertz frequencies are: 867.200, 867.225, 867.275, 867.300, 867.325, 867.350, 867.375, 866.150, 866.175, 866.650, 866.675, 867.150, 867.650, 868.275, 868.300.

The 2.9 million dollar radio upgrade allows Richardson's police and fire departments to be in continuous radio contact during emergencies. To discourage third party monitoring, each transmission is accompanied by a burst of tones lasting several seconds. The tones prevent scanner radios from following the action. To hear the full conversation, listeners must manually step their scanner radios to the next available frequency.

To receive Loh's detailed report of Richardson's trunked system, send a #10 SASE to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

More Caller ID

Your letters are testimony to the fact that protecting caller identification on the telephone is a hot topic. In our high tech society, it is becoming nearly impossible to place an anonymous telephone call. Calls to a 911 emergency number, for example, usually display the caller's phone number and address. And in some areas, consumers can purchase electronic boxes that display the phone number of the calling party.

As I mentioned in July's column, protecting your telephone privacy is possible, but it isn't free. The pay service called "Stopper" charges $1.95 per minute to protect the caller's identification to any location in the United States. For more information, call toll free 1-800-235-1414.

Wet and Wild

Handheld scanner radios are popular items. Everyone seems to have a scanner radio hanging from their belt or stuffed into a pocket. As the popularity of hand held radios continues to soar, accidents are bound to happen.

Dry land accidents are usually not fatal to the radio. A cracked case or bent antenna can be repaired or replaced. But what about water damage? Would you know the procedures to follow if your hand held was dropped into a lake?

According to Motorola technicians, a fresh water dip isn't that serious. The solid state technology used in today's radios can usually recover from a quick dip. The radios are disassembled, liberally sprayed with a chemical that displaces water, and carefully dried with compressed air. In most instances, the only component requiring replacement will be the speaker.

Dropping your scanner radio into salt water is probably the worse scenario—especially if the power switch was on. The salt water shorts everything out, making repairs costly.

If your scanner radio goes for a salt water swim with the switch off, all may not be lost. Remove the battery pack and flush the radio with fresh water for approximately five minutes or more. Since the radio was already submerged, don't worry about making things worse. The water damage was already done.

If you're in a boat and can't get to running fresh water, soak the radio in whatever fresh water is available for approximately 15 minutes. Remove the radio from the water, and take it to the nearest repair shop.

Okay, I know that some of you won't agree. I'm not really sure if I could force myself to "soak" my handheld for 15 minutes! But the above recommendations came from reliable technicians with more than 15 years experience.

What do you guys think? Has anyone dropped their handheld scanner into the drink? If so, what did you do? Send your comments to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

Scanner Stories

One of the greatest story tellers in Abington, Massachusetts, has retired. Fran Johnson was known for his animated story telling style and intricate details. During a social gathering, scanner buffs from neighboring towns told Johnson that his nightly stories on the police radio would be missed.

Johnson's radio popularity soared when he became a police dispatcher and began to share his experiences over the air. "Stop at Kal's and bring back a coffee, no sugar." Johnson would say. When the patrolling officer radioed back that he couldn't find Kal's, Johnson replied. "That was just a touch of nostalgia for you young guys. Kal's was burned down years ago."

Johnson joined the police department in 1964. He worked cruiser duty for five years, served eleven years as a plain clothes officer and, in 1979, became the night shift dispatcher. (News clipping from the *Patriot Ledger*.)

Scanner Tip Off

When the video store in Pleasantville, New Jersey, was robbed, the police had little hope of apprehending the suspect. After taking an undetermined amount of cash, the suspect simply walked out the door and disappeared into the crowded streets.

Hearing the suspect's description on a scanner radio, a local citizen spotted the individual and called police. A few minutes later, the suspect was apprehended without incident. (News clipping from *The Press*.)

Next Month

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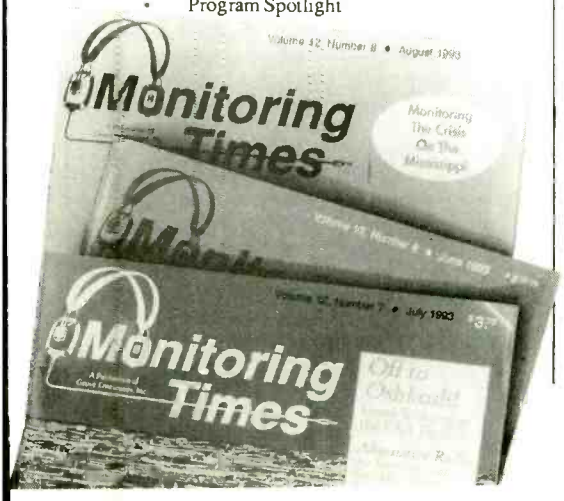

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GEnie T.AREY1

First Contact

A few days ago I ran across a friend I had not seen in awhile. About three months prior he had successfully passed his Amateur Radio "No-Code" Technicians Class license test. I asked him how he was enjoying his new hobby. He told me that he had purchased a good used handi- talkie at a recent hamfest and that he even put an antenna on his car for the commute to work.

Knowing he had a choice of half a dozen repeaters in the area, I was quite puzzled that I had not heard him on the air, even though he had both license and equipment for quite a while. I then invited him to meet me on a particular frequency so we could "chew the rag" on the way to work in the morning. He sort of looked past me for a few seconds and mumbled that "He hasn't been on the air yet." He was just too shy and scared to pick up the mike and operate.

It seems that there are two kinds of people who get their ham licenses: Folks who get on the air as soon as they open that envelope from the FCC, and those who literally agonize for days, weeks, even months before they join the ranks of active hams. Old Uncle Skip has a few notions to help folks overcome the nervousness of that first time on the radio. Welcome to . . .

UNCLE SKIP'S GUIDE TO FIRST CONTACTS

Be it CW, voice, or any other mode you may be licensed to try, we all get the jitters when we start out. Heck I've been a ham for years and I still got butterflies in my stomach the first time I keyed up my packet radio station. This was in spite of the fact that the ham I was contacting was somebody I had talked to hundreds of times on 2 Meter FM and HF SSB. Since I only use CW once in a blue moon, I shake so much when I start out I end up sending a long string of dots.

Because I have always had my share of the operating shivers, I have made use of a few techniques to get me over the hump and into the fun.

Listen in on the Fun

Since you are reading *Monitoring Times*, it is reasonable to assume that you have already been bitten by the radio bug. Shifting from simply monitoring to amateur radio operating is a fairly common occurrence. Lots of folks get the urge to put their own signals out there in the ether. But long before you ever start studying for your first ham ticket, you can begin to eavesdrop on amateur activity. "Ya don't need no license to listen, Bunky!" Start tuning around the ham bands to get an idea of how people operate.

On HF most of the activity will be in SSB and CW modes. Try tuning through 1800-2000, 3500-4000, 7000-7300, 10100-10150, 14000-14350, 21000-21450, 24890-24990, 28000-29700 kHz. If you have a VHF/UHF scanner you will hear a great deal of mostly FM activity through 144-148, 220-225, 420-450, 902-928, 1240-1300 MHz. If your scanner covers the lower bands, you will also hear folks having fun in the 50-54 MHz segment known as the 6 meter band. Hams have access to frequencies well up through the microwave regions, but most of this activity can't be monitored with receivers you are likely to already have at your listening post.

Take some notes on what you hear. Pay close attention to the protocols and courtesies common to the hobby. Notice how people initiate contact with one another. You will notice many people calling CQ. CQ is a way of letting people know you're on the air and you want to talk to anybody who can hear your signal. Answering a CQ call is a great way to make your first contact. In the VHF/UHF FM world, folks don't usually call CQ. Instead you might hear someone say their call sign followed by the word "listening" (e.g.. "WB2GHA listening"). This is someone who is just letting folks know that he or she is available to communicate, usually through a local repeater system.

Regardless of where you listen within the ham bands, you will discover something that should ease your mind and reduce those First Contact Jitters. The ham bands are by and large populated by thousands of folks who are just like you and who are looking forward to talking to you on the air! All those folks calling CQ or "listening" would be honored to be your first contact in the amateur radio world.

Your monitoring will give you a good idea of standard operating practices, such as how and when to give your callsign. (Hint: You have to ID at the beginning and end of your contact, and at least every 10 minutes in between) You will also learn the informal practices and politeness that goes along with typical ham communication. No doubt, you will also run across a few "bad examples" of people tuning up on the air or calling on a frequency without first checking to see if it is clear. When you hear these poor practices it is also likely that you will find other hams reminding the offender of the error. Amateur Radio has a long and proud history of self policing.

This brings us to another important point. When your license comes and you first get on the air, everybody makes mistakes. Beginners often make a few more mistakes. If something goes wrong and somebody tells you about it, thank them for the correction and don't get upset by it. Also don't be afraid to let people know you are just starting out. Most hams are more than willing to go out of their way to help you learn and become a better operator.

Your listening in on the ham radio world will show you that some of the operating practices

Carole J. Perry, WB2MGP, noted author and promoter of amateur radio, has been featured in QST and will be the guest speaker at the Monitoring Times Convention banquet.

change slightly with each band or mode. This is not as confusing as it sounds and your monitoring has probably clued you in to the slight variations. One of the best ways to get a handle on good and proper amateur procedure is to get a copy of *The ARRL Operating Manual* (4th Edition) $18.00 available through many of the radio hobby booksellers found in the pages of *MT* or directly from The American Radio Relay League (225 Main Street, Newington, CT 06111). This reference work will show you how to go about properly making contacts using each of the available amateur bands and modes. This book will also teach you the common abbreviations and jargon used in the hobby.

Don't Wait for the Ink to Fade

As I said earlier, some folks don't wait for the ink to dry on their licenses before getting on the air. Now that you know that folks really want to talk to you, just pick up the mike or key and do it! Still scared? No problem, Compadre. Why not do like all great public speakers do and write yourself a script?

Using the information gleaned from your monitoring, along with what you can find out from operating manuals and ham radio friends, write out what you plan to say on the air. Even go so far as to write down your own callsign, name and location. You are going to be nervous enough to forget your own name. I've done it myself, folks! Make up a few simple scripts and put them on 3x5 cards at your operating location. After that first contact or two, you will find you won't need them very often. Just don't let the ink fade on the 3x5 cards before you make your first contact.

Hangin' with Elmer

The study guides that are currently available for the "No-Code" Technicians Class license are so comprehensive that most folks can simply study the book for a few weeks and head off to take the test. This will get you your license, but it does not do much to get you on the air. The key to starting out in the ham radio hobby is people power. Check with your local electronic supply stores, public libraries and newspapers. Find out where the nearest Amateur Radio Club is and start attending meetings, even if you are not yet licensed. Just let folks know you want to become a ham and you will be made most welcome. Many clubs even offer formal license training classes on a regular basis.

Once you get there, find yourself an ELMER. Helping someone join the ranks of Hamdom is known as being an "Elmer." A good Elmer will help you get your mind right for the license exams. He or she will also be more than willing to help you make that first contact when the time comes. This is how I helped my abovementioned friend get over the fear of his first contact. I invited him over to my station.

First, I got on the air and made contact with another ham, letting him know I was going to turn the mike over to a newly licensed operator. After this successful QSO, I helped my friend make a few contacts on his own. The ice was broken and he got into the swing of things. Needless to say, Old Uncle Skip has been called Old Uncle Elmer more than once. You will find most hams like that name almost as much as their own.

Don't Fall Off Your Log

Back in the good old days, FCC regulations required that amateur radio operators keep detailed logs of their contacts. Changes in the rules have relaxed this requirement, but it still is a good idea to keep a detailed log, especially as you are just beginning your amateur radio career. A log will help you get to know the names and callsigns of the hams you communicate with. More importantly, a log will give you a place to track your progress and maybe note a few things you have to remember.

For example, if you start out using the 2 meter repeater frequencies in your area, you will need to keep track of the receiver frequency as well as the transmitting frequency (usually offset + or - 600 kHz from the receiver). A few notes in the margins of your contact log about control settings will go a long way in helping you get used to your equipment. Since keeping a log is an integral part of the radio monitoring hobby, you should have no trouble maintaining the habit when you enter the ham ranks.

In addition to your log book, you will want to keep a pencil and paper handy during your operating. This is essential for most beginning (and even many expert) CW operators. Copying code "in your head" is a gift I have never mastered. Voice operators will also want to jot down a few notes to keep track of who they are talking to and what they are talking about. In the midst of tending to your radios and your operating practices and procedures, it is easy to forget the flow of the conversation.

Everybody's Got to Start Someplace

A journey of a thousand miles begins with the first step. A ham contact of five thousand miles can begin with the press of a button. As stressful and confusing as your first few contacts may be, you will look back on them with great joy throughout your amateur radio career. See you on the bands, folks. Have fun being a ham!

MT

Steve Douglass

In the Line of Fire

Can you imagine a career where the job requirements demand that you be willing to sacrifice your life for your boss? Next time you are on the job, look at the man that signs your paycheck. Is he (she) worth dying for? Would you give up your existence for him? Chances are you probably would not, unless you work for the Secret Service.

The Secret Service recently garnered a lot of attention in Hollywood's *In The Line of Fire*. Clint Eastwood stars as an aging, burnt-out Secret Service agent (who was present at the Kennedy assassination) battling an ex-CIA assassin wacko bent on killing the President. It is an exciting tale of intrigue, espionage and edge-of-the-seat excitement: first class Hollywood-style entertainment.

But the Secret Service is tasked with more than presidential protection. They are also part of the Treasury Department which investigates all counterfeiting, forgery, credit card fraud and other crimes that threaten the nation's treasury, and it is one of Uncle Sam's premier law enforcement agencies.

In fact, there are many top federal agencies that fall under the Treasury Department's control. Other government agencies taking their cues from the Treasury Dept. are the *Bureau of Alcohol, Tobacco & Firearms, US Customs Service, White House Communications Agency, Internal Revenue Service, Bureau of the Mint, Bureau of Engraving and Printing* and the *Federal Law Enforcement and Training Center.*

So let's put ourselves *in the line of fire* (only figuratively) and check out the frequencies of the Treasury Department.

Department of the U.S. Treasury

Freq MHz	Description
166.4625	Treasury common
165.205	Treasury tactical
165.215	Treasury tactical
165.4875	
166.200	
166.4375	
166.625	
166.875	
169.550	
407.7875	Treasury Command Posts

Bureau of Alcohol, Tobacco and Firearms (BATF)

Description	Freq MHz
Tactical Ch-1	165.2875
Operations Ch-2	166.5375
Primary Tactical Ch-3	165.2875 (paired with 166.5375)
Treasury Common Ch-4	166.4625
Tactical CH-5	165.9125
Tactical CH-6	173.8875
Tactical Ch-8	168.000
Investigators/Bomb Squads	173.8875 (paired with 166.5375)

Mystic Star VIP Communications

Note that all communications are in USB mode and use is subject to change periodically

Freq MHz	Channel	Designation
6.683	F-118	Primary voice: Special Air Missions (SAM) (also Executive One Foxtrot)
6.716	F-090/989	
6.756	F-151/30	Andrews AFB/AF-1/AF-2 secondary
6.812	F-888	AF-I/AF-2 primary voice check-in
6.817	F-064	
6.830	F-259	
6.989	F-775	
9.006	F-426	
9.043	F-358	
11.226	F-141/335	
11.156	F-387	
11.634	F-237	
13.201	F-669	Andrews AFB, AF-I/SAMs
13.205	F-768	Andrews AFB
13.823	F-377	

Mark Swarbrick

White House Communications Agency/Secret Service (WHCA/SS)

Channel	Freq.	Description
Baker	167.7875	Escort President guard
Charlie	165.3750	Lesser person guard
Delta	169.925	Exec branch messenger service
Echo	407.850	**Air Force 1 air/ground telephone
Foxtrot	415.700	**Air Force 1 (paired with echo)
Golf	166.400	Input to Repeater Charlie
Hotel	166.213	
India	407.925	U.S. Treasury Guard Service
Kilo1	67.825	Duplex Mobile Phone-Pres. residence
Mike	165.213	Car to Car and some field offices repeaters
November	165.025	Press Business Freq-Backup staff
Oscar	164.8875	Pres. Garage and Secondary CP
Papa	164.400	Technical Security and Input to Baker
Quebec	166.700	Motorcade-Car to Car
Tango	165.650	Point to Point Tactical
Uniform	361.600	Air Force 1 Communications
Victor	164.100	White House Comm. Agency
X-ray	166.4625	Treasury Common
Yankee	162.6875	High Band Phone Patch-Paired w/Zulu
Zulu	171.2875	High Band Phone Patch-Paired w/Yankee
	415.450	Air Force 1
	406.000	Air Force 1
	305.000	Air Force 1 & 2 UHF satellite link (WBFM)

***Note:** Since the Clinton administration took office there has been extensive use of DVP scrambling (called Royal Crown) on all Treasury Department channels. Little if any scrambling has been heard on HF Mystic Star frequencies, and phone patches can still be heard in the clear.

****The White House Communications Agency maintains a nationwide network (called NATIONWIDE) of UHF repeaters for Air Force One communications located at AT&T microwave antenna sites. Any of the repeaters can be activated by telephone lines which automatically patch through Air Force One and Two radio communications. Not all the repeater sites are known, but some of them are as follows:

Amarillo, TX	Norway, IL
Clines Corners, NM	Portage La Prairie, MB
Cheyenne Mtn., CO	Roscommon, MI
Ennis, TX	Regina, SK Canada
Fairview, KS	Sherbrooke, ON Canada
Glendive, MT	Socorro, NM
Helena, MT	Smith Falls, ON Canada
Hillsboro, MO	Sudbury, ON Canada
Lamar, CO	Terre Haute, IN
Lyons, NE	Wheatland, ND
Mounds, OK	Wyoming, MN

Federal Law Enforcement Training Center, Brunswick Naval Air Station, GA

Description	Freq MHz
Criminal Investigator Training	173.125, 171.500, 173.875, 170.825
Tactical	415.300 (TAC-1), 417.200 (TAC-2), 419.175 (TAC-3)
Security	170.975
Maintenance	170.100
Surveillance	169.550, 169.600, 170.000, 170.325
Driver Training	169.550, 169.600, 170.000, 170.325, 170.600, 173.025, 173.075, 173.125

MAILBAG

Presidential Five-O Visit

Speaking of Secret Service communications, Fred from Honolulu writes us with no joy concerning President Clinton's recent trip to Hawaii. Fred says, "I was extremely disappointed (from a monitoring point of view) with President Clinton's recent visit to Honolulu. With the exception of a few cryptic and far between identifications, I was unable to copy any transmissions from the Secret Service, White House staff, military escorts or Air Force One.

"Using Federal File articles of April 1992 and November 1992 as my data base, I entered the frequencies into my 2006. It would appear that the Secret Service has gone almost entirely to scrambled transmissions for presidential visits. I assume that the frequent short static bursts were indicative of digital scrambling. Generally, the only clear transmissions were on 165.785 MHz and they consisted of one-way calls to or from McGuire Base, Portland Base, Honolulu Base or McKinnan Base.

"At my location approximately 15 miles from Hickam Air Force Base there was absolutely no traffic from Air Force One on the much touted 'Echo/Foxtrot' or 'Yankee Zulu' frequencies."

Many monitors thought that with a new president and a young staff, Air Force One communications would be conducted sloppily until the rookies got the hang of things. However, this has proven not to be the case (with one notable exception reported in September's "Communications" column). It seems that new communications security procedures have been initiated on the UHF and VHF frequencies used by Air Force One/Two and the Secret Service, including extensive use of DVP voice scrambling. Some communications are still being made in the clear (especially on HF) but the majority of VHF and UHF communications are scrambled.

From The Bridge (Port)

Robert Thomas writes us from Bridgeport, CT, where the military monitoring is first rate. Here are Robert's loggings:

Freq MHz	Description
138.000,138.600	F-15s in Warning Zones LJ/NJ
138.300,138.875	(all AM)
317.950	ACC AWACS exercises
311.000	ACC Command Posts
327.600	Refueling Ops
319.400	Refueling Ops
226.200	"Moose flight" with B-52s from Loring AFB
364.200	ANG & AWACS
312.800	"COSMIC" flights (F-16s and "Huntress")
138.875	Interplane
228.700	"TORCH" flight (*anyone know who this is?*)
238.700	F-15s practicing Zone 105
226.200	"RIPPER" (F-14s) interplane

Kelley's Way

Military monitors and stealth chasers are well aware of the contributions to aviation by Lockheed. The super-fast (but recently retired) SR-71 Blackbird and the radar-invisible F-117A are only a couple of recent examples of Lockheed's genius. Both of the aforementioned aircraft were the brainchildren of the *Skunkworks*, Lockheed's think tank that also developed the U-2/TR1 and possibly the super-secret "Aurora Project" aircraft.

This year Lockheed is celebrating the 50th anniversary of the Skunkworks and especially its founder, Clarence "Kelley" Johnson's contributions. To commemorate the anniversary, Lockheed has released a video, *"Kelley's Way,"* profiling the history of the Skunkworks. What is particularly interesting to military buffs is the previously unseen classified footage of the development of the SR-71 and U-2 spyplanes. Much of the footage takes place at the super-secret Groom Lake test facilities and has never been seen by the general public. Also included on the video is exclusive footage of the launching of two D-21 drones from the back of an SR-71. The video is a fascinating inside look into the "black" projects world.

The video can be had at a great price of $5.99 (plus $5.00 shipping and handling) from the Lockheed Employees' Recreation Club Store (LERC), 1011 Lockheed Way, Palmdale, CA. 93599-3720. FAX: (805)572-2747, phone: (805)572-2213. You'll also receive a great catalog filled with everything to please your average aviation buff's heart.

MT

The Pilot's Perspective

Welcome aboard! Where did the summer go? I hope that everyone had a great season. Now we have the Convention to look forward to; I hope as many of you as possible can come—it will be a special treat for aero monitors!

Today, we'll hear from Doug Bauder, an MD-80 Captain for a major airline, aircraft photographer, **and** *MT* subscriber, who will tell us about some of his experiences, especially those related to aviation comms. The floor's all yours, Doug:

Most of my travels involve flying through hubs. The one I am most familiar with is DFW (Dallas-Fort Worth). The airline flies several "complexes" each day, mostly flowing from east to west or vice versa. There are probably 40 planes in each "complex," including many commuter planes. Approximately 75 percent of these flights are running east-west and the other 25 percent are running north-south.

Each of these flights is "metered" into the airport, as it can only accept a certain number of flights per hour. In good weather, this is no factor, although one can expect some speed changes or vectors in order to attain a 10-mile spacing between airliners arriving at the hub. This spacing is gradually reduced to three miles once the aircraft are on final approach. For example, in our airline's first complete west-to-east complex of the day, about 40 aircraft leave the west (7am departures from Seattle to San Diego, slightly later departures from Phoenix, Tucson, Denver, etc.) all are scheduled to arrive at DFW within 30 minutes of each other, not counting the aforementioned commuter flights.

There is obviously some congestion when approaching the two west VORs in the DFW area. The problem is resolved while over west Texas, using speed changes or vectors in order to get everyone into an orderly flow into the terminal area. If instrument approaches are required at DFW, more spacing is required and some holding can be anticipated.

This flow that I have tried to describe occurs many times a day at any hub that you can mention. The flow from Denver, O'Hare, Dallas/Fort Worth, Memphis, St. Louis, Detroit, etc., seems to be mostly east-west, whereas hubs in Nashville, Raleigh-Durham, and Washington, D.C. (Dulles) run north-south.

The controllers that work our busiest terminals are very professional and you had best "listen up" when approaching these places lest you miss something. Each hub experiences much momentary pressure on air traffic control in their respective hubs as well as on gift shops, restrooms, etc." *(You can say **that** again! jb)* It's a relief to get into a relatively less busy Center area such as Salt Lake City!

Harry Baughn

This pilot shares experiences with our special guest, Doug Bander.

International Flights

In a comparison between our U.S. controllers and their counterparts in Europe, I can say there is much more coordination needed between countries. You can think of each country as its own "Center". Perhaps the new EEC will help, but it will take quite some time, I think. At any rate, Spanish controllers seem to be the most casual, with the French being in the middle and the Germans and English being the most precise.

I'll relate a radio experience that I had over the Atlantic last year. I was First Officer on a 767on a night flight from Miami to Madrid. At that point, as you know, all our position info is done on the HF frequencies, leaving our 2 VHF radios for other things. One of the VHF radios is always tuned to 121.5 (VHF Emergency) and the other is tuned to 131.8, which is the pilot-to-pilot frequency used between aircraft over the Atlantic.

We were about 500 miles west of Lajes, Azores, when there was a call from a Cessna aircraft on 131.8, asking if anyone heard them. We did and responded. The Cessna pilot and his companion were in a C152 on their way from St. Johns, Newfoundland, to Lajes, ferrying the plane on to Europe. They had Loran, Satnav, in addition to the usual VOR and ADF navigation, but all the long range navigation wasn't working and they were too far from anywhere for the VOR or ADF to work. They had been "dead reckoning" for the last four hours and expected to fly over Flores, on the west end of the Azores, in an hour or so.

The pilot sounded quite experienced in this sort of thing, though I was amazed that you could get enough fuel into a C152 to make such a trip, even with the additional bladder tanks they must have had, especially carrying a passenger.

They had also lost their HF transmitting capability, so what they needed was for us to relay their predicament to Santa Maria and obtain some weather info for them. Their signal was coming in stronger now, so that, considering the enormity of the Atlantic, we really weren't that far from them. However, since they were only moving along at 80 knots and we were doing about 450 in our 767, we wouldn't be in contact with each other for too long. We were able to contact Santa Maria more easily than usual and relayed info back and forth for about 25 minutes.

About this time, the Cessna pilot said that he saw some lights below and thought that it might be Flores. He went down to take a look and confirmed his hunch. We found out from Santa Maria that Flores airport was closed since it was probably about 2 in the morning, local time. The Cessna pilot now knew his actual position and time (he was pretty much "right on" with his navigation) and the additional navigation on to Lajes would be rather simple. We were losing contact with him so we transferred him over to a United 767 that was about 30 minutes behind us.

Two days later, climbing out of Madrid for DFW, we were talking to Lisbon control on VHF, when to our relief we heard the Cessna on his way to the mainland (Europe): a much bigger piece of land to aim for! To make a short story long, there is a lot of radio "drama" that occurs well beyond the range of SWLs of any country.

Thanks, Doug. Your input is very much appreciated and we hope to hear more from you soon!

Incidentally, Doug also says that the ground control frequencies are probably the best to monitor around large airports. If you are not sure of the ground control freq of the airport in **your** area, send me an SASE and I'll find out for you.

Airline Addresses

Starting with this issue and continuing for several months, we'll print airline addresses for your use in sending reception reports. In addition, starting in December, we'll include addresses for air/ground radio stations, such as Rainbow Radio, Stockholm Radio, Houston Radio, ARINC, and others:

Air Canada
P.O. Box 14000
St. Laurent, Quebec
H4Y 1H4 Canada

Air China
Beijing Capital Int'l Airport
P.O. Box 100621
Beijing, People's ROC

Air France
1 Square Max Hymans
75015 Paris, France

American Airlines
P.O. Box 619616
Dallas/Ft. Worth, Airport
Dallas, TX 75261-9616 USA

American West Airlines, Inc.
222 S. Mill Avenue
Tempe, AZ 85281 USA

Air New Zealand
Private Bag
Auckland 1, New Zealand

Alaska Airlines
Seattle-Tacoma Int'l Airport
P.O. Box 68900
Seattle, WA 98168 USA

British Airways (Speedbird)
P.O. Box 10, Heathrow Airport
London Hounslow TW6 2JA
England UK

Delta Air Lines Inc.
Hartsfield Atlanta
International Airport
Atlanta, GA 30320 USA

Hawaiian Airlines
Honolulu Int'l Airport
P.O. Box 30008
Honolulu, HI 96820 USA

Japan Airlines
2-7-3 Tokyo Bldg., Room 824
Marunouchi Chiyoda-Ku
Tokyo 100, Japan

Lufthansa German Airlines
Von-Gablenz-Str. 2-6,
5 Cologne 21 Germany

Speaking of reception reports, now that I have your attention, let's discuss a few pertinent facts about them.

First of all, it's necessary to remember that unlike shortwave broadcasting stations, the transmissions we hear between aircraft and ground stations are not really intended for our ears. Consequently, stations and pilots on transoceanic flights may not be too excited about the fact that they were monitored in East Armpit, Illinois. So any QSLs and/or verifications that you may receive are sent out of courtesy more than anything else. This being the case, we have to be equally courteous on our end in order to get that desired QSL card or letter.

Some of the most important dos and don'ts in regard to sending successful reception reports are:

First, **please do remember to include return postage,** be it an International Reply Coupon, mint stamps from that particular country, or whatever, (except cash, that is)!

Secondly, **ask for a QSL/verification, don't demand it.** Also, it is usually advantageous if you can send a prepared QSL card with your report so that the person receiving it can just fill in the blanks.

If you should hear a pilot and a ground station operator having a heated exchange over some matter, do not refer to this in your letter by any means. Stick to the facts of time, date, airline, flight number, Selcal code (if given), departure point and destination (if known), and ground station worked.

You might want to include something about yourself in the letter — such as your type of receiver, antenna, what you do for a living, how long you've been an aero monitor, etc. If you have photos of your equipment, send along one or two of them. Possibly a postcard of your hometown airport could be added.

The airline addresses given above are to be used, obviously, when you are sending a reception report to a ground station. If you're sending one to an airborne station, it probably will reach the captain of the aircraft a lot quicker if you send it to the departure or destination station of that particular flight rather than to the company headquarters.

Your next question might well be, "But how am I to know the address of the airport?" Not to worry; when you send the reception report to the city of destination or departure of the flight in question, simply add the word "airport" or better yet, "international airport," and it'll have an increased chance of getting to the right person. Here's an example:

THE CAPTAIN
FAGIN AIRLINES FLIGHT XXX
INTERNATIONAL AIRPORT
NIBI NIBI ISLAND, ANTARCTIC OCEAN

As far as correct postage on the outside of the envelope goes, try calling your local post office and ask what exact postage will be to the country to which you're sending your reception report. If you're still unsure or unable to find out this information, a good rule of thumb to remember is better too much than not enough!

Keep in mind, though, all of the above won't automatically guarantee you a verification or QSL every time, but it will help to provide the optimum conditions to at least start you on the way to sending productive reception reports.

That about wraps it up for now, folks. We'll discuss more about reception reports in a future column. Next time, we'll talk to some of the folks at San Francisco ARINC, run some more airline and ground station addresses, and have a few other goodies for you.

Until then, 73 and out. MT

Why Beacons?

"Why listen to beacons? The only thing I'm going to hear is Morse Code being sent over and over again, right?" That's a question I hear often from those who have not yet ventured below the AM broadcast band. Since autumn usually marks the beginning of improved conditions, it seems like a good time to explain and hopefully inspire!

In North America, the radio frequencies below 500 kHz are populated mainly by *utility* signals; that is, signals not intended for the general public. There are all sorts of "ute" signals we could talk about, but the overwhelming majority are from unmanned Non-Directional Beacons (NDBs). If you've ever tuned across 190 to 530 kHz at night, perhaps you've heard their two or three letter Morse identifiers coming through.

Most U.S. beacons are operated by the FAA or the Coast Guard. Their official purpose is to transmit a constant "homing" signal useful for pilots and mariners who have radio direction finders on board. You can think of an NDB as a type of "electronic lighthouse." NDB shelters can be found in open fields, near airports, on piers. There's probably one near you.

What attracts listeners to the beacon band? I think Sheldon Remington summed it up best in his write-up for the *Aero/Marine Beacon Guide*. He emphasized that beacon DXers are interested in the *fact* of reception, not the content of the transmissions. You see, many NDBs run a mere 25 watts of power and are intended for short ranges only—usually less than 100 miles. When you use your operating skills and radio equipment to snag one at 500 or even 1000 miles, it can be quite exhilarating.

Once an intercept has been made, the beacon chaser wastes no time in searching for another new catch. With hundreds of beacons out there, and changes in frequency, power, ID, etc. constantly taking place, there's almost never a dull moment. Some listeners even keep detailed lists of their catches that they can proudly exchange with others. Perhaps you've noticed some of them appearing from time to time right here in *Below 500 kHz* as in the July issue, for instance.

Many of the same people who enjoy AM broadcast DXing also seem to enjoy hunting beacons. That's probably because the two bands are close in frequency, and the propagation characteristics are similar. In a way, beacon chasing has an advantage over broadcast DXing, as there's no need to wait for station identification. A beacon sends its ID continuously in Morse code.

Do you have code fright? Don't worry. Copying code from a beacon is easier than it sounds. Even if Morse Code is not your bag, keep in mind that the speeds used here are very slow—usually about three to seven words per minute. All you need to do is copy down the dots and dashes as you hear them, then refer to the Morse chart I've included here. Who knows, you could be on your way to upgrading that ham license!

International Morse Code

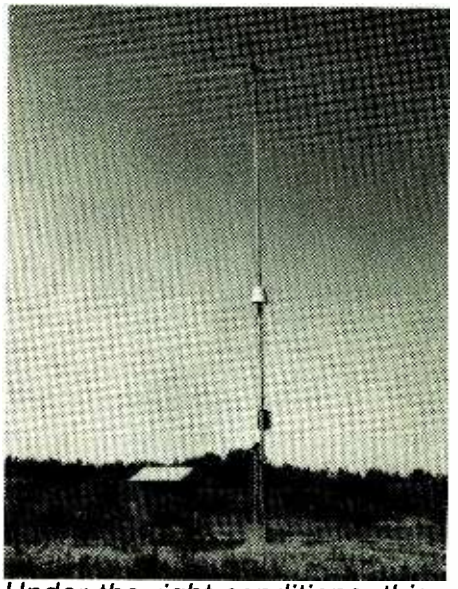
A • —	N — •
B — • • •	O — — —
C — • — •	P • — — •
D — • •	Q — — • —
E •	R • — •
F • • — •	S • • •
G — — •	T —
H • • • •	U • • —
I • •	V • • • —
J • — — —	W • — —
K — • —	X — • • —
L • — • •	Y — • — —
M — —	Z — — • •
1 • — — — —	6 — • • • •
2 • • — — —	7 — — • • •
3 • • • — —	8 — — — • •
4 • • • • —	9 — — — — •
5 • • • • •	0 — — — — —

Sometimes the Morse identifier gives a clue about the location of the beacon ("RO" for Rochester, "SF" for San Francisco, "SV" for Savannah, and so on). To determine exactly where a beacon is located, however, you'll do better to consult a beacon directory. I like to use the *Aero/Marine Beacon Guide* for this purpose. At $15 postpaid, I consider it one of the best values in my shack. A new '93 version of the *Guide* is currently available from Ken Stryker, 2856-G West Touhy Avenue, Dept. MT, Chicago, IL 60645.

The ultimate goal for many beacon chasers is to obtain a QSL card confirming their reception. To do this, it is usually necessary to draw up a simple card yourself and mail it to the Engineer-in-Charge for his signature, along with an SASE. Again, the *Aero/Marine Beacon Guide* is an excellent source for QSL information. It also shows examples of suitable cards you can make.

"Collecting" beacons can be an absorbing hobby. One listener in Virginia, a frequent *MT* contributor, has logged well over 600 stations and is still going strong. His impressive list includes not only U.S. beacons, but several from Cuba, Mexico, Canada and the Caribbean. Another listener I know uses red pushpins on a wall map to show all the cities he's logged.

I'd like to hear from you if you decide to take the plunge into basement band DXing. Tell me what you're hearing and what type of equipment you use. As always, if I can help with any questions, please write to me c/o Monitoring Times, P.O. Box 98, Brasstown, NC 28902. An SASE guarantees a response.



Under the right conditions, this low-powered beacon could be heard hundreds of miles away (LJG, 212 kHz-near Rochester, NY).

Mail Call

Why restrict yourself to a conventional written log? Mike Csontos of Lima, New York, has been experimenting with a new kind of log in the form of a road map. He uses a ruler to plot lines from his location to each beacon he hears. The plots look something like the spokes of a wheel, with the "hub" centered on Mike's home town.

With the information presented graphically, it gives a clear picture of where most of your signals come from, and where your farthest catches are. Along each line, you could easily write in the ID of the beacon, its power level, the mileage, etc. I think this idea has good possibilities for LF work.

End Notes

Along with the changing seasons, a very positive change has come to our household recently with the arrival of our first child, Bryan. I'm sure he'll keep us busy in the coming years, along with our other ongoing responsibilities! See you next month!

LF Tip of the Month:

No longwave coverage on your receiver? An inexpensive outboard converter might be the way to go. You could build one, like the circuit shown in *Demaw's Workbench* (January 1993), or you could hook up a ready-made commercial unit.

Spring Valley Says *Shalom*!

"Where is the Rabbi?" It's a few minutes after one in the afternoon, and his show is already on the air, but the host is nowhere to be found. "He went to get his jacket out in his car!" yells the receptionist in the next room, munching on a donut. The board engineer quickly ad libs: "Stay tuned for Rabbi Yaakov Spivak here on the all-new WLIR...all-Jewish, all-the-time." He closes the mike and yells "Where is he?"

The chaos is only temporary. Today is the day that a report on the Crown Heights riots has been released, harshly criticizing the inaction of New York City's Mayor Dinkins. In just two and a half months on the air, WLIR has already established itself as the definitive source for Jewish opinion, and the press are descending on the Rabbi for his point of view. Mary Civiello, a correspondent for WNBC-TV, is speeding to the studio with her camera crew. Rabbi Spivak wants to look his best on tonight's six o'clock news.

A soft piece of music begins to play over the air, filling some air time. The receptionist listens to a Realistic portable radio that hangs by a string from the ceiling. The door bursts open and the Rabbi is flustered. "They'll be here in a minute! How do I look?" The record fades away and Rabbi Spivak is on the air. Time will fly during his two hour show today. Everyone listening is calling in to air their opinion about Crown Heights. Mayor Dinkins dragged his feet while Blacks and Jews clashed in Brooklyn, the report proclaimed, and WLIR is the sounding board for the Jewish community.

Fifteen minutes later, the Rabbi welcomes the Channel 4 crew into the studio, and videotape is rolling. Rabbi Spivak is in his glory! A large man with a big heart for his people, Yaakov Spivak always has a lot to say. After all, he is a talk show host! Mary Civiello sits down in the makeshift studio and instantly becomes an on-air guest. Excitement fills the room, and Rabbi Spivak is the centerpiece. How did this AM radio station become such a vital part of a religious community?

Zev Brenner enjoys his new radio station.

One man is responsible for this mitzvah. Zev Brenner is a former optician, but now all he sees is success. A self-taught broadcaster, Zev is guiding this dilapidated radio station through a miraculous recovery. WLIR had been suffering for years, barely staying on the air by playing big band music and worn pop records.

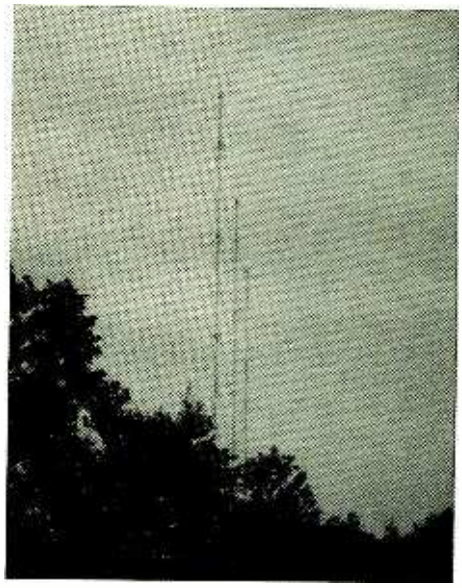
Zev bought the station to complete another chapter in his book of dreams. On May 10, 1993, WLIR Radio, broadcasting with 500 watts on 1300 AM, became America's first "all-Jewish all-the-time" superstation, providing a unique broadcast service to a diverse collection of Jewish neighborhoods throughout the New York City suburb of Rockland County. WLIR is also available via satellite on Satcom F2R, transponder 18, 8.2 MHz subcarrier. Eventually, Zev hopes to serve every Jewish community in America!

After speaking to Zev Brenner for several minutes, it becomes apparent that his success as a broadcaster is not by accident. Zev has been an on-air host for years on a variety of ethnic radio stations in the New York area, and hosts a weekly television talk show on cable's The International Channel. The man is driven with energy, ambition, and a memory filled with the names of friends who are always willing to aid his cause. Soft spoken and modest, Zev is an influential man with his work cut out for him.

WLIR's finest assets are its programming and its license to broadcast. Everything else needs work, but improvements are being made rapidly. Without any income in past years, the station's former owners let WLIR's facilities fall into disrepair. An inefficient transmitter still operates 'way below allocated power and the antenna and ground system needs to be rebuilt. The studio is jury-rigged with left-over bits and pieces of equipment. A small office next door doubles as a production studio centered around a Radio Shack mixer.

It won't look this way for long! A new Omnitronix solid-state transmitter will be installed soon, along with modern audio processing equipment, bringing new strength to their signal. Components essential to a new studio are hastily being gathered, and bare offices are being readied for construction. Plans for a power increase and moving the station into the new expanded AM band above 1600 kHz instills optimism about the future. Signs of success are everywhere.

Zev Brenner utilized a basic principle of American entrepreneurial spirit: He recognized a need and met it. Zev bought WLIR because it serves Rockland County where more than thirty



Look for WLIR's towers right behind Toys 'R' Us!

percent of the population is Jewish. Just thirty miles north of New York City, there could be no better place for a radio station dedicated to their religion and culture. "We have a very enthusiastic and loyal audience because there is nothing like it on the radio today. People tune in early in the morning until late at night. They don't switch the dial!"

Many orthodox Hasidic Jews refuse to watch television, and turn to their radios for entertainment and the latest news. Zev explains: "The more orthodox families want to insulate their children from some of the evils of television. There's a lot of violence and pornography. They believe they will lead a simpler, safer, more innocent lifestyle by having all the children of their school not watch TV. They'll be reading a book. We have a children's show on Wednesday night, and the kids go through the roof!"

No other station in America has programming like WLIR. Rabbi Spivak is only one of several community leaders who are heard regularly with their ideas and commentary. Many rabbis double as radio hosts, and local talents produce a myriad of listening choices. Tune in to WLIR and you might hear legal advice, lessons on the Torah (the Jewish scriptures), children's entertainment, or the clever humor of "Chutzpah on the Chudson." You may be surprised to hear Guardian Angel leaders Curtis and Lisa Sliwa preside over a WLIR talk show tailored for the Jewish communities of Rockland County. WLIR's music library is filled with contemporary Jewish music, along with favorites from decades past.

Adding to its unusual nature, WLIR serves a local Haitian population and other ethnic groups

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.

during the 26 hours of the Jewish Sabbath, from Friday night through Saturday. You'll never find a station more fresh, vibrant, and filled with enthusiasm! "We are innovative in the sense that we believe radio should be the way it used to be, not just all music. We're a combination of news, talk, quizzes, game shows, serials, soap operas, the whole works!" Zev proclaims.

Possibly the most popular and important programs on WLIR are newscasts customized for the Jewish listeners it serves. "We have world Jewish news at the top of every hour. If you want to hear news about the Jewish community and about Israel, or if you want to hear about Crown Heights, we're the only Jewish radio station around that's all-Jewish all-the-time. We are a leader in the issues affecting the Jewish community." Hourly newscasts are produced by Garden State Radio in New Jersey, exclusively for WLIR. "We also have a reporter in Jerusalem, and he has a sponsor to cover his costs," Zev explains. "Twice a day, we air his live report from Jerusalem." On-the-scene reports from correspondents in Florida and Canada add to WLIR's international spirit.

Zev's company, Talkline Broadcasting, depends on two sources of income to insure WLIR's future. Along with traditional sales of individual advertising spots, the station also sells air time to independent producers in half hour or larger blocks. The program producers pay a flat fee to broadcast on WLIR, and sell advertising on their particular shows to underwrite their costs. "We give a very affordable opportunity to Jewish broadcasters, in this area and around the country, to be on the air," claims Zev.

Local businesses have discovered WLIR's potential to develop a huge new clientele. With Jewish listeners riveted to one station, advertisements on WLIR produce immediate results.

WLIR is on the air in Spring Valley, New York, but this is only the beginning! Zev is negotiating with cable television operators in the New York City area and beyond to include his satellite signal as part of their cable FM package. Syndication of WLIR's programming to other stations around the country may begin in the near future. "This is the first step in servicing the Jewish community in the United States. That's why we went satellite from day one. People are frustrated! They want to hear our programming!"

Bits 'N' Pieces

• The stampede is on for AM radio's new 100 kilohertz! Over 700 station owners have applied to move their operating frequency above 1600 kHz. Many will be disappointed because the expansion band can only house 200 to 250 residents. This new piece of radio real estate is being opened to development to lower the congestion heard when AM stations intermingle, especially at night. By adding ten more frequencies, fewer stations will be on each channel resulting in better reception for all.

The FCC will soon decide how these new frequencies will be allocated nationwide, and which stations will be assigned to each slot. Most expansion band broadcasters will upgrade to 24 hour a day operation with increased power and larger coverage areas; and will simulcast on their old and new frequencies for up to five years.

• Intelligent "Video Radios" are now available in stores nationwide. Using a system called RBDS, you can now instantly see what station you are listening to, or what song is playing, or learn about traffic, weather, contests, stock quotes, or even airline schedules by reading the radio's front panel alphanumeric display. If you are listening to the radio, or playing a cassette or CD in your car, these receivers can automatically interrupt your program to announce traffic alerts and other hazardous conditions.

On a long trip? Just program the radio to follow your favorite program, and it will continually scan the dial for the strongest available signal for your enjoyment. You'll never have to manually search and scan again! Over 60 stations transmit RBDS information on their 57 kHz subcarrier around the country, with more stations going on line daily. Soon you'll be saying: "You just won't believe what I read on my radio today!"

International Bandscan

Radio in The United Kingdom is changing rapidly! Many new Independent Local Radio stations are coming on the air, filling the AM and FM bands with a variety of diverse and unusual programming. Many new ILR stations are being issued licenses with the proviso that they broadcast formats serving special interest groups, or provide types of music or talk unavailable elsewhere. Applications for top 40 popular music stations are quickly dismissed, but some stations push the limits of their assigned formats. London's "Jazz FM" often broadcasts Motown and R&B music, especially during morning and evening drive-time when audiences are at their peak.

It's rather ironic that as British radio stations continue to become more individual and unconventional, American radio is relying more and more on generic satellite-delivered formats with little local identity. Until next month, take advantage of the beginning of AM DX season and happy trails!

MT

Those Astonishing Amateurs

The best kept secret in all of amateur radio is also the relatively unknown side of the satellite industry. Garnering an astonishing amount of cooperation from government, military and industry, amateur radio enthusiasts have been designing, building and launching their own satellites for over thirty years.

Just four years after the Soviets shocked the world with the launch of their Sputnik I spacecraft, a group of West Coast amateurs built and cajoled the military into launching their own satellite, OSCAR I (Orbital Satellite Carrying Amateur Radio). The date was December 12, 1961; total cost of the satellite: $26.

Throughout the years this group has not only kept up with the rapid pace of the electronics and aerospace technologies, but it has built the complex international organization necessary to continue. The Radio Amateur Satellite Corporation (known simply as AMSAT) began in 1969 as a non-profit, educational corporation. Similar independent organizations were quickly established in the Soviet Union, Great Britain, Australia, Germany, Brazil, Japan, and other countries.

Understanding Amsats

Unlike the geostationary orbit satellites which are used for commercial distribution of voice, television and data, amateur satellites (amsats) are in low and mid Earth orbits which cause them to move about. For this reason, any particular amsat may not be heard except at predictable intervals during the day. To understand these orbits and methods of tracking them, some further reading is in order. Information on all these resources can be found at the end of this column. An excellent beginner's guide is called *How To Use The Amateur Radio Satellites*, Third Edition, by Keith C. Baker KB1SF. This 46 page, 8-1/2 x 11 inch book is available from AMSAT.

Tracking amsats couldn't be easier with the large catalog of software available. If you have a C-64, C-128, Amiga, Apple, TRS, Atari, PC, or MAC, there is a useful program for keeping up with the amateur satellites.

A full discussion of the topic is painstakingly given in *The Satellite Experimenter's Handbook* by Martin Davidoff K2UBC. This enormous text is well written and amply illustrated and contains enough information to satisfy your every curiosity on the subject. In sixteen lengthy chapters and with six appendices, Davidoff covers everything needed for the beginning and advanced amateur satellite enthusiast. There are even some very handy tips on building transmitting and receiving antennas for working these satellites.

Monitoring Amsats

The array of amateur satellites currently in orbit provides a wide variety of communications, from CW (Morse code) and SSB (Single Side Band) to high speed packet and video via Charge-Coupled Device (CCD) cameras. Table 1 is a list of the amsats currently in orbit and their modes and downlink frequencies.

Most *MT* readers already have in their listening posts the gear required for monitoring these satellites. If you have a shortwave radio and a scanner capable of tuning the amateur 2 meter band (144-148 MHz) and the .70 meter band (420-450 MHz), you already have the makings of an amsat listening post! To expand your listening capabilities your receivers should also be capable of FM, CW and USB reception. If you want to monitor *all* the action, you'll also need a computer and various peripheral hardware and software.

Table One: Monitoring The Amsats
(Only the downlink frequencies are listed.)

Satellite	Country	Mode	Downlink Freq. (MHz)	Notes
RS-10/11	Russia	CW/SSB	29.360-29.400	RS-11 currently off
		CW/SSB	145.860-145.900	
		Beacon	29.403	
		Beacon	145.903	
RS-12/13	Russia	CW/SSB	29.410-29.450	RS-13 currently off
		CW/SSB	145.10-145.950	
		Beacon	29.4543	
		Beacon	145.9587	
FO-20	Japan	CW/SSB	435.800-435.800	
		Packet	435.110	
		Beacon	435.795	
AO-21	Russia	SSB/CW	145.852-145.932	
	Germany		145.866-145.946	
		RUDAK (Multi-mode)	145.983	
		Beacons	145.822 and 145.983	
		Telemetry	145.800	
UO-11	U.K.	Telemetry	145.825	Telemetry downlink only
		Telemetry	435.025	Tells current status of
		Telemetry	2401.5	satellite.
UO-14	U.K.	Packet	435.070	
UO-22	U.K.	Packet	435.120	
KO-23	Korea	Packet	435.167	
		Packet	435.120	
AO-16	USA	Packet	437.02625	
		Packet	437.05130	
		Packet	2401.1428	
DO-17	Brazil	Packet	145.82516	Uses normal TNC packet
			145.82438	modem and normal 2 meter
			2401.2205	rig. Downlink only.
WO-18	USA		437.07510	Requires special modem to downlink television images
LO-19	Argentina	CW	437.125	
AO-10	USA	Beacons	145.987 /145.810	
AO-13	USA	Beacon	145.985	This is the AMSAT DX bird
			145.812	Listen to CW beacon for
			435.651	AO-13s sked & bulletins.

Looking Ahead

The interesting thing about the various amsats is that they are, for the most part, different. Each has a different purpose and, in the spirit of experimentation, each is watched closely with an eye to designing the best aspects of each into the new phase of amsats. The current new phase is called Phase 3 and continues the trend toward longer range and a higher level of reliability.

Phase 3 birds are designed to fly in the highly elliptical orbit typical of the Russian Molniya spacecraft. This is a desirable trait in an amateur satellite in that it allows longer periods of use at a time and yet it is available to operators around the planet.

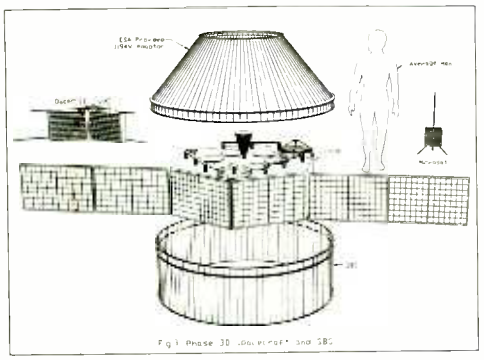
The latest design in amsats is Phase 3-D pictured here. The Phase 3-D Project Team includes hams from Germany, North America, Great Britain, Japan, Finland, South Africa, Russia, and Hungary. According to AMSAT-NA (North America), AMSAT-DL (Germany) has "secured a flight opportunity on one of the two test flights for the new Ariane 5 launch vehicle under development with the European Space Agency (ESA)." The test flight is scheduled for 1995-96. This is forunate timing as the latest amsat in the Phase 3 series (AO-13) is expected to reenter the Earth's atmosphere in late 1996.

What's on Phase 3-D?

"Something for everyone" could easily be the theme for the Phase 3-D satellite. This new bird will downlink on the 29, 145, 436, 2400 and 10,500 MHz bands. According to AMSAT, "...when combined with on-board power capability of 600-700 watts, Phase 3-D's high-gain antennas will produce effective downlink powers as high as 10 kilowatts."

In addition, Phase 3-D will "...include a GPS receiver that will allow the satellite to tell ground controllers where it's located at any time. Three digital cameras, tied to the 2400 MHz downlink, will also be included. Two of these cameras will point Earthward. Another, combined with an astronomical telescope, will point toward the stars and planets."

Another interesting aspect of Phase 3-D is a 10 meter beacon which will be a transmit-only,



AMSAT

AMSAT's Phase 3D Spacecraft. To understand the size of this satellite, the figure of an average man; Oscar 13, the latest of the "big" amateur radio satellites; and a Microsat, which weighs less than 10 pounds, are also shown. According to AMSAT "...the satellite will weigh some 800 pounds at launch. It will also be about 7.5 feet in diameter and about 3 feet high. With its solar panels extended, Phase 3-D's 'wingspan' will be over 20 feet. Phase 3-D's elliptical orbit will vary from a maximum height of 29,000 miles above the Earth to a low of some 2,400 miles."

double sideband (AM) voice transmitter aimed at the non-satellite audience. This will allow AM transmissions receivable on any shortwave radio in a "broadcast" mode carrying information and perhaps programming involving amateur radio to the world's public. Who will get the first SWL QSL card from this satellite?

AMSAT is currently involved in a membership drive through which it hopes to help finance this ambitious project. Thousands of hours of valuable engineering design time is given to this project for free. Still, out of pocket expenses for materials for development and launch will come to about $4 million dollars. This is a very sophisticated endeavor and one from which all hams and monitoring enthusiasts could benefit. Your membership in AMSAT and donations from the purchase of various AMSAT related materials will help.

If you'd like to join AMSAT, write or call the Radio Amateur Satellite Corporation, 850 Sligo Avenue, Suite 600, Silver Spring MD, 20910. Phone: 301-589-6062 or FAX: 301-608-3410 Monday through Friday from 10 AM to 5 PM ET. To new members only, they are offering one year memberships which include a copy of the aforementioned *How To Use The Amateur Radio Satellites* by Keith Baker; ORBITS software—the PC compatible program for tracking the AMSATs on a 5-1/4" floppy disk; plus a subscription to *AMSAT Journal*, the bi-monthly journal of amateur satellites. Membership fee is $30. Individual publications are available from AMSAT as well. Write for details on their various books and software programs.

Transponder Notes

• In order to make way for "emerging technologies" on the 2 GHz band, the FCC had been contemplating moving the thousands of existing fixed microwave links in that band to the 4 GHz range of C band. Cooler heads have prevailed, and C band will be dropped from the list of possible new homes to what would most certainly have produced a terrestrial interference nightmare for C band users.

• United Video has begun uplinking KJAZ San Francisco on the Galaxy 5 channel 7, 5.58 and 6.12 MHz audio subcarrier. The station is competing with previously established KLON Long Beach, which is commercial free and listener supported, and which is found on Spacenet 3 Channel 15, 5.58 and 5.76 MHz.

• The venerable data service Electra has left the hidden confines of the TBS Superstation verticle blanking interval. If none of that made any sense to you, consider yourself deprived. For eleven years Taft broadcasting of Cincinnati, Ohio, operated a primitive data service called Electra, the digital signal of which was transmitted on TBS. Reception required only a small RAM-only computer which stored the data for retrieval via a small handheld infra-red remote control. The data was displayed on the user's TV by way of an RF modulator.

The fact is, Electra technology was swamped by X*Press Information Services. Using the data stream of the very same TBS Superstation, X*Press provides subscribers with hundreds of pages of news from services from all over the world: literally too many to mention here. Using fancy text manipulation and other computer technologies, X*Press made Electra unnecessary. Too bad. It was a great idea whose time came and went and few even knew about it.

• 1994 will see the launch of two new basic services. PBS will offer Horizons TV, a basic cable service featuring a variety of intellectual activities; and a commercial group will launch a channel called Booknet, which will sell books to viewers as a sort of intellectual shopping channel. It is said that Booknet will spend tens of millions to get up and running.

A more ambitious project is from Motorola, which is well on the way to launching its Iridium project. The idea is to have a system of 66 small satellites in low Earth orbit which would relay voice, data, fax, and other signals to any other place in the world. The system is supposed to be in place by 1998 and cost over three billion dollars. If the system seems familiar, it should. AMSAT's system of microsats has been doing exactly the same thing for hams for years.

• Hughes Communication's latest satellite, Galaxy 4, is up and running in place of Galaxy 6 at 99 degrees west. This powerful satellite features 24 16-watt C band channels and 24 50-watt Ku band channels. Launch of this satellite was delayed for so long that it came as a surprise to see the color bars and billboard announcing its presence during testing in mid-July. By the way, SCPC experimenters will enjoy the vastly improved signal levels of their favorite broadcasters.

For those who are obsessed with tracking the inclined orbit satellites, there is a new book out which may be of interest. Called *The Inclined Orbit Satellite Tracking Guidebook* by Mark Long and Jeffrey Keating, it is published by MLE, Inc. The two authors are long time writers in this field. For more information write Mark Long Enterprises, Inc., 150 North Federal Highway, Suite 230, Fort Lauderdale, FL 33301.

MT

Ike Kerschner, N3IK

DXCC

No, DXCC is not Roman numerals for the year ham radio began! It is an award issued by the American Radio Relay League for working 100 countries. There are, in fact, 12 different DXCC awards. They are: Mixed (combine any mode and band/s), Phone, CW, and RTTY. You may use the mode of your choice on any band/s to earn these four awards. Then there are the band awards in which you work 100 countries on any of the following bands: 160, 80, 40,10, 6 or two meters, any mode. The Satellite DXCC rewards those who confirm 100 countries using any or all of the various amateur radio satellites. Then there is the real biggie: the Five Band DXCC. For this one you must work 100 countries on each of five bands.

To add icing to the cake, one can get endorsements for working additional countries and modes (for example, working 100 countries on 160 meter SSB, etc.). In truth, an amateur can spend years attempting to garner all the awards available through this program (and spend a lot of money and ruin a marriage or two in the process).

Is It Good?

Oh yes, the DXCC program is very good. It has sparked a lot of enthusiasm and kept many amateurs active who would have dropped out of the hobby were it not for the ultimate challenge of working ALL available countries. In addition, it has sparked numerous international friendships (started a few minor wars, too), and encouraged travel through DXpeditions (traveling to a country with few or no hams to activate it on the bands). In general, it is one of the more worthwhile awards available to amateurs. However, it has a few flaws.

Encouraging Bad Habits

In the search for all countries, too many stations run extremely high power and use it in a ruthless manner. In addition, many stations look only for the country and conclude a contact in seconds, for example, "N3IK, 59, 73"--that's it! most of the time no name or other information has been exchanged, but N3IK goes off happy as a clam because he has another new one worked!

In my opinion, this is the down side of the DXCC award. I cannot see why working every country on the globe should be a big deal if done in the above manner. On the other hand, if you work stations in 100 countries while operating in a casual fashion and exchanging meaningful information, perhaps following up by sending off a photo and letter to your new friend, then something of value has been accomplished!

Prevailing attitudes toward DXCC encourage some of the worst operating imaginable! While listening to a pile-up to work a rare station, one frequently hears the entire gamut of bad habits, from the guy who splatters all over the band, to the dingbat who will curse other stations and deliberately interfere with everyone else. Unfortunately, there are all too many stations who feel that if they cannot work the rare one, then no one should, or conversely, who want no one else to be heard after they have worked him.

To be fair, many other awards promote similar behavior.

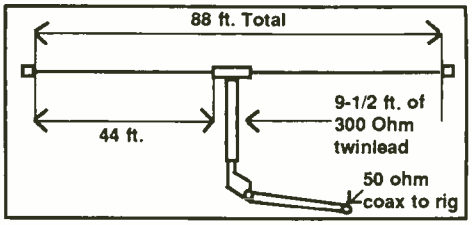
What to do?

How about elimination of the endorsement? Work 100 countries and that's it—no published lists of who's on top or near the top. Or perhaps make it mandatory that more than a signal report and call be exchanged. A third suggestion would be to not accept a country that does not have a resident ham—in other words, eliminate DXpeditions.

I have no doubt that these suggestions will annoy a good number of hams: but ask yourself what a signal report and call exchange really mean to you! If you want to enjoy ham radio, get on the air and *talk* to people (and use reasonable power).

Erling Gruel, WB9OJD, sits at the operating position of his station in Fond du Lac, Wisconsin. Erling has a Drake TR-4 transceiver and inverted V antennas on 40, 20, 15 and 10 meters; a 10 element 2 meter beam; and a Ringo Ranger, also for two meters. He is active on CW, SSB, FM and packet. Erling also has a CSI simplex autopatch on two meters (more about this interesting device in a future column).

That's a neat looking station, Erling! How about some more station photos, gang? Keep the letters coming, too.



Extended Double Zepp

Sounds like an exotic flying machine, doesn't it? Actually it is an extremely effective and easy to build antenna.

I have been trying to copy some fairly weak 20 meter Slow Scan TV signals from stations in the western USA and the Pacific region without too much success. While I have several good antennas, none are directional or provide a lot of gain. The cost of a beam was out of the question, so I put up an extended double Zepp at about 30 feet (aimed east and west).

The results were outstanding and I was able to copy signals solidly with no problem. The extended double Zepp is bi-directional broadside and provides three (3dB) of gain over a dipole (which is as good as a lot of small, *expensive* beams).

See the figure above for the low-down on building your own 20 meter EDZ. The stub of 300 ohm transmission line should be of the transmitting variety. Simply connect 50 ohm coax at the bottom of the 300 ohm stub. Cut to the dimensions shown, the antenna will provide a flat response (under 2:1 SWR) across the entire band.

Two EDZ antennas at right angles will provide excellent worldwide coverage at a price far less than any Yagi. In addition, by phasing two EDZ's you will obtain 6 dB of gain for very little investment.

If you prefer, a completely built Extended Double Zepp for any band (including the SWL bands) can be purchased from the Ant Farm, PO Box 3196, Wescosville, PA 18106. Prices range from about $22.00 for a ten meter unit to $65.00 for a 40 meter model. Write for their catalog sheet.

RS-15 (Radio Sputnik)

The next Russian amateur satellite is scheduled to go into orbit sometime in late September

Rob Leonard's

Ham DX Tips

This is an excellent month to decide for yourself whether you agree with Ike's comments regarding contests. With the *CQ Magazine* Worldwide SSB contest occurring on the 30th and 31st, there will be many DXpeditions to rare and semi-rare locations taking place before and after the contest. During the contest, stations will exchange a signal report and the CQ Zone they are located in (there are 40 worldwide). Here are some DX tips to get you in the mood 'til the contest starts.

ANGUILLA If not downed by hurricane activity, the 2 meter repeater here has a wide coverage and can be keyed up by transmitting on 145.300 MHz and can be heard on 145.900 MHz from St. Martin, St. Kitts, or the British Virgin Islands easily. US amateurs wishing to operate from here should, well in advance of their trip, contact the ARRL, which can advise them of the proper procedures to obtain permission to operate. ***AZERBAIJAN*** At approximately 0300 UTC on 14020 to 14025 kHz CW, or from 1200 to 1300 UTC on 18070 to 18075 CW, look for UD6DKW (whose QSL manager is: DL6KVA, Axel Schernikau, Postfach 02, 0-2565 Kuehlungsborn, Germany). ***BURKINO FASO*** XT2BW (QSL to: WB2YQH, P.O. Box 73, Spring Brook, NY 14140) will only be active from here 'til the end of the year, so now is the time to get him in your logs. He has been active on 18080 kHz CW at 1630 UTC. He is also active on 10103 kHz CW at 2100 UTC and 7005 kHz CW 0530 to 0600 UTC. ***DX NETS*** Here are two 40 meter nets to try for. Starting at 2300 UTC, UL7LS operates a net on 7043 kHz SSB, made up of amateurs from the Commonwealth of Independent States wishing to work North Americans by listening to 7200 kHz SSB. The US 40 meter DX group meets on 7180 kHz SSB at 0600 UTC (times and frequencies subject to change due to QRM from SW broadcasters) weekends. The group works DX stations on its frequency and SSB frequencies below 7080 kHz. ***IRAN*** 9D5CW (Najib, Box 24755-154, Tehran, Iran) has been on the 14246 kHz SSB DX net at 2300 UTC several days a week. Or, for CW fans, try 14015 to 14020 kHz CW at 0400 UTC most days. ***KOREA*** Now 'til the end of November, several Korean amateurs will be using the special prefix HL93 in honor of the Taejon International Exposition. An award can be earned for contacting or hearing a HL93 prefixed station; the amateur contacted will provide the details. Special events station 6K93XPO will also be active operating from the Taejon Exposition site. ***MEXICO*** Newly licensed, entry level licensees here are being issued callsigns starting with the prefix XE0. You can find these amateurs on 7000 to 7050 kHz CW, 7050 to 7100 SSB, and on 2 meter FM 144 to 148 MHz. ***MALAWI*** 7Q7XX has been on 10101 kHz starting at 2200 'til 0100 UTC most days. QSL to JH3RRA, Shinya Takenaka, Box 21, Katano, Osaka 576, Japan. ***PAKISTAN*** AP2KS (Khalid Sakoor, House 5 A, Pirmaki Street 2, Ravi Road, Lahore, Pakistan) has been on 14085 kHz at 1615 UTC most days.

Good luck in the upcoming contest, if you choose to try for the varied DX available then. 73 de Rob.

or early October. RS-15 will go into a high elliptical orbit and be available to hams in the northern hemisphere for about 12 hours a day.

As with the other RS satellites, RS-15 will include a robot CW operator that you can talk to, and will have a wide variety of uplink and downlink frequencies. This promises to be an easy-to-work bird with lots of potential for the average ham. The ten and fifteen meter links will allow anyone with a Tech plus license access to space communication.

More on this bird as soon as information is available. Let's all hope for a successful launch. Many thanks to our brother and sister amateurs in Russia for the effort they have expended building and launching this machine!

PA QUO Party

October 9 and 10 are the dates for the Pennsylvania QUO party (see details in *CQ* or *QST* contest columns). N3IK will be active from rare Elk County: a special QSL will be sent to all who request it. Activity will be on CW and SSB on all bands.

Six Meters

Are you active on six meters? If so, I would like to hear from you. Please inform me of mode, power, antenna and hours of operation, and whether you have SSTV or Packet capabilities. In addition, information on Packet BBS's on six meters would be appreciated. Please send all info to me C/O Monitoring Times, PO Box 98, Brasstown, NC 28902. This information will be used to plan a six meter operating activity for next summer.

The July column included a review of Pasokon Slow Scan TV software, but I failed to provide an address in case you cannot find the package locally. For more information or pricing, write to PASOKON, 115 Stedman St., Chelmsford, MA 01824-1823.

73 es Happy Halloween, Ike

MT

George Zeller

Radio Brod Off Air, Then On Air

Radio Brod, the European Community shipboard clandestine broadcasting to Bosnia and Serbia on 720 kHz, has been operating in turbulent waters. Last month we pointed out that this station transmits from a French ship anchored in the Adriatic Sea. Its broadcasting activity was erratic during the summer. The July 26 edition of the *Washington Post* reported that Radio Brod ceased broadcasting on June 28. Thanks go to *MT* reader John Hollowell of Port Republic, MD, for a copy of this article.

Interestingly, the broadcasts were stopped by an exchange between the International Telecommunications Union and the government of St. Vincent and the Grenadines! Radio Brod's official ship registration permits it to fly a St. Vincent flag. This small Caribbean republic withdrew its ship registration after complaints to the ITU from Serbian President Slobodan Milosevic. Serbia contends that broadcasts from International Waters to Balkan countries are illegal under ITU rules.

Radio Brod, which means "Boat Radio" in Serbian, subsequently resumed transmissions on July 29. Station director Dragica Ponorac had approached France, Italy, and other countries in an attempt to replace the transmitter vessel's withdrawn St. Vincent flag. This proved unnecessary, according to regular *MT* reporter Patrick Crumhorn via Glenn Hauser's "World of Radio" program. The ITU revised its stance under pressure from the EC, ruling that Radio Brod can legitimately broadcast. The vessel's registration and flag have been restored by the government of St. Vincent and the Grenadines.

At least for the time being, Radio Brod is back on the air. But, the situation in Serbia, Bosnia, and Croatia has been changing on an almost hourly basis. The station's signal is not very good even in Belgrade, so it is probably an impossible DX catch in North America. Still, it would be a good idea for east coast medium wave monitors to check out 720 kHz; you never know when miraculous propagation might be in effect.

TV Marti Off

The blimp that supports **TV Marti's** high altitude antenna in the Florida Keys suffered another episode of wind damage in March. The USA's anti-Castro television semi-clandestine has been off the air since then. The silent channel may be permanent, according to a July 10 *New York Times* article submitted by *MT* reader Scott Edwards of Los Alamitos, CA.

During legislative action on President Clinton's budget proposal that Congress passed in early August, the House Appropriations Committee voted to eliminate TV Marti's entire $14 million line item from the federal budget. The committee also voted a substantial cut in the **Radio Marti** budget. The exact details of Marti appropriations in the final budget were not available at column deadline time, but TV Marti's days appear to be numbered. Both Marti operations have been criticized on grounds that they are inappropriately politically dominated by Jorge Mas Canosa's Cuban American National Foundation.

Brother Stair On?

Brother Stair, leader of the Faith Cathedral Fellowship Inc. in Walterboro, SC, has repeatedly announced plans for a shipboard shortwave transmitter. His religious talk shows are currently relayed by USA shortwave stations such as **WRNO.** The maritime transmitter project is designed to replace the current purchased relay time on private USA international broadcasters.

Both the "Outer Limits" and Glenn Hauser have been following this story in *MT* for months. We now hear directly from Brother R. G. Stair. He reports that a ship with four transmitters is being "prepared," but that the project is still "in the planning stage." Stair says, "I am sold on the great means of broadcasting to the whole earth on shortwave." Stay tuned.

Pirate TV?

Mbanna Kantako, longtime FM pirate operator of **Black Liberation Radio** on 107.1 MHz in Springfield, IL, has announced future plans for a local pirate television network! Despite an FCC bust, Kantako's radio station has maintained a 24 hour schedule for two consecutive years. The TV station, which could cover a significant area within Springfield, is anticipated later this year.

Kantako still complains about "political" harrassment from the FCC, local police, and the Springfield Housing Authority. Thanks go to *MT* reader Lloyd Leheney of Springfield, IL, for a copy of an *Illinois Times* article about the situation.

Ernest Zündel

Glenn Hauser's "Review of International Broadcasting" #145 (via Ernie Behr) accurately points out that Ernest is a Canadian neo-Nazi publisher. His **Voice of Freedom** clandestine is relayed over **WRNO** on 15420 kHz at 2100 UTC Sundays. Our regular reporter Alan Masyga of Winona, MN, was stunned by the viciously anti-Jewish content of Zündel's programs, which are hard-hitting even by the typically nasty standards of clandestine stations.

Ancient Clandestine

Clandestine broadcasting has been around for many decades. There is plenty of historical research that could be done on the topic. For instance, the September 1924 issue of *Wireless Age* magazine printed an interesting article with a headline of, "Brazillians Use Radio to Conquer Rebels." Brazil's Secretary of War, Marshall Setembrino de Carho, dropped 300,000 leaflets on rebels holding Sao Paulo in 1924. He warned them with a radio broadcast "that military operations against the rebels will soon assume a more stern character."

I found this gem at Gary Schneider's "Play Things of Past." Gary stocks a large selection of antique radios, magazines, and memorabilia. A copy of his interesting catalog is available for $2 via 9511-23 Sunrise Blvd., Cleveland, Ohio 44133. Tell him that *Monitoring Times* sent you!

KIWI and DLR

Our friend Gigi Lytle of Lubbock, TX, continues to be one of North America's top DXers of pirates in Oceana. Her latest success came in late July, when she found **KIWI** on 15049 kHz between 1305-1315 UTC. KIWI also uses 5850 kHz, so both frequencies are worth a check. Gigi hears from the station that they have been buried by a massive volume of reception reports and correspondence, so they ask for patience from listeners. If you're lucky enough to log them, try P.O. Box 1437, Hastings, New Zealand.

Another old friend, David Gasque of Orangeburg, SC, reports that Europirate **DLR-106** still gets out to this side of the Atlantic, even during the summer. Dave recently heard their program of early 70s pop and rock music on 6226.2 kHz at 0045 kHz. Europirate signals should be improving as we enter the fall propagation season.

What We Are Hearing

We all should remember that Halloween is traditionally one of the biggest holidays of the year for North American pirate activity. Since it falls on a Sunday this year, Halloween weekend would be an **excellent** time to check out the pirate bands.

Stations reported this month use the following addresses for reception reports: P.O. Box

Tim Rahto's voice from WLIS.

452, Wellsville, NY 14895; P.O. Box 109, Blue Ridge Summit, PA 17214; P.O. Box 146, Stoneham, MA 02180; P.O. Box 604, Huntsville, AL 35804; and P.O. Box 293, Merlin, Ontario N0P 1W0. Frequencies are in kHz, with times in UTC:

Altered States Radio- 7413 at 0230. Head honcho William Hurt of this rock and comedy station offers a collector's series of "Dead Rock Star" QSL verifications. Addr: Merlin. (Direct from the station)
Down East Radio- 7465 at 0115. Oscar Guggins, a friendly announcer with a thick New England accent, blends rock and comedy bits during his productions. Addr: Blue Ridge Summit. (Richard T. Pistek, Wellsville, NY)
Hello Radio- 7415 at 0200. This jammer is hardly worth classifying as a station. Its programming still consists of nothing but drawn out and shouted station identifications. Addr: None. (Tim Rahto, Baltimore, MD)
KMCR- 15050 at 2000. Magic Mike of **Magic Carpet Radio** says that he has been testing up here on 19 meters. Several stations have been trying for long distance signal coverage on this band, so the frequency is worth a check during the daytime. Addr: Blue Ridge Summit. (Direct from the station)
K-2000- 7415 at 0245. Here's a new station with an eclectic program mix. It features clever ad spoofs, a parody of Glenn Hauser's "World of Radio," and mock civil defense tests. Addr: Stoneham. (Gasque, Rahto)
North American Pirate Relay Service- 7465 at 0100. Richard T. Pistek has joined a parade of pirates who have shifted frequencies to avoid the interference mess around 7415 kHz. He relays many other stations, but also airs his own shows. Addr: Wellsville. (Direct from the station)
North Jersey Coast Radio- 7465 at 0115. This rock station was recently active on a local Thursday evening. Most pirates broadcast on weekends, but there are exceptions like this one. Addr: Wellsville. (George Zeller, Cleveland, OH)
Omega Radio- 7414 at 0000. Dick Tator's religious programs sometimes include Christian rap music. I have to admit that until I heard Dick's show, I didn't realize that some rap music uses religious themes. Addr: Wellsville. (Zeller)
Radio Airplane-7465 at 0300. Pirate Captain Eddy often moves the frequency of his flying transmitter up to the area around 7475 kHz. He promotes other pirates during his shows. Addr: Wellsville. (Michael Prindle, New Suffolk, NY; Max Syko, Gaylord, MI; Lytle)
Radio Esoterica- 7417 at 2200. Moriarty says that he received dozens of reports for relays via Europirate **Radio Stella International.** In exchange, Esoterica plans to relay some European stations in North America. Note the station's elaborate new QSL that we picture this month. Addr: Stoneham. (Direct from the station)
Radio USA- 7415 at 0115. Mr. Blue Sky's veteran (and genuine) station still appears regularly with a well produced blend of punk rock and biting comedy. Addr: Wellsville. (Prindle)
Radio USA (fake version)- 7415 at 1315. The irrational screeds from this imposter sometimes appear in the morning. At least his production standards are improving. Addr: None valid. (Gasque)
Solid Rock Radio- 7415 at 0230. This new one has been widely heard with rock and rap music, sometimes followed up by attempts to converse with other pirates. Addr: Wellsville. (Rahto)
Voice of Laryngitis- 7416 at 2230. The Huxleys have returned with several transmissions of their hilarious new "Nightmare on 41 Meters" program. Pirate buster J. Eager Heaver from the FCC chases the "Voice of the Nit" (sic, see below). Addr: Wellsville. (Direct from the station)
Voice of the Night-No times or frequencies. After constant mayhem last year, Lad's station has been silent throughout 1993. Widespread rumors of an FCC bust remain officially unconfirmed, despite printed reports from computer bulletin boards that ran in the Miami Valley DX Club bulletin. Addr: Wellsville no longer valid. (Kirk Baxter, Mission, KS; Richard D'Angelo, Wyomissing, PA)
WCYC- 7415 at 0145. The "World's Craziest Young Children" still feature hip-hop, rock, and rap music. They sometimes announce a telephone number for live talk shows. Addr: Blue Ridge Summit. (Rahto, Prindle, Gasque)
WEED- 7465 at 0200. The gravel-voiced announcer on this consistently active station hosts a well produced mixture of rock, drug advocacy, and comedy. The fast paced programs are generally entertaining. Addr: Huntsville. (Lytle, Prindle, Gasque)
Wire Line Radio-7415 at 0300. They have settled into a regular format of rock music and comedy sketches, which is very common among North American pirates. Addr: Blue Ridge Summit. (Prindle, Rahto)
WJAM- 7416 at 0200. Many speculate that this one probably is an alternate call sign for WKIK. Its drifty transmitter features rock music shows and relays of licensed broadcasters in the Jacksonville, FL area. Addr: Wellsville, but not guaranteed. (Gasque)
WLIS- 7413 at 0230. Jack Boggin still hosts one of the most unusual formats on radio. He plays actual "hit" interval signals of the 70's, 80's, and 90's from licensed shortwave broadcasters. As we see here, he has another new one in a regular series of QSLs. Addr: Blue Ridge Summit. (Rahto, Prindle)

The elaborate new Radio Esoterica QSL.

MT

Bob Evans

POCSAG, GOLAY and ACARS

No, this isn't the name of *Monitoring Times'* corporate law firm; rather, these are three VHF digital transmission modes that up until quite recently have been beyond the scope of the hobby monitor. With the introduction of the Universal M-400 decoder and M-1200 circuit board for your PC, however, a new world of VHF digital transmissions has been opened.

POCSAG and **GOLAY** are two commonly used pager communication modes. Several channels can be found in the VHF spectrum around 140, 400 and 800 MHz. If you have one of the older pager models that only makes a beep sound or can display a short alphanumeric message such as a phone number, chances are that your pager company is communicating with you using POCSAG. Newer pagers, that provide unlimited alphanumeric text reception, utilize the GOLAY mode. Just to confuse matters, pager companies transmit messages in multiple modes on one VHF channel. For example, the combined use of GOLAY, POCSAG and DTMF ("touch tones") signaling on one channel is very common. While cellular telephone users are now generally aware that their calls can be monitored, even though it is illegal to do so, GOLAY users have yet to make this discovery. Trials with a prototype of the decoder in the Washington, DC, area produced some interesting government traffic.

ACARS is the acronym for **Aircraft Communications Addressing and Reporting System**. This system is an air/ground network which enables aircraft to function as mobile computer terminals linked to a ground-based command and control management system. Information collected from sensors onboard ACARS-equipped aircraft is automatically transferred by VHF radio link to ACARS ground facilities. It is then relayed via the ground stations to a central computer processor where the data is converted into inter-airline operational messages through the ARINC ESS (Electronic Switching System). Over 8 million ACARS messages are currently processed in any given month.

ACARS was initially intended to be used in a line-of-sight VHF band radio environment. Since its inception, both HF (shortwave) and satellite transmissions have been used experimentally. Depending on VHF propagation conditions, line-of-sight for high altitude aircraft can be as much as 350 miles or more.

ACARS transmissions can be found on the following channels in the AM VHF Aircraft Band.

131.550 MHz	The initial implementation and primary channel for ACARS in the United States and Canada
130.025 MHz	Secondary ACARS channel for busy areas of the United States
129.125 MHz	Tertiary ACARS channel for some busy areas of the United States
131.475 MHz	The proprietary company channel for Air Canada
131.725 MHz	The primary channel used for ACARS in Europe

What Can You Monitor?

For most ACARS monitors (except those living within close proximity to a major airport), transmissions from the aircraft's Airborne Subsystem are audible only when the aircraft is actually airborne. Generally these transmissions fall into one of two broad categories:

1. ACARS traffic occurring immediately after departure or prior to landing.
2. ACARS traffic from high altitude flights crossing a Center's Flight Information Region.

ACARS traffic includes arrival and departure information, weather reports, pre-departure clearances, flight plan information, winds aloft, weight and balance information, engine data and fuel consumption, position reports, delays, personal messages, aircraft maintenance status and faults, plus much more.

In addition to scanning the voice frequencies for Approach and Departure of your local airport, you may also wish to scan your local Air Traffic Control Center's voice frequencies for aircraft flying through their zone. (You must have two VHF receivers to decode and monitor simultaneously.)

You may also optionally scan the frequencies of distant ATC VHF facilities. For example, from my location in Toronto, ACARS transmissions have been monitored from flights departing from and arriving at New York, Chicago, Cleveland, Detroit, Buffalo, Rochester, etc. Scanning the New York ATC voice frequencies often turns up an aircraft that appeared on the ACARS net.

The general rule of thumb regarding distant ACARS transmissions is that if VHF voice transmissions can be heard from your location, you will also be able to receive ACARS traffic from the same location. Living in close proximity to the busiest international airport in Canada, I have observed that roughly 50% of the traffic monitored has been from distant aircraft. This bodes well for ACARS monitors who do not live anywhere near a major airport. ACARS transmissions from aircraft on the ground will not generally be audible unless you live within sight of a major airport. The same holds true for ground-based ACARS stations.

A number of U.S. based carriers are ACARS-equipped. Those monitored to-date include: United, Northwest, American, Continental, Trans World, U.S. Air, Piedmont, Allegheny and Delta. Other international carriers include: Air Canada, Canadian, Air France, British Airways, KLM, Lufthansa, Caledonian, TACA Int'l1, Japan Airlines, QANTAS, Air New Zealand, Swiss Air, China Airlines and All Nipon Airways. You'll also find UPS and other cargo carriers on the ACARS channels as well as a myriad of business jets.

What Equipment Do You Need?

To monitor ACARS transmissions requires a VHF receiver capable of tuning the AM aircraft band (118.00 MHz to 136.00 MHz). A suitable VHF antenna is also needed. While table-top scanner/receivers are preferred, they certainly are not necessary. Finally, you'll need the decoder, or the decoder board for your PC.

ACARS decoding and the concept of "scanning" are mutually exclusive. Because ACARS transmissions are split-second in nature (at 2400 baud), the squelch control on your radio must be turned completely off. Otherwise the transmission will be half over before the squelch circuit opens.

PacTOR and CLOVER II

Two of the newer amateur radio HF transmission modes were not cited in the summary provided in the last column. PacTOR and CLOVER II were developed to address the problems inherent with HF digital transmissions, namely: high variability of path loss, narrow-band selective fading, frequent impulse noise and heavy frequency congestion.

The PacTOR system deals with the HF channel by processing the incoming analog information and making a lot of educated decisions before asking for a retransmission. PacTOR utilizes 256 decision points from an analog to digital converter, inverts the synch header from packet to packet to aid in merging packets, merges packets in memory by selecting bits with stronger decisions (near 0 or 256) and rejects weaker decision bits (nearer 128).

PacTOR features positive QRT confirmed at both stations, independent mark and space, unique call address, full "read along" with other stations and a robust 12 bit acknowledgment. PacTOR is an adaptive protocol; at 200 baud, it uses 192 bits; at 100 baud, it uses 80. The 12 bit acknowledgment signals perform normal ACK functions as well as change the direction of the transmission and request speed changes. Like regular amateur radio RTTY, PacTOR uses a 170 Hz shift.

CLOVER II takes a differing approach to HF channel usage. It makes use of four tones that are 125 Hz apart, and phases and amplitude modulates these tones. CLOVER II uses Reed-Solomon error correction, has simultaneous data flow in both directions and is an adaptive protocol with up to 8 modes.

CLOVER II throughput can vary from 19.85 BPS (Bits Per Second) to 750 BPS depending on propagation conditions and the mode in use. As conditions change, the CLOVER II modems change modes and speeds.

How much of an improvement do these newer modes provide? At the January AMRAD meeting, Larry Walker, K4LLQ, demonstrated the following results. Under poor conditions, HF Packet provides zero characters per second (it dies). AMTOR (aka SITOR) provides 3 ch/sec. PacTOR at 100 baud delivers 5 ch/sec and 11.05 ch/sec at 200 baud. CLOVER II continuously delivers 10 ch/sec under extremely poor conditions. (Information on PacTOR and CLOVER II courtesy of Randy Mays, WA6VFC)

Flightlink — Super Mario at 35,000 Feet

In-Flight Phone recently announced a new Flightlink telephone/data service for passengers on trans-Atlantic flights. Based in Iceland, the system will work in tandem with ground stations in the United States, Canada, Greenland and Europe. Each day, more than 150 flights currently traverse the area within the range of the new ground station. The Flightlink solution is preferable because of lower cost associated with a land-based air-to-ground communications service as opposed to direct aircraft-to-satellite links.

Flightlink consists of a telephone handset and LCD viewing screen installed in the passenger seatback. In addition to digital clear telephone service, the handset also lets passengers send FAX messages, receive stock quotes and even play video games. Approximately 400 commercial aircraft are expected to be fitted with Flightlink by the end of 1994.

From Apples to Newtons

Users of Apple Computer's Powerbook and PowerBook Duo laptop systems can now send and receive electronic mail messages without a telephone modem using RadioMail Corp.'s wireless e-mail service. In addition to e-mail, PowerBook users can access RadioMail NewsFactory, the first wireless service for on-demand delivery of news and financial information.

Users can connect to RadioMail through an Ericsson GE Mobidem or a Motorola InfoTAC packet radio modem. For a $99.00 set-up fee, customers receive a diskette and instructions on installing the application. The wireless e-mail service is priced at $89.00 per month, with the first month free to new subscribers. The Eudora software (electronic mail application) is priced at $49.00, with a $25.00 credit on the first month's invoice.

While PowerBooks continue to be rather pricey, Apple recently announced its handheld personal organizer - the Newton. Priced at around $500.00, this unit will also feature wireless e-mail, FAX, pager, as well as voice telephone circuit communications. The unit can transmit and receive data from other Newtons or computers via an infrared light data beam.

Add a Little Diversity to Your Monitoring

A common technique used by many professional monitoring facilities is diversity reception. This technique makes use of two or more radio receivers connected to antennas with different orientation. The Infotech/ Universal line of decoders provide for two audio inputs and selection of either input or both in diversity mode. If you have one these decoders and two shortwave receivers, all you need to do is connect two differently oriented antennas to your radios. For example, if radio #1's antenna is oriented North/South, connect an East/West antenna to radio #2. If you don't have a second receiver, don't despair. You can also sample diversity reception by connecting the two antennas to your single radio. Diversity techniques are often used to combat selective fading on HF channels.

Reference Sources

The most often asked question from new digital mode listeners usually is *"Where can I get a book that lists all the frequencies, stations and modes?"* Unfortunately, at the moment there is no one publication that has it all. Current sources available include the following with their inherent strengths and shortcomings.

1. *Guide to Utility Stations* by Klingenfuss — an expensive annual publication with updates available by subscription, more suited to the advanced listener, but missing many commonly heard North American stations. Other Klingenfuss publications include the *Guide to Fax Stations* and the *Air and Meteo Code Manual.* If your interests lie in these areas, these are the only publications available and are highly recommended.
2. *Confidential Frequency List* by Halligey — out of date with respect to RTTY and missing all the newer transmission modes.
3. *Guide to Utilities* by Poly Verlag, Switzerland — often covers what is missing in Klingenfuss, introductory text in German only, but loggings in English; expensive and virtually unknown and unmarketed outside of Europe.
4. Utility Column, *Monitoring Times* by Larry Van Horn — an increasing number of digital mode logs have been reported in Larry's column on a monthly basis. And, of course, the Digital Digest columnon a quarterly basis.
5. RTTY Column, *Popular Communications* magazine, by Robert Margolis — informative monthly column with lots of loggings — runs four to seven pages per issue.
6. *The RTTY Listener*, a special edition compilation of Universal Radio's customer newsletters published in book format.
7. The RTTY and Utility columns found in the major shortwave club publications. These loggings often are more relevant to your own listening area.
8. We've saved the best for last. The all new *Grove Shortwave Directory*, edited by Larry Van Horn, should be available sometime in October of this year. In addition to containing a wealth of utility voice information, Larry informs me that there's a myriad of material for the digital monitor as well. Those of you who registered for the MT Convention before June 30th will receive a free copy! See you there!

MT

the qsl report

Gayle Van Horn

It's finally arrived! DX season is here! So long, summer static! Australia's CAAMA Radio (Central Australian Aboriginal Media Association), broadcasting from the Northern Territory, offers listeners a chance to hear a local side of Australia from the outback.

Check out this month's Shortwave Guide beginning at 0100 UTC, to hear CAAMA's VL8A, VL8K and VL8T stations. CAAMA is an excellent verifier. Include 3 IRCs to; CAAMA Radio-ABC, Central Australian Aboriginal Media Assoc., P.O. Box 2924, Alice Springs, NT 5740 Australia.

• "I wouldn't be able to DX without it!" So says number one son in the Van Horn household. If AM/FM DXing is your passion, you need the 1992/93 Fourth Edition of *M Street Radio Directory*. Within the 690 pages are stations by call letters, frequency, and station addresses. Program formats, codes, and industry rankings are included, too. Canadian station listings have been expanded to list call letters, frequencies and markets.

Available through Grove Enterprises (BOK-53), *M Street Radio Directory* provides the most accurate and comprehensive industry data in its field.

ALGERIA

Boufarik Radio 7TF, 6415 kHz. Full data prepared card, signed by "Signe"-Le Chef de Centre. Received for an English utility report, 1 IRC and an address label (used). Station address: Station Boufarik Radio, Station Radiomaritime, Atten: Le Chef de Centre, Boite Postal 234, 09400 Boufarik, Algeria. (Mike Hardester, Jacksonville, NC)

ARMENIA

Radio Yerevan, 11675 kHz. Partial data QSL card, without veri signer. Souvenir postcard and program schedule included. Received in 336 days for an English report and one U.S. dollar. Station address: Alek Manoukian St., Yerevan 25 Armenia. (Doug Merkel, St. Louis, MO)

AUSTRIA

Radio Austria Intl, 6015 kHz. Full data QSL letter initialed by "BJ". Received in 30 days for an English report and mint stamps. Station address: A-1136. Vienna, Austria. (Michael J. Mc Ferrin, Brights Grove, Ontario, Canada)

CANADA

Canadian Forces Radio, 6150 kHz. Full data 1983 RCI card. "Verified" stamp features RCI's 40th Anniversary 1985, signed by Bill Westhaven. RCI stickers, pennant and old RCI logo card. Received in 14 days for an English report and two photos. Station address: P.O. Box 6000, Montreal, Canada H3C 3A8. (Charles Montgomery, Cheyenne, WY)

COLOMBIA

Radio Nueva Vida, 5567 kHz. Returned full data prepared QSL card, signed by Christian Caicedo Aguiar. Souvenir postcard and personal letter included. Received in 633 days for a Spanish report and mint stamps. A follow-up report via registered air, was returned as unclaimed. Friendly letter indicating that Radio Nueva Vida "transmite en la frecuencia de 5.567 kHz todos los dias." Station slogan is: "Anunciando las Buenas de Salvacion." Power is 100 watts. Address on letterhead is: P.O. Box 402, Cucuta, Colombia; the address on the envelope is given as Calle 7 No. 9-25, Tibu N.S., Colombia. (Hardester, NC)

CYPRUS

BBC Relay Station, 15575 kHz. Full data transmitter site card, without veri signer. Received in 3 weeks for an English report and 2 IRCs. Station address: c/o BBC Mediterranean Relay Station, P.O. Box 4912, Limassol, Cyprus. (Ed Rausch, Cedar Grove, NJ)

HUNGARY

Radio Budapest, 11910 kHz. Full data QSL card without veri signer. Souvenir pennant included. Received in 29 days for an English report. Station address: Brody Sandor utca 5-7, H-1800 Budapest, Hungary. (Merkel, MO)

MEXICO

Radio Educacion-XEPPM, 6185 kHz. Date only card of "Modern fountain on Reforma Avenue," signed by Lic. Luis Ernesto Pi Orozco-Director General. Program/station guide included. Received in 135 days for a Spanish report, one U.S. dollar and address label (not used). Station address: Angel Urraza 622, Col. Del Valle, Mexico, D.F. 03100. (Hardester, NC)

NETHERLANDS ANTILLES

Trans World Radio, 11930 kHz. Full data QSL folder card signed by Sally Rork. Station stickers, brochures, medium wave schedule, and a personal letter from Ms. Rork. Received in 23 days for an English report and 3 IRCs. Station address: Bonaire, Netherlands Antilles. (Steven Cline, Indianapolis, IN)

PAKISTAN

Radio Pakistan, 9418/11570/15550 kHz. Full data letter, signed by Asyed Abrar Hussain-Senior Broadcast Engineer. Received in 5 months for an English report and two follow-ups with mint stamps. Station address: Pakistan Broadcasting Corp., Broadcasting House, Constitution Avenue, Islamabad, Pakistan. (Rausch, NJ)

SPAIN

Radio Exterior de Espana, 9530 kHz. Full data QSL card with illegible signature. Station stickers and program schedule included. Received in 374/153 days for an English report. Station address: Apartado 156.202-28080 Madrid. (McFerrin, Canada) (Ernest T. Bagley, South Portland, ME)

SWAZILAND

Trans World Radio, 11740 kHz. Full data station card, signed by Carol J. Tatlow. Station info sheet and program schedule included. Received in 142 days for an English report, one U.S. dollar, and souvenir postcards. Station address: P.O. Box 64, Manzini, Swaziland. (Harold Frodge, Midland, MI)

SWITZERLAND

Swiss Radio Intl, 9885 kHz. Full data QSL card without veri signer. Received in 51 days for an English report. Station address: Giacomettistr, 1, 3000 Bern 15, Switzerland. (Montgomery, WY)

TAIWAN

Taipei Marine Radio BVA, 17281 kHz. Full data prepared personal letter signed by J.C. Mong-Managing Director. Received in 1.5 months for an English utility report and mint stamps. Station address: c/o Long Distance Telecommunications Administration, No 52 Ching-Shan S. Road Section 2, Taipei 106 Taiwan, Republic of China. (Rausch, NJ)

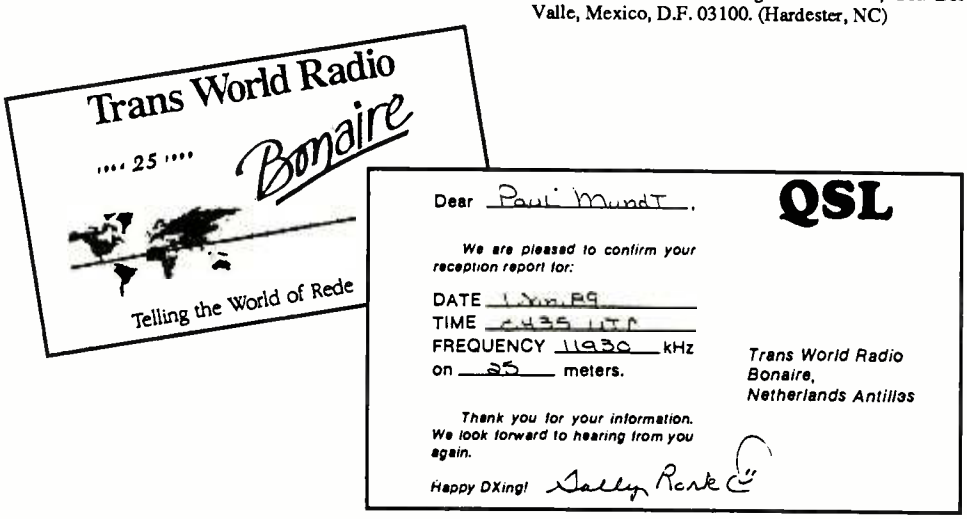
UNITED STATES

WKNR 1220-AM Cleveland, OH. Full data logo card signed by John R. Hovanec. Received in 993 days for a 1990 AM report. This is the second card received for this report, first one was in 39 days. Station address: 9446 Broadview Rd., Cleveland, OH 44147-2397 (Frodge, MI)

WFIN 1330-AM Findlay, OH. Full data logo/map QSL sheet, signed by Dennis Rund. Received in 14 days for an AM report and an SASE. Station address 101 W. Sandusky St., OH 45840. (Frodge. MI)

WKNR 1220-AM Broadview Hts, OH. Full data QSL card, signed by John Hovanec. Received after two years of reminders to print up some QSL cards! Station address: 9446 Broadview Road, Broadview Hts, OH 44147-2397. (Holbrook, MD)

WMIZ 1270-AM Vineland, NJ. Full data prepared QSL card, signed by Dave Schmidt-Manager. Received in one month for an AM report and mint postage. Station address: 638 Landis Ave., Vineland, NJ 08360. (Holbrook, MD)



Trans World Radio, which ceased shortwave broadcasts from this site this past summer, sent this QSL to Paul Mundt of Lombard, IL.

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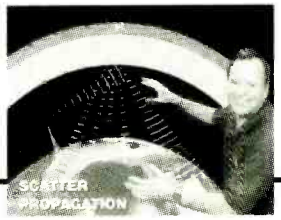

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How to Use the Shortwave Guide

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 Saving 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	T: Tuesday	H: Thursday	A: Saturday
M: Monday	W: Wednesday	F: Friday	

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.

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising 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	as:	Asia
na:	North America	au:	Australia
ca:	Central America	pa:	Pacific
sa:	South America	va:	various
eu:	Europe	do:	domestic broadcast
af:	Africa	om:	omnidirectional
me:	Middle East		

Consult the propagation charts. To further help you 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.

Hot News and Hot Spots

The "hottest" news is probably the word that the Christian Science Church is putting its Maine outlet, WCSN, up for sale. See Hauser's column on p. 30 for more details on this latest development.

Mother Nature has also been making things for some of the shortwave broadcasters, as seen in the following two reports.

The first is from Alfred Cotroneo, President of NEXUS-International Broadcasting Association, which operates IRRS-Shortwave. The relay service was off the air for five days in August "after a severe thunderstorm hit the area surrounding Milano. As our engineers found out, the lightning directly hit our power lines, started a small fire inside the transmitter, which in turn caused considerable damage to the electronic circuitry and internal cabling."

"This was the second episode in just about 60 days, and not the first in the four years of regular operations on shortwave. It must be worth noting, however, that such damages can hardly be avoided when lightning hits directly. The favorable position of the transmitting location and extremely good ground conductivity, which makes our transmissions so effective despite our low power, also make our equipment more vulnerable to summer lightning."

IRRS-shortwave says it is celebrating its return to the air by continuing the Mon-Fri transmissions at 1200-2130 UTC in addition to the regular scheduling on 7125 kHz, and they promise new non-religious programming coming soon.

Also in August was a massive earthquake, measuring 8.2 on the Richter scale, which struck the island of Guam. It was the worst quake to hit the island in the 84 years since records began. In his report to *Monitoring Times*, Dr. Adrian Peterson paints a picture of the situation.

"In the area are five international shortwave stations, all of them owned and operated by religious organizations. The two shortwave stations located on Guam were closest to the epicenter of the earthquake. Even so, damage was quite minimal.

"Station KTWR is part of the Trans World Radio Network of evangelical stations. Their facility contains four transmitters and an antenna farm containing five curtains. The only damage reported here was to one studio. However, because power went out in the area, they were on a reduced schedule for a couple of days, using their emergency generator."

"The other station on Guam is KSDA, which is part of the international network of Adventist World Radio and operates as AWR-Asia. This station contains two transmitters and four large curtain antennas. The only damage sustained at this station was to one section of their main building, and to one feeder line, putting one antenna and one transmitter off the air for about seven hours. This station also went to emergency power."

"In order to let the outside world know what was happening on Guam, the Program Director, Gregg Scott, presented a 2 minute news bulletin at the top of each hour, superimposed over the programming in progress. Meanwhile, four members of the staff concentrated on picking up and sorting several thousand tapes strewn over the floor.

"To the north of Guam is the island of Saipan, about a half hour distant by plane. On this island are two more shortwave stations. These are KFBS which is owned by the Far East Broadcasting Company of Manila in the Philippines and KHBI which is the Pacific relay for the Christian Science network. Station KFBS operates four transmitters with three antennas, and KHBI operates two transmitters and four antennas.

"Even though the earthquake was centered somewhat between the two islands of Guam and Saipan, both KFBS and KHBI indicate that there was no damage to their facilities. "

Dr. Peterson reported that KHBN, owned by High Adventure Ministries in California and located on the lonely island of Palau, was so far from the epicenter that it experienced no damage.

English language **shortwave guide**

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

November Deadline: Sept. 30

Jim Frimmel, Program Manager
Texas

Dave Datko
California

B.W. Battin
New Mexico

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

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 ("Newsdesk")
CBC, Northern Quebec [S]
China Radio Int'l
Christian Science Monitor
Radio Australia
Radio Canada Int'l [S-M]
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l
Radio Norway Int'l [M]
Radio Prague
Radio Thailand
Radio Vilnius
SBC Radio 1, Singapore
Spanish National Radio
Swiss Radio Int'l
Voice of America
WYFR (Network) [T-S]
0005
Radio Pyongyang
0010
China Radio Int'l*
0030
All India Radio
Christian Science Monitor (as) [M]
Christian Science Monitor [T-F]
FEBC Radio Int'l, Philippines
HCJB
Radio Havana Cuba [T-S]
Radio Moscow
Radio Netherlands
Radio New Zealand Int'l [M-F]
Radio Vlaanderen Int'l
Voice of America (am,as) (Special English) [T-S]
Voice of America (as) (Special English) [M]
0035
All India Radio (News Service)
0055
WRNO [H, A]

0100 UTC
(9:00 PM EDT, 6:00 PM PDT)
BBC
CBC, Northern Quebec
Christian Science Monitor
Croatian Radio, Zagreb [M-A]
Deutsche Welle
FEBC Radio Int'l, Philippines
Radio Australia
Radio Bulgaria
Radio Havana Cuba [T-S]
Radio Japan
Radio Korea
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Norway Int'l [M]
Radio Prague
Radio Slovakia Int'l
Radio Tashkent
Radio Thailand
Radio Ukraine Int'l
Radiotelevisione Italiana
RAE, Buenos Aires [T-A]
SBC Radio 1, Singapore
Spanish National Radio
Voice of America
Voice of Indonesia
0115
Radio Havana Cuba* [T-S]
0130
Christian Science Monitor (as) [M]
Christian Science Monitor [T-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Bangladesh
Radio Havana Cuba [T-S]
Radio Moscow
Radio Netherlands
Radio Tirana
Radio Yugoslavia
Voice of Greece
0155
Radio Korea [T-A]
Voice of Indonesia
WRNO [W, A]

0200 UTC
(10:00 PM EDT, 7:00 PM PDT)
BBC ("Newsdesk")
CBC, Northern Quebec [S-M]
Channel Africa, Johannesburg
Christian Science Monitor
Croatian Radio, Zagreb [S]
Deutsche Welle
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Norway Int'l [M]
Radio Romania Int'l
Radio Thailand
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Free China
Voice of Myanmar
0215
Radio Cairo
Radio Nepal
Voice of Kenya
0230
Christian Science Monitor (af,me) [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
Radio Yugoslavia
SLBC, Sri Lanka
0245
All India Radio (News Service)
Radio Finland [M-A]

0300 UTC
(11:00 PM EDT, 8:00 PM PDT)
BBC
CBC, Northern Quebec [T-S]
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Budapest
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio Prague
Radio Thailand
SBC Radio 1, Singapore
Voice of America
Voice of Free China
Voice of Kenya
WWCR [T-A]
0305
Radio Bangladesh
0309
BBC*
0310
China Radio Int'l*
0315
Radio Cairo
Radio Havana Cuba* [T-S]
0330
BBC (af)*
Christian Science Monitor (af,me) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l [T-A]
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Moscow
Radio Netherlands
UAE Radio, Dubai
Voice of Greece
0345
Radio Yerevan
0355
Radio Japan [M-F]

0400 UTC
(12:00 AM EDT, 9:00 PM PDT)
BBC
CBC, Northern Quebec
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Bulgaria
Radio Havana Cuba [T-S]
Radio Moscow
Radio Norway Int'l [M]
Radio Prague
Radio Romania Int'l
Radio Tanzania
Radio Thailand
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Kenya
Voice of Turkey
WWCR [T-A]
ZNBC Radio 2, Lusaka
0402
Radio Botswana
0405
Radio Pyongyang
0410
China Radio Int'l*
0425
Radiotelevisione Italiana
0430
Christian Science Monitor (af,as) [M]
Christian Science Monitor [T-F]
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Moscow
0445
BBC (af)* [T-F]
0450
Channel Africa, Johannesburg
0455
WYFR (Network) [T-A]

0500 UTC
(1:00 AM EDT, 10:00 PM PDT)
BBC ("Newshour")
CBC, Northern Quebec [T-S]
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
Deutsche Welle
HCJB
Kol Israel
NBC, Windhoek
Radio Australia
Radio Bahrain
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Japan
Radio Lesotho
Radio Moscow
Radio New Zealand Int'l* [M-F]
Radio Thailand
SBC Radio 1, Singapore
Spanish National Radio
Voice of America
Voice of Kenya
WRNO [F]
ZNBC Radio, Lusaka
0510
China Radio Int'l*
Radio Botswana [M-A]
0515
Radio Havana Cuba* [T-S]
0520
Radio For Peace Int'l [T-A]
0530
Christian Science Monitor (af,as) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Finland [M-A]
Radio Havana Cuba [T-S]
Radio Moscow
Radio Romania Int'l
Radio Thailand
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
0545
Voice of Nigeria*

0600 UTC
(2:00 AM EDT, 11:00 PM PDT)
BBC
BBC (af)* [A-S]
CBC, Northern Quebec
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle
GBC Radio, Accra*
Radio Australia
Radio Bahrain
Radio Canada Int'l [M-F]
Radio Havana Cuba [T-S]
Radio Korea
Radio Moscow
Radio New Zealand Int'l
Radio Nigeria
Radio Prague
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Kenya
Voice of Malaysia
ZNBC Radio, Lusaka [M-A]
0605
Radio Pyongyang
0609
BBC*
0627
BBC (af)* [M-F]
0630
Christian Science Monitor [M-F]
Radio Austria Int'l [T-A]
Radio Havana Cuba [T-S]
Radio Moscow
Radio Romania Int'l
RTV Congolaise, Brazzaville [M-F]

newsline

Voice of Nigeria
0645
Radio Romania Int'l
Voice of Nigeria*
0650
Radio New Zealand Int'l* [M-F]
0655
Radio Korea [M-F]

0700 UTC
(3:00 AM EDT, 12:00 AM PDT)
BBC ("Newsdesk")
Christian Science Monitor
GBC Radio, Accra
LBS, Monrovia
MBC, Blantyre [M-A]
Radio Australia
Radio Bangladesh
Radio Japan
Radio Korea
Radio Liberia
Radio Moscow
Radio New Zealand Int'l* [M-F]
Radio Nigeria, Ibadan
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Free China
Voice of Kenya
Voice of Myanmar
0703
Croatian Radio, Zagreb [M-A]
0705
Radio Pyongyang
0730
All India Radio (News Service)
BBC (af)* [A]
Christian Science Monitor [M-F]
HCJB
Radio Austria Int'l
Radio Ghana
Radio Moscow
Radio Netherlands
Radio Prague
Radio Vlaanderen Int'l
0745
Radio Finland [M-A]
0750
Radio For Peace Int'l [T-A]
0755
Radio Japan [M-F]
Radio Korea [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 [S]
Radio Australia
Radio Bahrain
Radio Korea
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Pakistan
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Indonesia
Voice of Kenya
Voice of Malaysia
ZNBC Radio 2, Lusaka [M-A]
0802
Radio Botswana
0803
Croatian Radio, Zagreb [S]
0805
Radio Pyongyang
0830
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Moscow
Radio Netherlands
Radio Slovakia Int'l
0840
Voice of Greece [M-A]
0850
All India Radio (News Service) (Special English)
Radio Pacific Ocean [A]
0855
Radio Korea [M-F]
Voice of Indonesia

0900 UTC
(5:00 AM EDT, 2:00 AM PDT)
BBC
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 1, Accra [M-F]
GBC Radio 2, Accra
LBS, Monrovia
MBC, Blantyre M-A]
Radio Australia
Radio Bahrain
Radio Finland [M-A]
Radio Japan
Radio Liberia
Radio Moscow
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of Kenya
0903
Croatian Radio, Zagreb [M-A]
0910
China Radio Int'l*
0930
All India Radio (News Service)
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Afghanistan
Radio Moscow
Radio Netherlands
0940
Radio Togo
0945
Deutsche Welle (af)* [M-F]
Radio Yerevan [S]
0955
Radio Japan [M-F]

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)
All India Radio
BBC
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
GBC Radio 2, Accra [A]
HCJB
MBC, Blantyre [S]
Radio Australia
Radio Bahrain
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Tanzania
Radio Vlaanderen Int'l [M-A]
SBC Radio 1, Singapore
Voice of America
Voice of Kenya
ZNBC Radio 2, Lusaka [M-A]
1003
Croatian Radio, Zagreb [S]
1005
Radio New Zealand Int'l* [M-F]
1010
China Radio Int'l*
1030
Christian Science Monitor [M-F]
MBC, Blantyre [M-F]
Radio Austria Int'l [M-F]
Radio Moscow
Radio New Zealand Int'l* [M-F]
Radio Prague
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
1040
Voice of Greece [M-A]
1045
Voice of Nigeria*
1055
All India Radio

1100 UTC
(7:00 AM EDT, 4:00 AM PDT)
BBC ("Newsdesk")
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle
GBC Radio, Accra [A-S]
Kol Israel
MBC, Blantyre [A-S]
Radio Australia
Radio Bahrain
Radio Japan
Radio Moscow
Radio New Zealand Int'l ("Newsdesk")
Radio Nigeria, Ibadan
Radio Pakistan
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Kenya
WYFR (Network) [M-F]
ZNBC Radio, Lusaka
1105
Radio Pakistan (Special English)
Radio Pyongyang
1110
Radio Botswana [M-F]
1115
Radio Nepal
1125
Radio Botswana [A-S]
1130
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Bulgaria
Radio Korea
Radio Lesotho
Radio Moscow
Radio Netherlands
RTM, Malaysia*
WYFR (Network) [M-F]
1135
All India Radio (News Service)
Radio Thailand
1145
Deutsche Welle* [M-F]
1150
Channel Africa, Johannesburg
1155
Radio Japan [M-F]

1200 UTC
(8:00 AM EDT, 5:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
China Radio Int'l
Christian Science Monitor
LBS, Monrovia
MBC, Blantyre [M-F]
Radio Australia
Radio Bahrain
Radio Jordan
Radio Korea
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [H-T]
Radio Nigeria, Ibadan
Radio Norway Int'l [S]
Radio Tashkent
Radio Thailand
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
Voice of America
Voice of Kenya
1210
China Radio Int'l*
1215
HCJB [M-F]
1225
WYFR (Network) [M-F]
1230
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Cairo
Radio Finland [M-F]
Radio France Int'l
Radio Moscow
Radio Netherlands
Radio Vlaanderen Int'l [S]
Radio Yugoslavia
SLBC, Sri Lanka
1235
Voice of Greece
1245
SLBC, Sri Lanka
1255
Radio Bangladesh
Radio Korea [M-F]
1257
HCJB [M-F]
1258
Africa Number One, Libreville

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)
BBC ("Newshour")
CBC, Northern Quebec [A-S]
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Canada Int'l (am) [M-F]
Radio Korea
Radio Moscow
Radio Norway Int'l [S]
Radio Romania Int'l
Radio Tanzania [A-S]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Kenya
WYFR (Network) [M-F]
1303
Croatian Radio, Zagreb
1305
Radio Pyongyang
1310
China Radio Int'l*
1320
Radio For Peace Int'l [T-A]
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 (as)
Radio Finland [M-F]
Radio Moscow
Radio Netherlands
Radio Tashkent
RTM, Malaysia
UAE Radio, Dubai
Voice of America (Special English)
Voice of Turkey
WYFR (Network) [M-F]
1346
All India Radio [A]
1355
Radio Korea [M-F]

1400 UTC
(10:00 AM EDT, 7:00 AM PDT)
BBC
CBC, Northern Quebec
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
Kol Israel [S-H]
LBS, Monrovia
MBC, Blantyre [M-F]
Radio Australia
Radio Bahrain
Radio Canada Int'l (am) [S]
Radio France Int'l
Radio Iraq Int'l
Radio Japan
Radio Jordan
Radio Korea
Radio Liberia
Radio Moscow
Radio Vlaanderen Int'l [M-A]
RTM, Malaysia*
SBC Radio 1, Singapore
Voice of America
Voice of Kenya
WWCR [M-F]
WYFR (Network) [M-F]
ZNBC Radio 2, Lusaka [M-F]
1410
China Radio Int'l*
1415
LBS, Monrovia (Special English)
Radio Nepal
1425
HCJB [M-F]
LBS, Monrovia
1430
All India Radio (News Service)
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Canada Int'l (eu,af,as)
Radio Finland [M-A]
Radio Moscow
Radio Netherlands
Radio Romania Int'l
1440
FEBC Radio Int'l, Philippines* [M-F]
1445
All India Radio
BBC (as) (Special English) [M-F]
Voice of Myanmar
1455
Radio Korea [M-F]

1500 UTC
(11:00 AM EDT, 8:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
Radio Australia
Radio Bahrain
Radio Canada Int'l [S]
Radio Japan
Radio Moscow
Radio Nigeria
Radio Omdurman, Sudan
Radio Prague
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
Voice of Ethiopia
Voice of Kenya

It's Here!

OCTOBER 15, 16, 17
1993 MONITORING TIMES CONVENTION!
ATLANTA AIRPORT HILTON
ATLANTA, GEORGIA

SCHEDULE

Friday, October 15
11:00 am to 5:00 pm
Registration Open
12:00 to 5:00 pm
Exhibits and Listening Post Open
7:00 to 9:15 pm
"Hobby Talk"

Saturday, October 16
8:00 to 11:30 am
Registration Open
9:00 am to 12:30 pm
Exhibits Open and Morning Seminars
12:30 to 3:00 pm
Exhibits Open/Lunch Break

Saturday cont'd
3:00 pm
Exhibits Close
3:00 to 5:15 pm
Afternoon Seminars
7:00 to 9:00 pm
Banquet—Served at table
9:00 pm
Transmitter Bug Hunt

Sunday, October 17
9:00 am to 12:30 pm
Morning Seminars
Convention Closes at 1:00 pm

This three day weekend is full of activities for the radio enthusiast - all for only $50!

- Dozens of exhibitors with the latest equipment and accessories for radio monitoring, including R.L. Drake, Grove Enterprises, ICOM America and Sony.
- Join your fellow monitors at a professional listening post featuring the Grove SDU-100.
- A two hour hobby talk starts the weekend off Friday evening and is hosted by moderator Bob Grove. A panel of experts will discuss the current developments in the hobby.
- Attend any of over 35 seminars covering shortwave and scanner monitoring for the beginner through the advanced listener.
- Saturday evening's banquet will feature guest speaker Carole J. Perry, noted author, teacher and promoter of amateur radio.
- Get your scanner charged and ready for the "Bug Hunt"—a highlight at each convention!
- A swap meet area available Sunday for those attendees with equipment to sell or trade.

Enjoy accommodations at the Atlanta Airport Hilton and receive the special nightly rate of only $69 (save over 50% off the regular $140 per night rate!) which includes the following:

- **Same rate single or double!**
- **Free parking!**
- **Complimentary airport shuttle!**

Call 404-767-9000 or 800-HILTONS to make your room reservation now!

Be sure to mention Monitoring Times when making your reservation to receive the special room rate.

Over $8000 in Door Prizes!
TWO ICOM R7100s!
ICOM R1 EVERY HOUR!
ICOM JACKETS GIVEN AWAY EVERY HALF HOUR!
and more...

Worldcom Action Tape Controller
Drake MS8 Speakers
Grove CVR4 Scanverters
Sangean MS103 Receivers and Speakers
Advanced Computer Control Software Pkg.
Drake R8 Computer Interface Software
OptoElectronics Frequency Counters

Delta Airline Headquarters Tour!
See the communications room and talk to the Director of Delta communications.
Tours will be conducted on Friday afternoon. Sign up at registration desk.

Call 1-800-438-8155 Today!

newsline

WWCR [M-F]
1505
Radio Pyongyang
1510
China Radio Int'l*
1520
Voice of Greece
1525
BBC (af)* [S]
Radio Veritas Asia [T-F]
1530
All India Radio (News Service)
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
FEBA, Seychelles
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Bangladesh
Radio Moscow
Radio Netherlands
Radio Portugal [M-F]
Radio Tirana
Voice of Ethiopia
Voice of Nigeria
WYFR (Network) [M-F]
1540
Radio Veritas Asia [A-M]
Voice of Nigeria*
1550
Radio For Peace Int'l [T-A]
1555
Radio Veritas Asia [A-M]

1600 UTC
(12:00 PM EDT, 9:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
LBS, Monrovia
MBC, Blantyre
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Canada Int'l [S]
Radio France Int'l
Radio Jordan
Radio Korea
Radio Lesotho
Radio Liberia
Radio Moscow
Radio Nigeria
Radio Norway Int'l [S]
Radio Pakistan
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
Voice of Kenya
WYFR (Network) [A]
Yemen Radio
ZNBC Radio 2, Lusaka [M-A]
1609
BBC*
1610
China Radio Int'l*
Radio Botswana [M-F]
1615
Radio Pakistan (Special English)
1620
Radio Estonia [M-F]
1630
Christian Science Monitor [M-F]
HCJB [M-F]
Radio Finland
Radio Moscow
UAE Radio, Dubai
Voice of America (eu) (Special English)
1655
Radio Korea [M-F]

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC
CBC, Northern Quebec [A]
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
GBC Radio 2, Accra
Radio Australia
Radio Bahrain
Radio Japan
Radio Jordan
Radio Moscow
Radio New Zealand Int'l* [M-F]
Radio Nigeria, Kaduna
Radio Norway Int'l [S]
Radio Pakistan
Radio Prague
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
Voice of Kenya
1705
Radio Bangladesh
Radio Pyongyang
1710
China Radio Int'l*
1725
Radio New Zealand Int'l* [M-F]
Radio Surinam Int'l [M-F]
1730
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Canada Int'l (as)
Radio Moscow
Radio Netherlands
Radio Romania Int'l
1740
BBC (af)*
1750
Channel Africa, Johannesburg

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
All India Radio
BBC ("Newsdesk")
CBC, Northern Quebec [A]
Christian Science Monitor
GBC Radio, Accra
Kol Israel
KVOH
MBC, Blantyre
Polish Radio, Warsaw
Radio Afghanistan
Radio Australia
Radio Bahrain
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l* [M-F]
Radio Omdurman, Sudan
Radio Tanzania
RAE, Buenos Aires [M-F]
Voice of America
Voice of Kenya
WWCR [M-F]
ZNBC Radio, Lusaka
1805
Radio New Zealand Int'l* [M-F]
1815
ZNBC Radio 2, Lusaka*
1830
BSKSA, Riyadh
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Bulgaria
Radio Kuwait
Radio Mogadishu
Radio Moscow
Radio Netherlands
Voice of America (Special English)
1835
Radio New Zealand Int'l* [F]
1840
Voice of Greece
1845
BSKSA, Riyadh*
Radio Cote d'Ivoire
Radio Guinea, Conakry
1855
Radio New Zealand Int'l* [M-H]
Radio Omdurman, Sudan
1857
BBC (af)* [M-F]

1900 UTC
(3:00 PM EDT, 12:00 PM PDT)
All India Radio
BBC
CBC, Northern Quebec [M-H]
China Radio Int'l
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
HCJB
KVOH
Radio Australia
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Norway Int'l [S]
Radio Portugal [M-F]
Radio Romania Int'l
Radio Vlaanderen Int'l
SLBS, Freetown
Spanish National Radio
Voice of America
Voice of Kenya
WWCR [M-F]
1903
Voice of Greece
1910
China Radio Int'l*
Radio Botswana
1930
BBC (af)* [S]
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Finland [S-F]
Radio Ghana
Radio Moscow
Radio Netherlands
Radio Slovakia Int'l
Radio Yugoslavia
1935
Radiotelevisione Italiana
1945
Radio Togo
Radio Yerevan

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
BBC
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
Kol Israel
KVOH
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Portugal [M-F]
Radio Prague
Radio Vilnius
SLBS, Freetown
Swiss Radio Int'l
Voice of America
Voice of Indonesia
Voice of Nigeria
ZNBC Radio 2, Lusaka
2002
Radio Botswana
2005
Radio Pyongyang
2010
China Radio Int'l*
Radio New Zealand Int'l* [S-H]
Voice of Nigeria*
2025
Radiotelevisione Italiana
2030
Christian Science Monitor [M-F]
Polish Radio, Warsaw
Radio Korea
Radio Moscow
Radio Nacional de Angola
2045
BSKSA, Riyadh
2055
Voice of Indonesia

2100 UTC
(5:00 PM EDT, 2:00 PM PDT)
All India Radio
BBC ("Newshour")
CBC, Northern Quebec [S-F]
China Radio Int'l
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
KVOH
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio Bulgaria
Radio Havana Cuba [M-A]
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [S-H]
Radio Nigeria
Radio Norway Int'l [S]
Radio Prague
Radio Romania Int'l
SLBS, Freetown
Spanish National Radio
Voice of America
Voice of Kenya
Voice of Turkey
ZNBC Radio 2, Lusaka
2110
China Radio Int'l*
Radio New Zealand Int'l* [S-H]
2120
Radio Cairo
Radio For Peace Int'l [M-F]
2125
Radio Havana Cuba* [M-A]
2130
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Cairo
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Moscow
2145
Radio Korea

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)
All India Radio
BBC
CBC, Northern Quebec [S-F]
China Radio Int'l
Christian Science Monitor
CIQX, Montreal [M-F]
GBC Radio 2, Accra
MBC, Blantyre
Radio Australia
Radio Budapest
Radio Havana Cuba [M-A]
Radio Iraq Int'l
Radio Korea
Radio Moscow
Radio New Zealand Int'l [A-H]
Radio Ukraine Int'l
Radio Vlaanderen Int'l
Radio Yugoslavia
Radiotelevisione Italiana
SBC Radio 1, Singapore
SLBS, Freetown
Swiss Radio Int'l
Voice of America
Voice of Free China
2203
Croatian Radio, Zagreb
2209
BBC*
2210
China Radio Int'l*
2215
Radio Cairo
2225
Radio Havana Cuba* [M-A]
2230
Christian Science Monitor [M-F]
Kol Israel
Radio Finland [S-F]
Radio Havana Cuba [M-A]
Radio Moscow
Radio Vilnius
Voice of America (Special English)
2240
Radio Cairo
Radio Korea [M-F]
Voice of Greece
2245
GBC Radio, Accra
Radio Bulgaria
Radio Yerevan

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
All India Radio
BBC
CBC, Northern Quebec [M-F]
Christian Science Monitor [M-A]
Radio Australia
Radio Canada Int'l
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [A]
Radio Norway Int'l [S]
Radio Tirana
RTM, Malaysia
SBC Radio 1, Singapore
Voice of America
Voice of Turkey
2305
Radio Pyongyang
2320
Radio Thailand
2330
Christian Science Monitor [M-F]
Radio Moscow
Radio Nacional, Bogota [A]
Radio Netherlands
RTM, Malaysia*
2335
Voice of Greece
2345
Radio Yerevan
SLBC, Sri Lanka [M]
2350
Radio For Peace Int'l [M-F]
2355
Radio Japan [M-F]

English language

shortwave guide

0000 UTC [8:00 PM EDT/5:00 PM PDT]

FREQUENCIES

0000-0100	Australia, ABC Brisbane	4920do	9660do		
0000-0100	Australia, ABC Perth	9610do			
0000-0030	Australia, Radio	13605pa	15320pa	15365pa	17750as
		17840as			
0000-0100 vl	Australia, VL8A Alice Spg	4835do			
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T Tent Crk	4910do			
0000-0100	Bulgaria, Radio	11720na	15330na	17825na	
0000-0015	Cambodia, Natl Voice of	11938as			
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, China Radio Intl	9780na	11715na		
0000-0100	Costa Rica, AWR Alajuela	9725ca	11870ca		
0000-0100	Croatian Radio via WHRI	7315na			
0000-0100	Cuba, Radio Havana Cuba	6010na	9815na		
0000-0030	Czech Republic, R Prague	5930na	7345na	9485na	9810na
		11990na	13715na	17535na	
0000-0045	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
0000-0100 vl	Iraq, Radio Iraq Intl	15180am	17940am		
0000-0100	Lebanon, King of Hope	6280me			
0000-0100 mtwhf	Lebanon, Wings of Hope	11530me			
0000-0100 vl	Malaysia, RTM Kota Kinaba	5980do			
0000-0100 vl	Malaysia, RTM Sarawak	4950do	7160do		
0000-0100	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	15120pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0030 m	Norway, Radio Norway Intl	9675na	15165na		
0000-0100 mtwhfa	Palau, KHBN Voice of Hope	11980as			
0000-0100	Philippines, FEBC Manila	15450as			
0000-0100 vl	PNG, Natl BC	4890do			
0000-0100	Russia, Radio Moscow Intl	7205am	7335am	9505am	9530am
		9625am	9765am	9860na	9905am
		11790am	11805as	11810me	11840as
		12050me	13725as	15220as	15280am
		15410am	15425am	15470na	15480me
		15500as	15580as	17570as	17720na
		17850me	17860as	17870as	21625as
0000-0100	Singapore, SBC Radio One	5010do	5052do	11940do	
0000-0100	Spain, Spanish Natl Radio	9525am			
0000-0030	Sweden, Radio	9695am			
0000-0030	Switzerland, Swiss R Intl	6135na	9650na	9885na	12035na
		17730na			
0000-0100	Thailand, Radio	4830as	9655as	11905as	
0000-0100	Ukraine, R Ukraine Intl	6070eu	6090eu	7150eu	7195eu
		7240eu	9500eu	9550eu	9560eu
		9600eu	9640eu	9685na	9860eu
		11720na	15180na	15195am	15580na
0000-0030	United Kingdom,BBC London	5975na	6005sa	6175na	6180eu
		6195as	7325am	9570as	9580as
		9590na	9915am	11750sa	11945as
		11955as	12095na	15070na	15260sa
		15280na	15360pa		
0000-0100	USA, CSMonitor Boston MA	5850na	9850af	13760sa	17555as
0000-0100 sa	USA, CSMonitor Boston MA	17865as			
0000-0100	USA, KCBI Dallas TX	15725am			
0000-0100	USA, KTBN Salt Lk City UT	15590am			
0000-0100	USA, KVOH Los Angeles CA	17775am			
0000-0100	USA, VOA Washington DC	5995ca	6130ca	7215as	7405ca
		9455ca	9770as	9775ca	11580ca
		11695ca	11760as	15120ca	15185as
		15205ca	15290as	17735as	17820as
0000-0100	USA, WEWN Birmingham AL	7425na	15650na		
0000-0100	USA, WINB Red Lion PA	15145eu			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100	USA, WRNO New Orleans LA		7355na		
0000-0100	USA, WWCR Nashville TN	7435va	13845va		
0000-0100	USA, WYFR Okeechobee FL	6085na			
0010-0015	Kirghizia, Kirghiz Radio	6080as			
0030-0100	Australia, Radio	11720pa	11880pa	13605pa	15240pa
		15320pa	15365pa	17750as	17795pa
		17880as	21740pa		
0030-0100	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0030-0100	Iran, VOIRI Tehran	9022am	11790am	15260am	
0030-0100	Netherlands, Radio	9825as	9860as	11655as	11835na
		13700as			
0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0030-0100	United Kingdom,BBC London	5975na	6005sa	6175na	6180eu
		7325am	9580as	9590am	9915am
		11750sa	12095na	15260sa	15310as
		15360pa	21715as		
0030-0100	WHRI Noblesville IN	7315am			

SELECTED PROGRAMS

Sundays

0030 BBC: The John Dunn Show. John Dunn presents a melodic mix of songs old and new.

Mondays

0005 Radio Norway Int'l: Norway Now. See S 1205.

0030 BBC: In Praise Of God. This month's religious services come from St. Martin's In The Fields, London (4th); Wilton Parish, Salisbury (11st); Methodist College, Belfast (25th).

Tuesdays

0030 BBC: Panel Game. This month, Fred Harris quizzes contestants on science in "The Litmus Test."

Wednesdays

0030 BBC: Omnibus. Topical features on a range of topics, from Dracula to drugs.

Thursdays

0030 BBC: Comedy. See W 1530.

Fridays

0030 BBC: Musical Feature. Robert Lloyd visits the Amsterdam "Opera House" (1st); hear a rerun of David Brown's series on "Tchaikovsky" (8th-November 26th).

"Calling the Falklands" producer Simon Derry talks to the British Prime Minister, John Major, at the Falkland Islands annual broadcast.

Saturdays

0030 BBC: From The Weeklies. The best extracts from the week's newspapers and magazines.

0045 BBC: The Learning World. See M 0615.

English language

shortwave guide

0100 UTC [9:00 PM EDT/6:00 PM PDT]

FREQUENCIES

0100-0200	Australia, ABC Brisbane	4920do	9660do			
0100-0200	Australia, ABC Perth	9610do				
0100-0200	Australia, Radio	11880pa	15240pa	15320pa	15365pa	
	17715pa 17750as	17795pa	17880as	21740pa		
0100-0200 vl	Australia, VL8A Alice Spg	4835do				
0100-0200 vl	Australia, VL8K Katherine	5025do				
0100-0200 vl	Australia, VL8T Tent Crk	4910do				
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				
0100-0159 sm	Canada, RCI Montreal	6120na	9535am	9755na	11845am	
		11940am				
0100-0130 twhfa	Canada, RCI Montreal	6120am	9535am	9755am	11845am	
		11940am				
0100-0200	Costa Rica,R forPeace Int	7375am	7385na	13630am	15030am	
		21465am				
0100-0200	Cuba, Radio Havana Cuba	6010na	9815na			
0100-0130	Czech Republic, R Prague	7345na	9485na	11990na		
0100-0200	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am	
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9700na	
		9765na	11865na	15105na		
0100-0200	Guam, KSDA AWR Agat	15610as				
0100-0200	Indonesia, Voice of	9675am	11752as			
0100-0130	Iran, VOIRI Tehran	9022am	11790am	15260am		
0100-0120	Italy, RAI Rome	9575na	11800na			
0100-0200	Japan, NHK/Radio Japan	5960na	11815as	11840as	11860as	
		15195as	17775na	17810as	17845as	
0100-0130	Laos, National Radio of	7116as				
0100-0200	Lebanon, King of Hope	6280me				
0100-0200	Namibia, Namibia BC Corp	3290af				
0100-0130	Netherlands, Radio	6020na	6165na	11835na		
0100-0200	New Zealand, R NZ Intl	15120pa				
0100-0130 m	Norway, Radio Norway Intl	9560na				
0100-0200	Philippines, FEBC Manila	15450as				
0100-0200 vl	PNG, Natl BC	4890do				
0100-0200	Russia, Radio Moscow Intl	7205af	9505af	9530am	9765am	
	9815as 11665as	11790am	11805as	11810as	11840as	
	11905as 12050am	15385am	15410am	15425am	15470na	
	15480am 15500am	17560am	17570na	17590na	17655as	
	17720na 17835na	17860as	17870na	21570as	21625as	
0100-0200	Singapore, SBC Radio One	5010do	5052do	11940do		
0100-0130	Slovakia, R Slovakia Intl	5930am	7310am	9810am		
0100-0200	South Korea, Radio Korea	7550eu	15575am			
0100-0200	Spain, Spanish Natl Radio	9525am				
0100-0200	Sri Lanka, SLBC Colombo	6005as	9720as	15425as		
0100-0130	Sweden, Radio	9695as	11820as			
0100-0200	Thailand, Radio	4830as	9655as	11905as		
0100-0130	United Kingdom,BBC London	5975na	6005sa	6175na	6180eu	
	7325am 9590am	9915am	11750sa	11955as	12095na	
	15260sa 15310as	15360pa	17790as			
0100-0200	USA, CSMonitor Boston MA	5850na	9850af	13760sa	17555as	
0100-0200 sa	USA, CSMonitor Boston MA	17865as				
0100-0200	USA, KCBI Dallas TX	15725am				
0100-0200	USA, KTBN Salt Lk City UT	7510na				
0100-0200	USA, KVOH Los Angeles CA	17775am				
0100-0200	USA, VOA Washington DC	5995am	6130am	7115as	7205as	
	7405am 7651as	9455am	9775am	11580am	11705as	
	15120am 15160as	15205am	15250as	17740as	21550as	
0100-0130	USA, WEWN Birmingham AL	7425as				
0100-0200	USA, WINB Red Lion PA	15145na				
0100-0200	USA, WJCR Upton KY	7490na	13595na			
0100-0200	USA, WRNO New Orleans LA		7355na			
0100-0200	USA, WWCR Nashville TN	7435va	13845am			
0100-0200	USA, WYFR Okeechobee FL	6065am	6085am	9505am	15440am	
0100-0130	Uzbekhistan, R Tashkent	7285as	9715as	15295as	17815as	
0130-0200	Albania, R Tirana Intl	11840na				
0130-0200	Austria, R Austria Intl	6015na	9870sa	9880na		
0130-0150 mtwhfa	Greece, Voice of	9380na	9420na	11645na		
0130-0200	Netherlands, Radio	9860as	11655as	12025as	13700as	
0130-0200 mtwhf	Portugal, Radio	9555na	9570na	9600na	9705na	
		11840na				
0130-0200	Serbia, Radio Yugoslavia	9580eu				
0130-0200	United Kingdom,BBC London	5975na	6005na	6175na	6180eu	
	7325am 9580am	9590na	9915am	11750sa	11955as	
	12095na 15260sa	15310as	15360pa	17790as		
0130-0200	USA, WHRI Noblesville IN	7315am				
0145-0200 smtwhf	Finland, Radio	11755na	15185na			
0145-0200	Vatican State, Vatican R	7125pa	9650as			

SELECTED PROGRAMS

Sundays

0101 BBC: Play Of The Week. "Jennie's Story" (3rd); "A Dangerous Game" (10th); "Brighton Beach Memoirs" (17th, 24th); "The Glass Menagerie" (31st, starting 0030 UTC).
0109 Deutsche Welle: Commentary. Opinion on current issues.
0115 Radio Japan: This Week. The major events of the week.
0115 Radio Korea: News Commentary. Opinion.
0117 Deutsche Welle: Feature. "Mailbag," "Nickelodeon" (listener requests for German music), or "Technical Tips For DXers."
0120 Radio Korea: Countdown To Taejon Expo 1993.
0134 Deutsche Welle: German By Radio. Advanced German.
0135 Radio Austria Int'l: Report From Austria. News magazine.
0135 Radio Korea: From Us To You. Letters, questions, music.

Mondays

0101 BBC: Feature. This month: "Hair — A Critical Celebration" (4th); "In Their Element — Earth" (11th); "Dot, Dot, Dash"
0105 Radio Norway Int'l: Norway Now. See S 1205.
0109 Deutsche Welle: Commentary. See S 0109.
0115 BBC: Feature. Tim Sebastian looks at the international black market in "Turning A Blind Eye" (18th thru Nov. 8th).
0115 Radio Japan: Let's Learn Japanese. See S 0515.
0115 Radio Korea: Echoes Of Korean Music. See S 0615.
0116 Deutsche Welle: Living In Germany. Social scene.
0130 Radio Japan: Media Roundup. See S 0530.
0134 Deutsche Welle: Larry's Random Selection. Larry Wayne takes a look at Germany from the lighter side.
0135 Radio Austria Int'l: Report From Austria. See S 0135.
0135 Radio Korea: Shortwave Feedback. See S 0635.
0145 BBC: Musical Feature. Keith Harvey introduces "The Cello On Record" (4th, 11th); Peter Paul Nash looks at musical "American Pioneers" (through November 8th).
0155 Radio Japan: Viewpoint. See S 0355.

Tuesdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0234.
0115 Radio Japan: Spectrum. See M 0515.
0115 Radio Korea: News Commentary. See S 0115.
0120 Radio Korea: Seoul Calling. See M 0620.
0130 BBC: Folk Routes. Ian Anderson presents a selection.
0135 Radio Austria Int'l: Report From Austria. See S 0135.
0140 Radio Korea: Tales From Korea's Past. See M 0640.
0145 BBC: Health Matters. Medical developments, keeping fit.
0150 Radio Japan: Commentary. See M 0350.
0155 Radio Japan: Tokyo Pop-In. See M 0555.

Wednesdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0234.
0115 Radio Japan: Enjoy Japanese. See T 0515.
0115 Radio Korea: News Commentary. See S 0115.
0120 Radio Korea: Seoul Calling. See M 0620.
0130 BBC: Talks. Michael Rosen presents more "Poems By Post" (6th); Michael Diamond looks at "Changing Reputations" (through November 10th).
0135 Radio Austria Int'l: Report From Austria. See S 0135.
0140 Radio Korea: Korean Cultural Trails. See T 0640.
0145 BBC: Country Style. Selections of country music.
0150 Radio Japan: Commentary. See M 0350.
0155 Radio Japan: Tokyo Pop-In. See M 0555.

Thursdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0234.
0115 Radio Japan: Spectrum. See M 0515.
0115 Radio Korea: News Commentary. See S 0115.
0120 Radio Korea: Seoul Calling. See M 0620.
0130 BBC: Waveguide. See W 0415.
0135 Radio Austria Int'l: Report From Austria See S 0135.
0140 BBC: Book Choice. See W 0425.
0140 Radio Korea: Pulse Of Korea. See W 0640.
0145 BBC: The Farming World. Agriculture, forestry, fishing worldwide.
0150 Radio Japan: Commentary. See M 0350.
0155 Radio Japan: Tokyo Pop-In. See M 0555.

Fridays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0234.
0115 Radio Japan: The Travel And Book Beat. See H 0515.
0115 Radio Korea: News Commentary. See S 0115.
0120 Radio Korea: Seoul Calling. See M 0620.
0130 BBC: On The Move. News from travel and transport.
0130 Radio Japan: Crosscurrents. See M 0330.
0130 Radio Korea: Korean Literary Corner. See H 0630.
0135 Radio Austria Int'l: Report From Austria. See S 0135.
0140 Radio Korea: Forward To Reunification. See H 0640.
0145 BBC: Global Concerns. An update on environmental issues.
0150 Radio Japan: Commentary. See M 0350.
0155 Radio Japan: Tokyo Pop-In. See M 0555.

Saturdays

0105 BBC: Outlook. See M 1405.
0109 Deutsche Welle: European Journal. See M 0234.
0115 Radio Japan: Music Mix. See F 0515.
0115 Radio Korea: News Commentary. See S 0115.
0120 Radio Korea: Let's Sing Together. See F 0620.
0130 BBC: Short Story (except 2nd: Seeing Stars). See S 0430.
0134 Deutsche Welle: Through German Eyes. See S 1513.
0135 Radio Austria Int'l: Report From Austria. See S 0135.
0140 Radio Korea: Let's Learn Korean. See F 0640.
0145 BBC: Jazz Now And Then. George Reid presents a mix.
0150 Radio Japan: Commentary. See M 0350.
0155 Radio Japan: Tokyo Pop-In. See M 0555.

English language

shortwave guide

0200 UTC [10:00 PM EDT/7:00 PM PDT]

FREQUENCIES

0200-0300 twhfa	Argentina, RAE	11710am			
0200-0300	Australia, ABC Brisbane	4920do	9660do		
0200-0300	Australia, ABC Perth	4910do	9610do	15425do	
0200-0300	Australia, Radio	11720pa	15240pa	15365pa	17715pa
		17750as	17795pa	17880as	21525as
		21595as	21740pa		
0200-0300 vl	Australia, VL8A ALice Spg	4835do			
0200-0300 vl	Australia, VL8K Katherine	5025do			
0200-0300 vl	Australia, VL8T Tent Crk	4910do			
0200-0300	Bulgaria, Radio	15330na			
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			
0200-0259	Canada, RCI Montreal	6120na	9535am	9755na	11845am
		11940am			
0200-0300	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030na
0200-0300	Cuba, Radio Havana Cuba	6010na	13660na		
0200-0300	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0200-0300	Egypt, Radio Cairo	9475na	11660na		
0200-0210 smtwhf	Finland, Radio	11755na	15185na		
0200-0250	Germany, Deutsche Welle	7285as	9615as	9690as	11945as
		11965as	13790as	15185as	15560as
0200-0300 as	Guam, KSDA AWR Agat	13720as			
0200-0300	Hungary, Radio Budapest	5970na	9835na	11910na	15220na
0200-0300 vl	Italy, IRRS Milano	7125va			
0200-0230 mtwhfa	Kenya, Kenya BC Corp	4935do			
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do			
0200-0300	Namibia, Namibia BC Corp	3290af			
0200-0300	Netherlands, Radio	9860as	11655as	12025as	13700as
0200-0300	New Zealand, R NZ Intl	15120pa			
0200-0230 m	Norway, Radio Norway Intl	9560na	11925na		
0200-0230	Philippines, FEBC Manila	15450as			
0200-0300 vl	PNG, Natl BC	4980do			
0200-0300	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0200-0300	Russia, AWR Russia	11835eu			
0200-0300	Russia, Radio Moscow Intl	7205am	7335am	9530am	9765am
		11805na	11840na	12050am	13755as
		13775as	15220am	15280am	15375am
		15385am	15410am	15425am	15470am
		15480am	17560am	17570am	17590am
		17600am	17640am	17835am	17850am
		17860am	17870am	21570am	
0200-0300	S Africa, Channel Africa	5960af	9730af		
0200-0300	Singapore, SBC Radio One	5010do	5052do	11940do	
0200-0300	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0200-0230	Sweden, Radio	9695na	11705na		
0200-0230	Switzerland, Swiss R Intl	6135am	9650am	9885am	12035am
0200-0300	Taiwan, VO Free China	5950na	9680na	11740na	15345na
0200-0300	Thailand, Radio	4830as	9655as	11905as	
0200-0230	United Kingdom,BBC London	5975na	6005sa	6175na	6195eu
		7135me	7325am	9410eu	9590am
		9915am	11730af	11750sa	11955as
		12095na	15260sa	15310as	15360pa
		15380as	17790as	21715as	
0200-0300	USA, CSMonitor Boston MA	5850na	9350af	9455na	13760sa
0200-0300 sa	USA, CSMonitor Boston MA	17555as	17865as		
0200-0230	USA, KCBI Dallas TX	15375am			
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0230	USA, KVOH Los Angeles CA	17775am			
0200-0230 twhfa	USA, VOA Washington DC	5995am	7405am	9775am	11580am
		15120am	15205am		
0200-0300	USA, VOA Washington DC	7115as	7205as	7651as	11705as
		15160as	15250as	17740as	21550as
0200-0300	USA, WHRI Noblesville IN	7315na			
0200-0300	USA, WINB Red Lion PA	15145eu			
0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0300	USA, WWCR Nashville TN	5935am	7435va		
0200-0300	USA, WYFR Okeechobee FL	5985am	6065am	9505am	15440am
0205-0230 tes-vl	Moldova, Natl R of Moldov	7125na			
0215-0255	Nepal, Radio	3230do	5005do	7165do	
0230-0300	Albania, R Tirana Intl	9580na	11840na		
0230-0300 s	Kenya, Kenya BC Corp	4935do			
0230-0245	Pakistan, Radio	17705as	17725as		
0230-0300	Philippines, R Pilipinas	17760as	17840as	21580as	
0230-0300	United Kingdom,BBC London	5975na	6005sa	6175na	6195eu
		7135me	7325am	9410eu	9915am
		11730af	11750sa	11955as	11965na
		12095na	15260sa	15310as	15360pa

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. Jonathan Marcus presents the history of warfare in "From Hoplite To Harrier" (through Nov. 7th).

Mondays

0205 Radio Norway Int'l: Norway Now. See S 1205.
0209 Deutsche Welle: Asia-Pacific Report. Correspondents' reports, interviews, and analysis from Asia and the Pacific.
0230 BBC: Composer Of The Month. Profiles of famous classical composers. This month:Puccini.
0234 Deutsche Welle: European Journal. A review of major events in Europe, with interviews and analysis.

Tuesdays

0209 Deutsche Welle: Asia-Pacific Report. See M 0209.
0230 BBC: Quiz. See M 1215.
0234 Deutsche Welle: European Journal. See M 0234.

Wednesdays

0209 Deutsche Welle: Asia-Pacific Report. See M 0209.

Thank You!

Additional contributors to this month's Shortwave Guide:

Bob Fraser, Cohasset, MA; Ed Rausch, Cedar Grove, NJ; George Jacobs, Silver Springs, MD; Frank Hillton, Charleston, SC; Fine Tuning; NASWA Journal; Speedx Shortwave Radio Today; BBC Monitoring Service

0230 BBC: Development '93. Aid and development issues for developing nations.
0234 Deutsche Welle: European Journal. See M 0234.

Thursdays

0209 Deutsche Welle: Asia-Pacific Report. See M 0209.
0230 BBC: Sports International. Live play-by-play, interviews, features, and discussions from the sports world.
0234 Deutsche Welle: European Journal. See M 0234.

Fridays

0209 Deutsche Welle: Asia-Pacific Report. See M 0209.
0230 BBC: Drama. See H 1130.
0234 Deutsche Welle: European Journal. See M 0234.

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. Background to the British political scene.
0234 Deutsche Welle: Economic Notebook. See F 1534.

0300 UTC [11:00 PM EDT/8:00 PM PDT]

FREQUENCIES

0300-0400	Australia, AAF Radio	19037af	23678as		
0300-0400	Australia, ABC Brisbane	4920do	9660do		
0300-0400	Australia, ABC Perth	9610do			
0300-0400	Australia, Radio1	1720pa	11880pa	15240pa	15320pa
	15365pa 17715pa	17750as	17795pa	17880as	21525pa
	21595as 21740pa				
0300-0400 vl	Australia, VL8A Alice Spg	4835do			
0300-0400 vl	Australia, VL8K Katherine	5025do			
0300-0400 vl	Australia, VL8T Tent Crk	4910do			
0300-0400	Bahrain, Radio	6010do			
0300-0400	Bulgaria, Radio	9850na	11765na		
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, China Radio Intl	9690na	9780na	11715na	
0300-0400	Costa Rica,Faro del Carib	5055do			
0300-0400	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030na
0300-0400	Cuba, Radio Havana Cuba	6010na	9655na	11970na	
0300-0330	Czech Republic, R Prague	5930na	7345na	9485na	9810na
		11990na			
0300-0400	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0300-0330	Egypt, Radio Cairo	9475na	11660na		
0300-0350	Germany, Deutsche Welle	6085na	6145na	9640na	9700na
		11715na	13790na		
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400 sm	Honduras, R Luz y Vida	3250ca			
0300-0400	Hungary, Radio Budapest	9835na	11910na	15220na	
0300-0400	Japan, NHK/Radio Japan	15210am	15230am	17810am	21610am
0300-0400	Kenya, Kenya BC Corp	4935do			
0300-0400 mtwhf	Lebanon, Winds of Hope	11530me			
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do			
0300-0330	Netherlands, Radio	9860as	11655as	12025as	13700as
0300-0400	New Zealand, R NZ Intl	15120pa			
0300-0330 m	Norway, Radio Norway Intl	11865na			
0300-0330	Philippines, R Pilipinas	17760as	17840as	21580as	
0300-0400 vl	PNG, Natl BC	4890do			
0300-0400	Russia, Radio Moscow Intl	7205am	7335am	9530am	9765na
	9860am 11690na	11790na	11840na	11875na	12070as
	15220as 15280am	15320am	15375as	15410na	15425na
	15470as 15535as	17560as	17570as	17600as	17605am
	17640as 17670as	17685as	17735as	17850as	17860as
0300-0400	S Africa, Channel Africa	5960af	9730af		
0300-0400	Singapore, SBC Radio One	5010do	5052do	11940do	
0300-0400	Sri Lanka, SLBC Colombo	9720as	15425as		
0300-0400	Taiwan, VO Free China	5950na	9680na	9765as	11740as
0300-0400	Tanzania, Radio	5985af	9685af	11765af	
0300-0400	Thailand, Radio	9655as	11905as		
0300-0400	Turkey, Voice of	9445na			
0300-0400 vl	Uganda, Radio	4976do			
0300-0330	United Kingdom,BBC London	3255af	5975na	6005va	6175na
	6180eu 6190af	6195me	7135me	7230eu	7325am
	9410eu 9600af	9915am	11730af	11750sa	11760me
	11955me 12095as	15260sa	15310as	15360pa	15380as
	21715as				
0300-0400	USA, CSMonitor Boston MA	5850na	9350af	9455na	13760sa
0300-0400 sa	USA, CSMonitor Boston MA	17555as	17865as		
0300-0400	USA, KCBI Dallas TX	13720am			
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9785sa			
0300-0400	USA, VOA Washington DC	6065af	7265af	7280af	7405af
		9575af	9665af	9885af	
0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	USA, WHRI Noblesville IN	7315na			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400	USA, WRNO New Orleans LA		7395am		
0300-0400	USA, WWCR Nashville TN	5935am	7435am		
0300-0400	USA, WYFR Okeechobee FL	6065am	6085am	9505am	
0300-0345	Vatican State, Vatican R	9605na	11620na	11625af	
0330-0400	Austria, R Austria Intl	6015na	9870na	9880na	
0330-0400	Netherlands, Radio	6165na	9590na		
0330-0400	UAE, UAE Radio Dubai	11945na	13675na	15400eu	17890eu
		21485na			
0330-0400	United Kingdom,BBC London	3255af	5975na	6005af	6180eu
	6190af 6195eu	7230eu	9410eu	9600af	11730af
	11760me 11955me	12095va	15280as	15310as	15420af
	21715as				
0340-0350 mtwhfa	Greece, Voice of	9380na	9420na	11645na	
0345-0400	Tajikistan, Radio	7245eu			

SELECTED PROGRAMS

Sundays

0309 Deutsche Welle: Commentary. See S 0109.
0315 BBC: Sports Roundup. News from the world of sports.
0315 Radio Japan: Hello From Tokyo. Kiyoko Tanaka and David Powers present listener letters and questions.
0317 Deutsche Welle: Feature. See S 0117.
0330 BBC: From Our Own Correspondent. Reporters comment on the background to the news.
0330 Radio Austria Int'l: Austrian Coffee Table. A look at the arts, especially music.
0334 Deutsche Welle: German By Radio. See S 0134.
0350 BBC: Write On. Listener letters, opinions, and questions.
0355 Radio Japan: Viewpoint. Japan's international role with regard to major issues at home and abroad.

Mondays

0309 Deutsche Welle: Commentary. See S 0109.
0315 BBC: Sports Roundup. See S 0315.
0315 Radio Japan: Sports Spotlight. The latest news from the world of sports.
0316 Deutsche Welle: Living In Germany. See M 0116.
0330 BBC: Anything Goes. See S 1430.
0330 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
0330 Radio Japan: People. Profiles of leading Japanese in various fields.
0334 Deutsche Welle: Larry's Random Selection. See M 0134.
0350 Radio Japan: Commentary. Opinions on current news events worldwide.

Tuesdays

0309 Deutsche Welle: European Journal. See M 0234.
0315 BBC: Sports Roundup. See S 0315.
0315 Radio Japan: A Glimpse Of Japan. Japanese culture, lifestyles, and traditions.
0330 BBC: John Peel. Newly released albums and singles from the contemporary music scene.
0330 Radio Japan: World Update. Issues affecting the world, from the environment to AIDS.
0334 Deutsche Welle: Economic Notebook. A look at the economic scene in Germany and around the world.
0335 Radio Austria Int'l: Report From Austria. See S 0135.
0350 Radio Japan: Commentary. See M 0350.

Wednesdays

0309 Deutsche Welle: European Journal. See M 0234.
0315 BBC: Sports Roundup. See S 0315.
0315 Radio Japan: Asia Hotline. A look at the rapid changes in other Asian nations.
0330 BBC: Discovery. Developments from the world of science.
0330 Radio Japan: Asia Plaza. No details available.
0334 Deutsche Welle: Insight. See T 1534.
0335 Radio Austria Int'l: Report From Austria. See S 0135.
0350 Radio Japan: Commentary. See M 0350.

Thursdays

0309 Deutsche Welle: European Journal. See M 0234.
0315 BBC: Sports Roundup. See S 0315.
0315 Radio Japan: Japan Close-Up. No details available.
0330 BBC: Assignment. A weekly examination of topical issues, from Batman to bandits.
0330 Radio Japan: Crosscurrents. A current affairs program featuring views from Japan and abroad.
0334 Deutsche Welle: German By Radio. See S 0134.
0335 Radio Austria Int'l: Report From Austria. See S 0135.
0350 Radio Japan: Commentary. See M 0350.

Fridays

0309 Deutsche Welle: European Journal. See M 0234.
0315 BBC: Sports Roundup. See S 0315.
0315 Radio Japan: Business Focus. Economic issues inside and outside Japan.
0330 BBC: Focus On Faith. Comment and discussion on major issues in the worlds of religion.
0330 Radio Japan: Techno-Business. Japanese business trends and new technology.
0334 Deutsche Welle: Science And Technology. See M 1634.
0335 Radio Austria Int'l: Report From Austria. See S 0135.
0350 Radio Japan Commentary. See M 0350.

Saturdays

0309 Deutsche Welle: European Journal. See M 0234.
0315 BBC: Sports Roundup. See S 0315.
0315 Radio Japan: This Week. See S 0115.
0330 BBC: The Vintage Chart Show. Paul Burnett presents classic hits from the UK Top 20. This month: 1962 (2nd); 1974 (9th); 1969 (16th); 1981 (23rd); 1967 (30th).
0334 Deutsche Welle: Through German Eyes. See S 1513.
0335 Radio Austria Int'l: Report From Austria. See S 0135.

English language

shortwave guide

0400 UTC [12:00 AM EDT/9:00 PM PDT]

FREQUENCIES

0400-0500	Australia, ABC Brisbane	4920do	9660do		
0400-0500	Australia, ABC Perth	9610do			
0400-0500	Australia, Radio	11720pa	11880pa	15240pa	15320pa
		15365pa	17715pa	17795pa	17840as
		21595as	21740pa		
0400-0500 vl	Australia, VL8A Alice Spg	4835do			
0400-0500 vl	Australia, VL8K Katherine	5025do			
0400-0500 vl	Australia, VL8T Tent Crk	4910do			
0400-0500	Bahrain, Radio	6010do			
0400-0404	Botswana, Radio	3356do	4830af	7255af	
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			
0400-0429	Canada, RCI Montreal	9650me	11905me	11925me	15275me
		15445me			
0400-0500	China, China Radio Intl	11680na	11840na		
0400-0500 vl	Congo, R Natl Congolaise	4765do	5985do		
0400-0500	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030am
0400-0430	Croatian Radio via WHRI	7315na			
0400-0430	Cuba, Radio Havana Cuba	6010na	6180am	9655na	13660na
0400-0430	Czech Republic, R Prague	7345na	9485na	9810na	11990na
		13715af	17535sa		
0400-0430	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0400-0450	Germany, Deutsche Welle	6015af	6145af	7150af	7225af
		9565af	9765af	11705af	11765af
		13610af	13770af		
0400-0430	Guatemala, Radio Cultural	3300do			
0400-0415	Israel, Kol Israel	9435na			
0400-0500	Kenya, Kenya BC Corp	4935do			
0400-0500 mtwhf	Lebanon, Wings of Hope	11530me			
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do			
0400-0430	Netherlands, Radio	6165na	9590na		
0400-0500	New Zealand, R NZ Intl	15120pa			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as	
0400-0430 m	Norway, Radio Norway Intl	9655na	9740na		
0400-0500 vl	PNG, Natl BC	4890do			
0400-0430	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0400-0500	Russia, Radio Moscow Intl	9610eu	9750eu	9765eu	9860na
		11690na	11790na	12050na	12070am
		13650am	15180na	15280na	15320na
		15410na	15425na	15470na	15500na
		15535na	17560na	17570as	17590as
		17605na	17775as	17835as	17850na
		17860na	17880as	21820as	
0400-0500	S Africa, Channel Africa	3995af	7230af		
0400-0500	Singapore, SBC Radio One	5010do	5052do	11940do	
0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as		
0400-0430	Switzerland, Swiss R Intl	6135na	9860na	9885na	12035na
0400-0430 mtwhf	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0400-0430	Tanzania, Radio	5985af	9685af	11765af	
0400-0430	Thailand, Radio	4830as	9655as	11905as	
0400-0500 vl	Uganda, Radio	4976do			
0400-0430	United Kingdom,BBC London	3955eu	5975na	6005af	6180eu
		6195eu	7230eu	9410eu	9600af
		11760me	11955me	12095va	15280as
		15310va	15575va	21715as	
0400-0500	USA, CSMonitor Boston MA	9455am	9840af	13760sa	17780as
0400-0500 sa	USA, CSMonitor Boston MA	17555as			
0400-0500	USA, KCBI Dallas TX	13720am			
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9785am			
0400-0430	USA, VOA Washington DC	5995eu	6040eu	6065eu	6140eu
		6155eu	6873af	7170eu	7200eu
		7265af	7280eu	7405eu	9575eu
		9885eu	11965eu	15205eu	
0400-0500	USA, WEWN Birmingham AL	7425na			
0400-0500	USA, WHRI Noblesville IN	7315na			
0400-0500	USA, WJCR Upton KY	7490na	13595na		
0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0500	USA, WRNO New Orleans LA		7395am		
0400-0500	USA, WWCR Nashville TN	5935am	7435am		
0400-0500	USA, WYFR Okeechobee FL	6065am	9505am		
0415-0440	Italy, RAI Rome	7275eu	9575eu		
0430-0500	Cuba, Radio Havana Cuba	6010na	6180na	13660na	
0430-0450 s	Finland, Radio	6120eu	9665eu		
0430-0450	Finland, Radio	11755me	15440af		
0430-0500	Italy, AWR Europe	15125eu			
0430-0500	Nigeria, Radio	3326do	4770do		
0430-0500	Russia, AWR Russia	15125eu			
0430-0500	Swaziland, Trans World R	5965af	9655af	11740af	
0430-0500	United Kingdom,BBC London	3955eu	5975na	6005af	6175eu
		6180eu	6190af	6195eu	9410eu
		9600af	11760me	12095va	15280as
		15310va	15325eu	15400af	15575va
		21470va	21715as		
0430-0500	USA, VOA Washington DC	3980eu	5995eu	6040eu	6140eu
		6873af	7170eu	7200eu	7265af
		7280af	7405af	9575af	15205eu
0435-0500 mtwhf	Namibia, Namibia BC Corp	4965af			
0445-0500 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0455-0500	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. This month, Steve Wright selects records from the BBC vaults in "Live From The Archive."
0419 Deutsche Welle: International Talking Point. A round-table discussion on major trends and events.
0430 BBC: Short Story. This month: "Golden Opportunities" (10th); "The Birdman" (17th); "Dog Training" (24th); "Hat" (31st) (except 3rd: Seeing Stars, a monthly look at astronomy).
0434 Deutsche Welle: People And Places. Interviews, stories, and music beamed to Africa.
0445 BBC: Feature. John Pickford travels to all four "Points Of The Compass" (3rd); linguistiic change is the fare in "English Language Today" (10th, 17th, 24th, 31st).

Mondays

0405 Radio Norway Int'l: Norway Now. See S 1205.
0409 Deutsche Welle: European Journal. See M 0234.
0415 BBC: Talks. This month, David Edmonds presents "Western Philosophers In A Nutshell."
0430 BBC: Off The Shelf. This month: Philip Larkin's "A Girl In Winter" (4th-11th); Henry David Thoreau's "Walden" (18th-26th); Joseph Mitchell's "McSorley's Wonderful Saloon" (27th-November 2nd).
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. New and unusual sounds from the world over.

Tuesdays

0409 Deutsche Welle: Africa Report. Reports and background to the news from correspondents.
0415 BBC: Health Matters. See T 0145.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: European Journal. See M 0234.
0445 BBC: On Screen. See M 2315.

Wednesdays

0409 Deutsche Welle: Africa Report. See T 0409.
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.
0434 Deutsche Welle: European Journal. See M 0234.
0445 BBC: Country Style. See W 0145.

Thursdays

0409 Deutsche Welle: Africa Report. See T 0409.
0415 BBC: The Farming World. See H 0145.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: European Journal. See M 0234.
0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

0409 Deutsche Welle: Africa Report. See T 0409.
0415 BBC: Musical Feature. See M 0145.
0430 BBC: Off The Shelf. See M 0430.
0434 Deutsche Welle: European Journal. See M 0234.
0445 BBC: Folk Routes. See T 0130.

Saturdays

0409 Deutsche Welle: Commentary. See S 0109.
0415 BBC: Good Books. See W 1445.
0423 Deutsche Welle: Panorama. See A 0223.
0430 BBC: Jazz Now And Then. See A 0145.
0434 Deutsche Welle: Man And Environment. See T 1634.
0445 BBC: Worldbrief. See F 2315.

English language **shortwave guide**

0500 UTC [1:00 AM EDT/10:00 PM PDT]

FREQUENCIES

0500-0600	Australia, ABC Brisbane	4920do	9660do		
0500-0600	Australia, ABC Perth	9610do			
0500-0530	Australia, Radio	11720pa	11880pa	15240pa	15320pa
		15365pa	17715pa	17795pa	17880as
		21525as	21595as	21740pa	
0500-0600 vl	Australia, VL8A ALice Spg	4835do			
0500-0600 vl	Australia, VL8K Katherine	5025do			
0500-0600 vl	Australia, VL8T Tent Crk	4910do			
0500-0600	Bahrain, Radio	6010do			
0500-0505	Canada, CBC Northern Svc	9625am			
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			
0500-0529 mtwhf	Canada, RCI Montreal	6050eu	6150eu	7295eu	9750eu
		11775eu	15430eu	17840eu	
0500-0600	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030na
0500-0515	Croatian Radio via WHRI	7315na	9495na		
0500-0600	Cuba, Radio Havana Cuba	9510na			
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0550	Germany, Deutsche Welle	5960na	9515na	9670na	11705na
0500-0600 vl	Italy, IRRS Milano	7125va			
0500-0600	Japan, NHK/Radio Japan	6085me	7230eu	9725me	11725am
		11740am	15230na	15410am	17810am
0500-0600	Kenya, Kenya BC Corp	4935do			
0500-0600 vl	Kiribati, Radio	17440do			
0500-0600 mtwhf	Lebanon, Wings of Hope	11530me			
0500-0505	Lesotho, Radio	4800do			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600 mtwhf	Namibia, Namibia BC Corp	3270af	3290af		
0500-0600 vl	New Zealand, R NZ Intl	15120pa			
0500-0600	Nigeria, Radio	3326do	4770do	4990do	
0500-0600	Nigeria, Voice of	7255af			
0500-0600 vl	PNG, Natl BC	4890do			
0500-0600	Russia, Radio Moscow Intl	9750eu	9765eu	9905eu	11690eu
		11790eu	12050na	13650af	15180na
		15280na	15410na	15425na	15470na
		15500na	15535na	15540af	15590af
		17560af	17570as	17590as	17605as
		17635as	17675as	17720as	17730as
		17775af	17830as	17860af	21690as
0500-0600	S Africa, Channel Africa	9695af			
0500-0600 vl	S Africa, Radio Oranje	9630do			
0500-0553 f	Seychelles, FEBA Radio	17750me			
0500-0600	Singapore, SBC Radio One	5052do	11940do		
0500-0556	Spain, Spanish Natl Radio	9525am			
0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0500-0530	Swaziland, Trans World R	5965af	9655af	11740af	
0500-0515 mtwhf	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0500-0600	Thailand, Radio	4830as	9655as	11905as	
0500-0600 vl	Uganda, Radio	4976do			
0500-0530	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	9410eu
		9600af	9640na	11760me	12095va
		15070me	15280as	15310va	15360va
		15400af	15420af	15575eu	17830va
		17885af	21470va	21715as	
0500-0600	USA, CSMonitor Boston MA	9455na	9840af	13760sa	17780as
0500-0600 sa	USA, CSMonitor Boston MA	17555as			
0500-0600	USA, KCBI Dallas TX	13720am			
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9785am			
0500-0530	USA, VOA Washington DC	3980eu	5995eu	6040eu	6140eu
		6873eu	7170eu	9530eu	9700eu
		11825eu	11965eu	15205eu	
0500-0600	USA, VOA Washington DC	6035af	7405af	9665af	12080af
0500-0600	USA, WINB Red Lion PA	15145eu			
0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA		7395am		
0500-0600	USA, WWCR Nashville TN	5935am	7435am		
0500-0600	USA, WYFR Okeechobee FL	5985am	11580eu	11725eu	13695eu
0500-0520	Vatican State, Vatican R	6245eu	7250eu	11730af	
0510-0520 mtwhfa	Botswana, Radio	3356af	4830af	7255af	
0524-0600 f	Ghana, GBC Radio 2	3366do			
0525-0600	Ghana, GBC Radio 1	4915do			
0530-0600	Australia, Radio	15240pa	15320pa	15365pa	17715pa
		17795pa	21525pa	21595as	21740pa
0530-0600	Austria, R Austria Intl	6015na			
0530-0600	Romania, R Romania Intl	15380af	17720af	17745af	17790af
0530-0600 vl	Russia, Radio Centre	12010eu			
0530-0600	Swaziland, Trans World R	5965af	11740af		
0530-0600	UAE, UAE Radio Dubai	15435as	17830as	21700as	
0530-0600	United Kingdom,BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	9410eu
		9600af	9640na	9750eu	11760me
		12095va	15070me	15280as	15310va
		15360va	15400af	15420af	15575eu
		17830va	17885af	21470va	21715as
0530-0600	USA, VOA Washington DC	5995me	6035eu	6040me	6140me
		6873me	7170me	7200me	7405eu
		9665me	11965me	12080me	15205me

SELECTED PROGRAMS

Sundays

0509 Deutsche Welle: Commentary. See S 0109.
0515 Radio Japan: Let's Learn Japanese. Japanese language lessons for English speakers.
0517 Deutsche Welle: Feature. See S 0117.
0530 Radio Japan: Media Roundup. News and features from the world of communications, including shortwave radio.
0534 Deutsche Welle: German By Radio. See S 0134.
0535 Radio Austria Int'l: Report From Austria. See S 0135.
0555 Radio Japan: Viewpoint. See S 0355.

Mondays

0509 Deutsche Welle: Commentary. See S 0109.
0515 Radio Japan: Spectrum. Conversations with Japanese intellectuals and foreigners in Japan.
0516 Deutsche Welle: Living In Germany. See M 0116.
0534 Deutsche Welle: Larry's Random Selection. See M 0134.
0535 Radio Austria Int'l: Report From Austria. See S 0135
0550 Radio Japan: Commentary. See M 0350.
0555 Radio Japan: Tokyo Pop-In. A short segment featuring a popular song from Japan.

Tuesdays

0509 Deutsche Welle: European Journal. See M 0234.
0515 Radio Japan: Enjoy Japanese. Japanese language lessons for English speakers.
0535 Radio Austria Int'l: Report From Austria. See S 0135.
0550 Radio Japan: Commentary. See M 0350.
0555 Radio Japan: Tokyo Pop-In. See M 0555.

Wednesdays

0509 Deutsche Welle: European Journal. See M 0234.
0515 Radio Japan: Spectrum. See M 0515.
0535 Radio Austria Int'l: Report From Austria. See S 0135.
0550 Radio Japan: Commentary. See M 0350.
0555 Radio Japan: Tokyo Pop-In. See M 0555.

Thursdays

0509 Deutsche Welle: European Journal. See M 0234.
0515 Radio Japan: The Travel And Book Beat. No details available.
0535 Radio Austria Int'l: Report From Austria. See S 0135.
0550 Radio Japan: Commentary. See M 0350.
0555 Radio Japan: Tokyo Pop-In. See M 0555.

Fridays

0509 Deutsche Welle: European Journal. See M 0234.
0515 Radio Japan: Music Mix. No details available.
0535 Radio Austria Int'l: Report From Austria. See S 0135.
0550 Radio Japan: Commentary. See M 0350
0555 Radio Japan: Tokyo Pop-In. See M 0555.

Saturdays

0509 Deutsche Welle: European Journal. See M 0234.
0515 Radio Japan: This Week. See S 0115.
0534 Deutsche Welle: Through German Eyes. See S 1513.
0535 Radio Austria Int'l: Report From Austria. See S 0135.

English language **shortwave guide**

0600 UTC [2:00 AM EDT/11:00 PM PDT]

FREQUENCIES

0600-0700	Australia, ABC Brisbane	9660do			
0600-0700	Australia, ABC Perth	15425do			
0600-0630	Australia, Radio	15240pa	15320pa	15365pa	17670as
	17715pa 17880as	21525as	21595as	21740pa	
0600-0700 vl	Australia, VL8A ALice Spg	4835do			
0600-0700 vl	Australia, VL8K Katherine	5025do			
0600-0700 vl	Australia, VL8T Tent Crk	4910do			
0600-0700	Bahrain, Radio	6010do			
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	Costa Rica,R forPeace Int	7375na	7385na	13630am	15030na
0600-0700	Cuba, Radio Havana Cuba	6000na	9510na		
0600-0630	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
0600-0700	Ecuador, HCJB Quito	11925am	15155am	21455am	
0600-0650	Germany, Deutsche Welle	11780af	13790af	15185af	15205af
		17875af			
0600-0700	Ghana, GBC Radio 1	4915do			
0600-0700 f	Ghana, GBC Radio 2	3366do			
0600-0700 vl	Italy, IRRS Milano	7125va			
0600-0700	Japan, NHK/Radio Japan	11860as	15325as	21610as	
0600-0625	Kenya, Kenya BC Corp	4935do			
0600-0700 vl	Kiribati, Radio	17440do			
0600-0630	Laos, National Radio of	7116as			
0600-0630 s	Latvia, Radio Riga	5935eu			
0600-0630 mtwhf	Lebanon, Wings of Hope	11530me			
0600-0700 as	Lebanon, Wings of Hope	11530me			
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V of Mediterranean	9765eu			
0600-0700	Namibia, Namibia BC Corp	6175af			
0600-0658	New Zealand, R NZ Intl	15120pa			
0600-0700 s	New Zealand, ZLXA	3935do			
0600-0700	Nigeria, Radio	3970do	4770do		
0600-0700	Nigeria, Voice of	7255af			
0600-0650	North Korea, R Pyongyang	15180as	15230as		
0600-0700 vl	PNG, Natl BC	4890do			
0600-0630	Romania, R Romania Intl	7225eu	9510eu	9665eu	11810eu
0600-0700	Russia, Radio Moscow Intl	9750eu	9765eu	9905eu	11765am
	11985na 12010af	12050af	12055am	12070eu	13650na
	15125am 15140na	15180na	15250na	15410na	15425na
	15470na 15500na	15540am	17560am	17570am	17595am
	17605na 17665na	17675am	17860am	21690am	
0600-0700	S Africa, Channel Africa	15220af	17710af		
0600-0700 vl	S Africa, Radio Oranje	9630do			
0600-0608 f	Seychelles, FEBA Radio	17750me			
0600-0700 vl	Sierra Leone, SLBS	3316do			
0600-0700	Singapore, SBC Radio One	5010do	5052do	11940do	
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	South Korea, Radio Korea	7275na	11945na	15155na	
0600-0700	Swaziland, Trans World R	5965af	11740af		
0600-0615	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0600-0630	Switzerland, Swiss R Intl	13635af	15430af	17565af	
0600-0700 as	Thailand, Radio	4830as	9655as	11905as	
0600-0630	United Kingdom,BBC London	3955eu	5975na	6180eu	6195eu
	7150pa 9410eu	9640va	11940af	11955as	12095eu
	15070va 15280as	15310as	15360as	15400af	15575va
	15575eu 17790as	17830va	21470me	21715as	
0600-0700	USA, CSMonitor Boston MA	9455na	9840eu	9870eu	17555as
		17780as			
0600-0700	USA, KCBI Dallas TX	13720am			
0600-0700	USA, KTBN Salt Lk City UT	7510na			
0600-0700	USA, KVOH Los Angeles CA	9785na			
0600-0700	USA, VOA Washington DC	3980eu	5995me	6005me	6035af
	6040me 6060eu	6095eu	6140eu	6873eu	7170eu
	7325eu 7405af	9530af	9575af	9665af	11805eu
	11925af 11965eu	12080af	15600af		
0600-0700	USA, WEWN Birmingham AL	7425na			
0600-0700	USA, WHRI Noblesville IN	7315eu	9495am		
0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WWCR Nashville TN	5935am	7435am		
0600-0700	USA, WYFR Okeechobee FL	5985am	7355eu	11725eu	13695eu
		15666eu			
0600-0610 mtwhfa	Vatican State, Vatican R	6245eu	7250eu	9645eu	11740eu
		15210eu			
0603-0610	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0615-0630	United Kingdom,BBC London	9510eu	11680eu	11845eu	13660eu
		15325eu	17695eu		
0625-0700	Kenya, Kenya BC Corp	4935do			
0630-0700	Australia, Radio	6020pa	11880pa	15240pa	15320pa
	15365pa 17670as	17715pa	17880as	21525as	21595as
	21740pa				
0630-0700	Austria, R Austria Intl	6015na			
0630-0655	Belgium, R Vlaanderen	5910eu	9925eu		
0630-0700 smtwhf	New Zealand, ZLXA	3935do			
0630-0700	United Kingdom,BBC London	5975na	6180eu	6195eu	7150pa
	9410eu 9640va	11760me	11955as	12095eu	15070va
	15280as 15310as	15360as	15400af	15575va	15575eu
	17790as 17830pa	17885va	21470me	21715as	
0630-0700	Vatican State, Vatican R	11625af	15090af	17730af	
0632-0641	Romania, R Romania Intl	7225eu	9510eu	9665eu	11810eu
0640-0700	Monaco, TWR Monte Carlo	9480eu			
0645-0700	Finland, Radio	6120eu	9560eu	11755eu	
0645-0700	Ghana, GBC	6130af			
0645-0715	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			

SELECTED PROGRAMS

See September issue for 0600 BBC schedule

Sundays

0609 Deutsche Welle: Commentary. See S 0109.
0613 Deutsche Welle: Sports Report. See S 0213.
0615 Radio Japan: Hello From Tokyo. See S 0315.
0615 Radio Korea: Echoes Of Korean Music. No details available.
0619 Deutsche Welle: International Talking Point. See S 0419.
0630 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
0634 Deutsche Welle: People And Places. See S 0434.
0635 Radio Korea: SW Feedback. Listener letters and news.
0655 Radio Japan: Viewpoint. See S 0355.

Mondays

0609 Deutsche Welle: European Journal. See M 0234.
0615 Radio Japan: Sports Spotlight. See M 0315.
0615 Radio Korea: News Commentary. See S 0115.
0620 R Korea: Seoul Calling. Korean music, features, interviews.
0630 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
0630 Radio Japan: People. See M 0330.
0634 Deutsche Welle: Africa In The German Press. See M 0434.
0640 Radio Korea: Tales From Korea's Past. Korean history.
0650 Radio Japan: Commentary. See M 0350.
0655 Radio Japan: Tokyo Pop-In. See M 0555.

Tuesdays

0609 Deutsche Welle: Africa Report. See T 0409.
0615 Radio Japan: A Glimpse Of Japan. See T 0315.
0615 Radio Korea: News Commentary. See S 0115.
0620 Radio Korea: Seoul Calling. See M 0620.
0630 BBC: Rock/Pop Music. This month, George Reid profiles songwriters in "The Tunesmiths."
0630 Radio Japan: World Update. See T 0330.
0634 Deutsche Welle: European Journal. See M 0234.
0635 Radio Austria Int'l: Report From Austria. See S 0135.
0640 Radio Korea: Korean Cultural Trails. Korean culture and art.
0650 Radio Japan: Commentary. See M 0350.
0655 Radio Japan: Tokyo Pop-In. See M 0555.

Wednesdays

0609 Deutsche Welle: Africa Report. See T 0409.
0615 Radio Japan: Asia Hotline. See W 0315.
0615 Radio Korea: News Commentary. See S 0115.
0620 Radio Korea: Seoul Calling. See M 0620.
0630 Radio Japan: Asia Plaza. See W 0330.
0634 Deutsche Welle: European Journal. See M 0234.
0635 Radio Austria Int'l: Report From Austria. See S 0135.
0640 Radio Korea: Pulse Of Korea. Korean development.
0650 Radio Japan: Commentary. See M 0350.
0655 Radio Japan: Tokyo Pop-In. See M 0555.

Thursdays

0609 Deutsche Welle: Africa Report. See T 0409.
0615 Radio Japan: Japan Close-Up. See H 0315.
0615 Radio Korea: News Commentary. See S 0115.
0620 Radio Korea: Seoul Calling. See M 0620.
0630 Radio Japan: Crosscurrents. See H 0330.
0630 Radio Korea: Korean Literary Corner. Korean writers.
0634 Deutsche Welle: European Journal. See M 0234.
0635 Radio Austria Int'l: Report From Austria. See S 0135.
0640 Radio Korea: Forward To Reunification. The prospects for reunion between North and South Korea.
0650 Radio Japan: Commentary. See M 0350.
0655 Radio Japan: Tokyo Pop-In. See M 0555.

Fridays

0609 Deutsche Welle: Africa Report. See T 0409.
0615 Radio Japan: Business Focus. See F 0315.
0615 Radio Korea: News Commentary. See S 0115.
0620 Radio Korea: Let's Sing Together. A sing-along program.
0630 Radio Japan: Techno-Business. See F 0330.
0634 Deutsche Welle: European Journal. See M 0234.
0635 Radio Austria Int'l: Report From Austria. See S 0135.
0640 Radio Korea: Let's Learn Korean. Korean language lessons.
0650 Radio Japan: Commentary. See M 0350.
0655 Radio Japan: Tokyo Pop-In. See M 0555.

Saturdays

0609 Deutsche Welle: Commentary. See S 0109.
0615 Radio Japan: This Week. See S 0115.
0615 Radio Korea: News Commentary. See S 0115.
0620 Radio Korea: Sites And Sounds. See S 0120.
0623 Deutsche Welle: Panorama. See A 0223.
0634 Deutsche Welle: Man And Environment. See T 1634.
0635 Radio Austria Int'l: Report From Austria. See S 0135.
0635 Radio Korea: From Us To You. See S 0135.

English language

shortwave guide

0700 UTC [3:00 AM EDT/12:00 AM PDT]

0700-0800	Australia, ABC Brisbane	4920do	9660do		
0700-0800	Australia, ABC Perth	15425pa			
0700-0730	Australia, Radio	6020pa	11720pa	11880pa	15240pa
	15320pa 15365pa	17695as	17715pa	17750as	21525as
	21595as 21740pa				
0700-0800 vl	Australia, VL8a Alice Spg	4835do			
0700-0800 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Bahrain, Radio 6010do				
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	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030na
0700-0730	Ecuador, HCJB Quito	9600eu	9745na	11835eu	11925am
		15270am	17490am	21455eu	
0700-0800	Ghana, GBC	6130af			
0700-0800	Ghana, GBC Radio 1	4915do			
0700-0800 f	Ghana, GBC Radio 2	3366do			
0700-0800 vl	Italy, IRRS Milano	7125va			
0700-0800	Japan, NHK/Radio Japan	6050as	7230au	11740au	15170as
	15325au 15410au	17765as	17810as	17860as	21610me
0700-0800	Kenya, Kenya BC Corp	4935do			
0700-0800 vl	Kiribati, Radio	17440do			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800	Monaco, TWR Monte Carlo	9480eu			
0700-0800	New Zealand, R NZ Intl	9700pa			
0700-0800 smtwhf	New Zealand, ZLXA	3935do			
0700-0800	Nigeria, Radio	3326do	4990do		
0700-0750	North Korea, R Pyongyang	15340as	17765as		
0700-0800 vl	PNG, Natl BC	4890do			
0700-0800 vl	PNG, Radio Central	3290do			
0700-0800 vl	PNG, Radio Enga	2410do			
0700-0800 vl	PNG, Radio Milne Bay	3365do			
0700-0800 vl	PNG, Radio Western	3305do			
0700-0715	Romania, R Romania Intl	11810pa	11940pa	15335pa	17720pa
		17805pa	21665pa		
0700-0800	Russia, AWR Russia	11835eu			
0700-0800	Russia, Radio Moscow Intl	7345eu	9750eu	11710me	12020af
	12070af 13650me	13705am	15125me	15140af	15190af
	15225am 15225am	15280af	15345af	15420me	15440eu
	15465af 15470af	15520af	15540am	15550af	17560af
	17570af 17580eu	17655af	17660am	17735am	21690af
0700-0800 vl	S Africa, Radio Oranje	9630do			
0700-0800 vl	Sierra Leone, SLBS	3316do			
0700-0800	Singapore, SBC Radio One	5010do	5052do	11940do	
0700-0800	Solomon Islands, SIBC	5020do	9545do		
0700-0800	Swaziland, Trans World R	7200af	11740af		
0700-0800	Taiwan, VO Free China	5950na			
0700-0800 as	Thailand, Radio	4830as	9655as	11905as	
0700-0730	United Kingdom,BBC London	6190af	6195eu	7150pa	7325eu
	9410eu 9640eu	9760eu	11760me	11940af	11950eu
	11955as 12095eu	15070va	15280as	15310as	15325eu
	15360pa 15400af	15420va	15575eu	17640me	17790va
	17830as 17885af	21470me	21660af	21715as	
0700-0800	USA, CSMonitor Boston MA	9455na	9840eu	17555as	17780as
0700-0800	USA, KCBI Dallas TX	13720am			
0700-0800	USA, KTBN Salt Lk City UT	7510na			
0700-0800	USA, KVOH Los Angeles CA	9785na			
0700-0800	USA, WEWN Birmingham AL	9350am	11580am		
0700-0800	USA, WHRI Noblesville IN	7315eu	9495am		
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	5935am	7435am		
0700-0800	USA, WYFR Okeechobee FL	5985va	7355va	9680va	11915af
		13695eu			
0703-0715	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0730-0800	Australia, Radio	6020pa	11720pa	11880pa	15240pa
		17695as	17750as	21595as	25750as
0730-0800	Austria, R Austria Intl	6155eu	13730eu	15450me	17870me
0730-0757	Czech Republic, R Prague	6055eu	11990pa	13600as	17535pa
		17725as	21705pa		
0730-0800	Ecuador, HCJB Quito	9745pa	11835eu	11925pa	15270eu
		17490eu	21455eu		
0730-0745 mtwhf	Iceland, Natl BC Service	9265om			
0730-0800	Italy, AWR Europe	7210eu			
0730-0800	Netherlands, Radio	9630pa	11895pa		
0730-0800	United Kingdom,BBC London	5975na	6190af	6195eu	7150au
	7325eu 9410eu	9640au	9760eu	11760me	11955as
	12095eu 15070va	15280as	15310as	15360as	15400af
	15420va 15575me	17640me	17790va	17830as	17885af
	21470me 21660af	21715as			

0800 UTC [4:00 AM EDT/1:00 AM PDT]

0800-0900	Australia, ABC Brisbane	9660do			
0800-0900	Australia, ABC Perth	15425do			
0800-0830	Australia, Radio	5995pa	6020pa	6080pa	9580pa
	15240pa 17695as	17750pa	21595as	25750as	
0800-0830 vl	Australia, VL8A Alice Spg	4835do			
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900	Bahrain, radio	6010do			
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	Costa Rica,R forPeace Int	7385na	13630am	15030na	
0800-0830	Ecuador, HCJB Quito	9600eu	9745pa	11835eu	11925pa
		17490au	21455eu		
0800-0900	Finland, Radio	17800as	21550as		
0800-0900	Ghana, GBC Radio 1	4915do			
0800-0900 f	Ghana, GBC Radio 2	3366do			
0800-0900 asmtwh	Guam, KTWR Agana	15200as			
0800-0900	Indonesia, Voice of	9675au	11752as		
0800-0900 vl	Italy, IRRS Milano	7125va			
0800-0900	Kenya, Kenya BC Corp	4935do			
0800-0830 vl	Kiribati, Radio	17440do			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0845	Monaco, TWR Monte Carlo	9480eu			
0800-0825	Netherlands, Radio	9630pa	11895pa		
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0900 smtwhf	New Zealand, ZLXA	3935do			
0800-0900	Nigeria, Radio	3326do	4990do		
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0900 vl	PNG, Natl BC	4890do			
0800-0900 vl	PNG, Radio Central	3290do			
0800-0900 vl	PNG, Radio Enga	2410do			
0800-0900 vl	PNG, Radio Milne Bay	3365do			
0800-0900 vl	PNG, Radio Western	3305do			
0800-0900	Russia, Radio Moscow Intl	11765af	12010as	12020as	12055af
	12070as 13650as	15125me	15190eu	15225as	15345me
	15420as 15440me	15470as	15590as	17560af	17645af
	17660af 17675af	17735am	17760am	17805af	17890am
	21450am 21465am	21655af	21690am		
0800-0900 vl	S Africa, Radio Oranje	9630do			
0800-0830 vl	Sierra Leone, SLBS	3316do			
0800-0900	Singapore, SBC Radio One	5010do	5052do	11940do	
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, Radio Korea	7550af	13670eu	15155eu	
0800-0820	Swaziland, Trans World R	7200af	11740af		
0800-0830	United Kingdom,BBC London	6190af	7325eu	9410eu	9640eu
	9660eu 9760eu	11940af	11955as	12095eu	15070va
	15280as 15360as	15400am	15420af	15575af	17640me
	17705eu 17790af	17790af	17830as	17885af	21470af
	21660af 21715pa				
0800-0900	USA, CSMonitor Boston MA	9455sa	9840eu	13615pa	15665pa
		17555as			
0800-0900	USA, KCBI Dallas TX	9815am			
0800-0900	USA, KNLS Anchor Point AK	9615as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, WEWN Birmingham AL	9350am			
0800-0900	USA, WHRI Noblesville IN	7315am	9495am		
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCR Nashville TN	5935am			
0803-0805	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0820-0835 as	Swaziland, Trans World R	7200af	11740af		
0830-0900	Australia, Radio	5995na	9560pa	9580pa	17695as
		21595pa	25750pa		
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0900	Austria, R Austria Intl	6155eu	13730eu		
0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0830-0900	Georgia, Georgian Radio	11920eu			
0830-0900	Netherlands, Radio	11895pa			
0830-0857	Slovakia, R Slovakia Intl	11990au	15605au	17535au	21705au
0830-0900	United Kingdom,BBC London	6190af	7325eu	9410eu	9600eu
	9760eu 11940af	11955as	12095eu	15070va	15280as
	15360pa 15420af	15575af	17640me	17705eu	17790af
	17790af 17830as	17885af	21470af	21660af	21715pa
0830-0845	Vatican State, Vatican R	6245eu	7250eu	9645eu	15210eu
0835-0845 smtwhf	Monaco, TWR Monte Carlo	9480eu			
0850-0900 s	Monaco, TWR Monte Carlo	9480eu			

0900 UTC [5:00 AM EDT/2:00 AM PDT]

0900-0950	Australia, AAF Radio	20418as	25322af		
0900-1000	Australia, ABC Brisbane	4920do	9660do		
0900-1000	Australia, Radio	5995pa	6020pa	6080pa	9510pa
	9580pa 9710pa	13605pa	15170as	21725as	
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Bahrain, Radio	6010do			
0900-0925 mtwhf	Belgium, R Vlaanderen	5910eu	9905eu	13675eu	
0900-1000	Bhutan, BC Service	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, China Radio Intl	11755au	15440au	17710au	
0900-1000	Costa Rica,R forPeace Int	7375am	7385am	13630am	15030am
0900-1000	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	15410af
	17780as 17800af	17820as	21465as	21600af	21650as
	21680as				
0900-0905	Ghana, GBC Radio 1	4915do			
0900-0905 f	Ghana, GBC Radio 2	3366do			
0900-1000	Guam, KTWR Agana	11805pa			
0900-1000 s	Italy, AWR Europe	7230eu			
0900-1000 vl	Italy, IRRS Milano	7125va			
0900-1000	Japan, NHK/Radio Japan	9750pa	11740pa	11815pa	11910pa
		15190pa	17860au		
0900-1000	Kenya, Kenya BC Corp	4935do			
0900-1000 mtwhf	Lebanon, King of Hope	6280me			
0900-1000	Malaysia, RTM Radio 4	7295do			
0900-0915 s	Monaco, TWR Monte Carlo	9480eu			
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-0930 mtwhf	New Zealand, ZLXA	3935do			
0900-1000	Nigeria, Radio	3326do	4990do		
0900-1000 mtwtfa	Palau, KHBN Voice of Hope	9830as			
0900-1000	Philippines, FEBC Manila	11690as			
0900-1000 vl	PNG, Natl BC	4890do			
0900-1000 vl	PNG, Radio Central	3290do			
0900-1000 vl	PNG, Radio Enga	2410do			
0900-1000 vl	PNG, Radio Milne Bay	3365do			
0900-1000 vl	PNG, Radio Western	3305do			
0900-1000	Russia, Radio Moscow Intl	7130af	9755af	11765af	11805as
	12010as 12020as	12055af	12070as	13650as	15190eu
	15345me 15420as	15440af	15470as	15490af	15525as
	17560af 17645af	17660af	17675af	17735am	17760am
	17805af 17890af	21655af	21690am	21825af	
0900-1000 vl	S Africa, Radio Oranje	9630do			
0900-1000	Singapore, SBC Radio One	5010do	5052do	11940do	
0900-1000 vl	Solomon Islands, SIBC	5020do	9545do		
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17670au	21820au
0900-0930	United Kingdom,BBC London	6190af	7325eu	9410eu	9660eu
	9740va 9750eu	9760eu	11750as	11760me	11765as
	11940af 12095eu	15070me	15190sa	15280af	15310as
	15360as 15400af	15420af	15575va	17640me	17705va
	17790va 17830as	17885af	21470af	21660af	21715pa
0900-1000	USA, CSMonitor Boston MA	9455sa	9840eu	13615pa	15665pa
		17555as			
0900-1000	USA, KCBI Dallas TX	9815am			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, WHRI Noblesville IN	7315am	7355am		
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9485eu			
0900-1000	USA, WWCR Nashville TN	5935am			
0905-1000 sa	Ghana, GBC Radio 1	4915do			
0905-1000 mtwhf	Ghana, GBC Radio 2	3366do	7295do		
0905-1000 sa	Ghana, GBC Radio 2	3366do			
0910-0940 smha	Mongolia, R Ulaanbaatar	11850as	12015as		
0915-0930 smtwh	Guam, KTWR Agana	15200as			
0930-1000	Netherlands, Radio	9720pa	11895pa	12065as	15470as
0930-1000	United Kingdom,BBC London	6190af	6195as	9410eu	9660eu
	9740va 9750eu	9760eu	11750as	11760me	11940af
	12095eu 15070me	15190sa	15280as	15310as	15400af
	15420af 15575va	17640me	17705eu	17790va	17830va
	17885af 21470af	21660af	21715pa		
0940-0950	Greece, Voice of	17525au			

1000 UTC [6:00 AM EDT/3:00 AM PDT]

1000-1100	Australia, ABC Brisbane	4920do			
1000-1100	Australia, Radio	5995pa	6020pa	6080pa	9580pa
		9710pa	13605pa	15170as	21725as
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100	Bahrain, Radio	6010do			
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, China Radio Intl	11755au	15440au	17710au	
1000-1100	Costa Rica, AWR Alajuela	9725ca			
1000-1100	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030na
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
1000-1100 sa	Ghana, GBC Radio 1	4915do			
1000-1100 mtwhf	Ghana, GBC Radio 2	7295do			
1000-1100 sa	Ghana, GBC Radio 2	3366do			
1000-1100	India, All India Radio	15050as	17387au	17895as	21735au
1000-1030	Israel, Kol Israel	17545eu			
1000-1100	Italy, AWR Europe	7230eu			
1000-1100 vl	Italy, IRRS Milano	7125va			
1000-1100	Kenya, Kenya BC Corp	4935do			
1000-1100 mtwhf	Lebanon, King of Hope	6280me			
1000-1100 vl	Malaysia, RTM Kota Kinaba	5980do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100 vl	Malaysia, RTM Sarawak	4950do	7160do		
1000-1025	Netherlands, Radio	9720pa	11895pa	12065as	15470as
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, Radio	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1100 mtwhfa	Palau, KHBN Voice of Hope	9830as			
1000-1100	Philippines, FEBC Manila	9800as	11685as		
1000-1100 vl	PNG, Natl BC	4890do			
1000-1100 vl	PNG, Radio Central	3290do			
1000-1100 vl	PNG, Radio Enga	2410do			
1000-1100 vl	PNG, Radio Milne Bay	3365do			
1000-1100 vl	PNG, Radio Western	3305do			
1000-1100	Russia, Radio Moscow Intl	11630eu	11655eu	11765af	11800na
	11940af 12010eu	12020eu	12070eu	15125me	15140eu
	15225na 15350me	15355eu	15470eu	15490as	17595as
	17675af 17760na	17775as	17805af	21655af	
1000-1100	S Africa, Channel Africa	17805af			
1000-1100 vl	S Africa, Radio Oranje	9630do			
1000-1100	Singapore, SBC Radio One	5010do	5052do	11940do	
1000-1045	Switzerland, Swiss R Intl	6165eu	9535eu		
1000-1030	United Kingdom,BBC London	6190af	6195va	9410eu	9660eu
	9740va 9750eu	9760eu	11750as	11760me	11940af
	12095eu 15070va	15190am	15260sa	15310as	15400af
	15420af 15575va	17640va	17705eu	17790va	17830pa
	17885af 21470va	21660af	21715pa		
1000-1100	USA, CSMonitor Boston MA	9455sa	9495na	13625as	17555as
1000-1100	USA, KCBI Dallas TX	9815am			
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, VOA Washington DC	5985as	7405am	9590am	11720as
	11735me 11915am	15120am	15160me	15195eu	15425as
	17770eu 21455eu				
1000-1100	USA, WHRI Noblesville IN	7315am			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5935am	15685am		
1000-1100	USA, WYFR Okeechobee FL	5950am			
1000-1015 mtwhfa	Vatican State, Vatican R	6245eu	7250eu	11740eu	15210eu
		21665eu			
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1003-1006	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
1030-1100	Austria, R Austria Intl	15450au	21490au		
1030-1100	Bulgaria, Radio	13670eu	17760eu	17830eu	
1030-1057	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
		15355eu			
1030-1100	Netherlands, Radio	12065as	15470as		
1030-1100	South Korea, Radio Korea	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1030-1100	UAE, UAE Radio Dubai	13675eu	15320eu	15435eu	21605eu
1030-1100	United Kingdom,BBC London	6190af	6195va	9410eu	9660eu
	9740va 9750eu	9760eu	11750as	11760me	11940af
	12095eu 15070va	15190am	15260sa	15310as	15400af
	15420af 15575va	17640va	17705eu	17790va	17885af
	21470va 21660af				
1040-1050	Greece, Voice of	15650as	17525as		

ICOM™ IC-R7100
Sweeping 1800 Channels/Minute

DELTACOMM™ I-7100 communication manager and your MS-DOS computer gives you a custom interface integrated with optimized software that will not just control but will maximize the potential of your R7100. Here are a few (there are many more) examples of the advanced features DELTACOMM™ I-7100 has to offer.

- DELTACOMM™ I-7100 CYBERSCAN feature for monitoring systems employing cluster or frequency hopping techniques.
- Individually programmable database volume levels (by channel) while scanning.
- Spectrum log function will sweep a frequency spectrum, generate a histogram and log frequency/activity to screen and/or disk in real time.
- Dual squelch detect electronics integrated with DELTACOMM™ I-7100 software guarantees optimum speed and performance during a frequency search or database scan.
- Programmable signal strength threshold limits with full 8-bit accuracy allow selective monitoring and logging. Only stations having signal strength less than or greater than or within upper/lower user defined signal strength window limits will be monitored and/or logged.
- Continously updating activity information window displays the last 19 active channels.
- Channel activity status is displayed in real time with activity log function. To determine system loading when first 5 channels are simultaneously busy, "All Trunks Busy" message is logged to disk.
- Receiver characterization with DELTACOMM™ I-7100 birdie log function automatically logs any receiver birdies prior to a frequency search operation. Birdie channels are then locked out during a frequency search operation, thus eliminating false channel logging.
- Custom interface allows selective program control of relay contact. Possible uses include activating an operator alert, switching antennas via coax relay or turning on a tape recorder when user defined frequencies are found to be active.

DELTACOMM™ I-7100 communication manager comes complete with Delta Research custom (CI-V) communication interface, UL listed power supply, manual and receiver interface cable for $349.00 + $8.00 (U.S.) or $25.00 (foreign) S&H. Contact us for additional information on DELTACOMM™ communication managers for ICOM™ R7000, R71A, R72 and IC735. Performance is proportional to video card, type of computer and receiver squelch detection method.

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- ***50 CTCSS TONES (Analog)***
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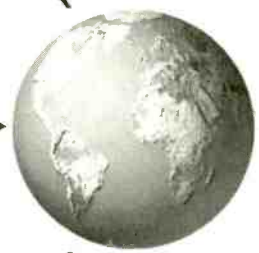

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1100 UTC [7:00 AM EDT/4:00 AM PDT]

FREQUENCIES

1100-1200	Australia, ABC Brisbane	4920do			
1100-1200	Australia, Radio	5995pa	6020pa	6080pa	7240pa
		9510pa	9580pa	9710pa	13605pa
		15170as	21745as		
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1200	Bahrain, Radio	6010do			
1100-1200	Bulgaria, Radio	13670eu	17760eu	17830eu	
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	Costa Rica, AWR Alajuela	9722ca	11870ca		
1100-1200	Costa Rica,R forPeace Int	7385na	13630na	15030na	
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
1100-1150	Germany, Deutsche Welle	15370af	15410af	17715af	17765af
		17800af	17860af	21465af	21600af
1100-1200	Ghana, GBC Radio 1	4915do			
1100-1110 mtwhf	Ghana, GBC Radio 2	7295do			
1100-1200 sa	Ghana, GBC Radio 2	3366do			
1100-1200 vl	Italy, IRRS Milano	7125va			
1100-1200	Japan, NHK/Radio Japan	6120na	11910na	15240na	
1100-1200	Jordan, Radio	13655eu			
1100-1200 vl	Malaysia, RTM Kota Kinaba	5980do			
1100-1200	Malaysia, RTM Radio 4	4950do	7295do		
1100-1200 vl	Malaysia, RTM Sarawak	4950do	7160do		
1100-1130	Mozambique, R Mocambique	11820af	11835af		
1100-1125	Netherlands, Radio	12065as	15470as		
1100-1200	New Zealand, R NZ Intl	9700as			
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na	
1100-1200 mtwhf	Palau, KHBN Voice of Hope	9830as			
1100-1200 vl	PNG, Natl BC	4890do			
1100-1200 vl	PNG, Radio Central	3290do			
1100-1200 vl	PNG, Radio Enga	2410do			
1100-1200 vl	PNG, Radio Milne Bay	3365do			
1100-1200 vl	PNG, Radio Western	3305do			
1100-1200	Russia, Radio Moscow Intl	11765me	11785me	11800me	13650na
		15125as	15130as	15140me	15155as
		15225me	15280me	15290as	15355na
		15405as	15420as	15490me	15540as
		17570na	17660me	17670me	17675na
		17735as	17755me	17760na	17780me
		17815as	17875as	21785as	
1100-1200	S Africa, Channel Africa	9730af			
1100-1200 vl	S Africa, Radio Oranje	9630do			
1100-1200	Singapore, SBC Radio One	5010do	5052do	11940do	
1100-1200	South Korea, Radio Korea	6145na	9650na	9980na	
1100-1130	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1100-1130	Switzerland, Swiss R Intl	13635as	15505as	17670as	17670as
		21820as			
1100-1200	Taiwan, Voice of Asia	7445as			
1100-1130	United Kingdom,BBC London	5965na	6190af	6195va	9410eu
		9515na	9600eu	9700au	9740va
		9750eu	9760eu	11750as	11760me
		11940af	12095eu	15070va	15220na
		15310as	15400eu	15420af	15575me
		17640va	17705eu	17790af	17885va
		21470va	21660af		
1100-1200	USA, CSMonitor Boston MA	9455sa	9495na	13625as	17555as
1100-1200	USA, KCBI Dallas TX	9815am			
1100-1200	USA, KTBN Salt Lk City UT	7510na			
1100-1200	USA, VOA Washington DC	5985as	6110as	7405am	9590am
		9760as	11720as	11915am	15120am
		15160as	15425as		
1100-1200	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200	USA, WWCR Nashville TN	5935am	15685am		
1100-1200	USA, WYFR Okeechobee FL	5950na	7355na	11830na	
1100-1130	Vietnam, Voice of	7287as	9730as		
1130-1200	Austria, R Austria Intl	6155eu	13730eu		
1130-1200 s	Belgium, R Vlaanderen	15540as	17540as		
1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1130-1150 mtwhf	Finland, Radio	11735na	15400na		
1130-1200	Iran, VOIRI Tehran	9525me	11715me	11790me	11910as
		11930as			
1130-1200	Netherlands, Radio	5955eu	9860eu		
1130-1200	Serbia, Radio Yugoslavia	21605au			
1130-1200	Thailand, Radio	4830as	9655as	11905as	
1130-1200	United Kingdom,BBC London	5965na	6190af	6195va	9410eu
		9515na	9600eu	9740va	9750eu
		9760eu	11750as	11760me	11940af
		12095eu	15070va	15220na	15310as
		15420af	15575me	17640af	17695as
		17705eu	17790af	17885va	21470va
		21660af			

SELECTED PROGRAMS

Sundays

1109 Deutsche Welle: Arts On The Air. Reports and interviews on cultural events and developments.
1115 Radio Japan: Hello From Tokyo. See S 0315.
1130 BBC: The John Dunn Show. See S 0030.
1130 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
1134 Deutsche Welle: German By Radio. See S 0134.
1155 Radio Japan: Viewpoint. See S 0355.

Mondays

1109 Deutsche Welle: Newsline Cologne. A current affairs program with worldwide reports and a German press review.
1130 BBC: Composer Of The Month. See M 0230.
1130 Radio Japan: People. See M 0330.
1134 Deutsche Welle: Hello Africa. Musical requests and greetings to friends.
1135 Radio Austria Int'l: Report From Austria. See S 0135.
1150 Radio Japan: Commentary. See M 0350.

Tuesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1130 BBC: Megamix. Music, sports, fashion, health, travel, news, and opinion for young people.
1130 Radio Japan: World Update. See T 0330.
1134 Deutsche Welle: Hello Africa. See M 1134.
1135 Radio Austria Int'l: Report From Austria. See S 0135.
1150 Radio Japan: Commentary. See M 0350.

Wednesdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1115 Radio Jordan: Jordan Weekly. See T 1115.
1130 BBC: Meridian. See W 0630.
1130 Radio Japan: Asia Plaza. See W 0330.
1134 Deutsche Welle: Hello Africa. See M 1134.
1135 Radio Austria Int'l: Report From Austria. See S 0135.
1150 Radio Japan: Commentary. See M 0350.

Thursdays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1130 BBC: Drama. This month: "Shopping" (7th); "Clean Slate" (14th); "Runyon's Guys And Dolls" (21st, 28th).
1130 Radio Japan: Crosscurrents. See H 0330.
1134 Deutsche Welle: Hello Africa. See M 1134.
1135 Radio Austria Int'l: Report From Austria. See S 0135.
1150 Radio Japan: Commentary. See M 0350.

Fridays

1109 Deutsche Welle: Newsline Cologne. See M 1109.
1130 BBC: Meridian. See W 0630.
1130 Radio Japan: Techno-Business. See F 0330.
1134 Deutsche Welle: Hello Africa. See M 1134.
1135 Radio Austria Int'l: Report From Austria. See S 0135.
1150 Radio Japan: Commentary. See M 0350.

Saturdays

1109 Deutsche Welle: Africa This Week. A review of trends and events on the African continent.
1115 Radio Japan: This Week. See S 0115.
1130 BBC: Meridian. See W 0630.
1130 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
1134 Deutsche Welle: Mailbag Africa. Listeners' questions, music requests, and the club corner.

1200 UTC [8:00 AM EDT/5:00 AM PDT]

FREQUENCIES

1200-1300	Australia, AAF Radio	12070as			
1200-1300	Australia, ABC Brisbane	4920do			
1200-1300	Australia, ABC Perth	6140do	9610do		
1200-1230	Australia, Radio	5995pa	6020pa	6080pa	7240pa
		9580pa	9710pa	21745as	
1200-1300 vl	Australia, VL8A Alice Spg	2310do			
1200-1300 vl	Australia, VL8K Katherine	2485do			
1200-1300 vl	Australia, VL8T Tent Crk	2325do			
1200-1300	Bahrain, Radio	6010do			
1200-1300	Brazil, Radiobras	15445am			
1200-1215	Cambodia, Natl Voice of	11938as			
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			
1200-1259 mtwhf	Canada, RCI Montreal	9635na	11855na	17820na	
1200-1300	China, China Radio Intl	8425as	9715as	11600as	11660as
		11795as	15210na	15440na	15450na
1200-1300	Costa Rica, AWR Alajuela	9725ca	11870ca		
1200-1300	Costa Rica,R forPeace Int	7385am	15030na	21465am	
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455om			
1200-1300	Ghana, GBC Radio 1	4915do			
1200-1225 sa	Ghana, GBC Radio 2	3366do			
1200-1230	Iran, VOIRI Tehran	9525me	11715me	11790me	11910as
		11930as			
1200-1300 vl	Italy, IRRS Milano	7125eu			
1200-1300	Kenya, Kenya BC Corp	4935do			
1200-1230 mtwhf	Lebanon, King of Hope	6280me			
1200-1300 vl	Malaysia, RTM Kota Kinaba	5980do			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1300 vl	Malaysia, RTM Sarawak	4950do			
1200-1230 smwha	Mongolia, R Ulaanbaatar	11850as	12015as		
1200-1206	New Zealand, R NZ Intl	9700as			
1200-1300	Nigeria, Radio	4990do	7285do		
1200-1230 s	Norway, Radio Norway Intl	17730as	17840as		
1200-1300 mtwhf	Palau, KHBN Voice of Hope	9830as			
1200-1230 a	Palau, KHBN Voice of Hope	9830as			
1200-1300 vl	PNG, Natl BC	4890do			
1200-1300 vl	PNG, Radio Central	3290do			
1200-1300 vl	PNG, Radio Enga	2410do			
1200-1300 vl	PNG, Radio Milne Bay	3365do			
1200-1300 vl	PNG, Radio Western	3305do			
1200-1255	Poland, Polish R Warsaw	6135eu	7145eu	9525eu	11815eu
1200-1300	Russia, Radio Moscow Intl	11765af	11785af	11800me	15140as
		15155as	15170me	15220am	15225as
		15280na	15290as	15320me	15355as
		15440me	15480as	15490na	15540na
		15550me	17570na	17595na	17645na
		17670na	17675af	17760na	17765me
		17790na	17815me	21785me	
1200-1300 vl	S Africa, Radio Oranje	9630do			
1200-1300	Singapore, SBC Radio One	5010do	5052do	11940do	
1200-1300	South Korea, Radio Korea	9640na			
1200-1230	Thailand, Radio	4830as	9655as	11905as	
1200-1230	United Kingdom,BBC London	6190af	6195na	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11750as	11760me	11940af	12095eu
		15070va	15220na	15310as	15575va
		17640af	17705eu	17790af	17885af
		21470af	21660af		
1200-1215	United Kingdom,BBC London	7160as	9605as	11920as	
1200-1300	USA, CSMonitor Boston MA	9425pa	9495na	13625as	13760sa
1200-1300 as	USA, CSMonitor Boston MA	15665eu			
1200-1300	USA, KCBI Dallas TX	9815am			
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, VOA Washington DC	6110as	9760as	11715as	15160as
		15425as			
1200-1300	USA, WEWN Birmingham AL	9350am	15695am		
1200-1300	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300	USA, WWCR Nashville TN	13845am	15685am		
1200-1300	USA, WYFR Okeechobee FL	5950am	6015am	11830am	17750am
1200-1225	Uzbekhistan, R Tashkent	7285as	9715as	15295as	17815as
1207-1300 ocasnal	New Zealand, R NZ Intl	9510as			
1215-1300	Egypt, Radio Cairo	17595as			
1226-1300	Ghana, GBC Radio 2	7295do			
1230-1300	Australia, Radio	5995pa	6020pa	7240pa	9580pa
		13755pa			
1230-1300	Bangladesh, Radio	11708eu	13610eu	13620eu	15200eu
1230-1259	Canada, RCI Montreal	9660as	15195as		
1230-1300	Finland, Radio	11900na	15400na		
1230-1255	France, Radio France Intl	9805eu	11670eu	15155eu	15195eu
		15365na	17575na		
1230-1300	Netherlands, Radio	5955eu	9860eu		
1230-1300	Sri Lanka, SLBC Colombo	6075as	9720as		
1230-1300	Sweden, Radio	15240pa	21500as		
1230-1300	Turkey, Voice of	9675as			
1230-1300	United Kingdom,BBC London	6190af	6195na	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11750as	11760me	11940af	12095eu
		15070va	15220na	15310as	15575va
		17640af	17705eu	17790af	17885af
		21470af	21660af		
1230-1300	Vietnam, Voice of	9840as	12020as	15010as	

SELECTED PROGRAMS

Sundays

1201 BBC: Play Of The Week. See S 0101.
1205 Radio Norway Int'l: Norway Now. Commentary and features on issues and people in Norway.
1215 Radio Korea: Echoes Of Korean Music. See S 0615.
1235 Radio Korea: Shortwave Feedback. See S 0635.

Mondays

1209 BBC: Words Of Faith. Speakers from various faiths discuss scripture and their beliefs.
1215 BBC: Quiz. Mark Steyn hosts a celebrity game show on musicals in "Let's Do The Show Right Here."
1215 Radio Korea: News Commentary. See S 0115.
1220 Radio Korea: Seoul Calling. See M 0620.
1240 Radio Korea: Tales From Korea's Past. See M 0640.
1245 BBC: Sports Roundup. See S 0315.

Tuesdays

1209 BBC: Words Of Faith. See M 1209.
1215 BBC: Multitrack 1. See M 2330.
1215 Radio Korea: News Commentary. See S 0115.
1220 Radio Korea: Seoul Calling. See M 0620.
1240 Radio Korea: Korean Cultural Trails. See T 0640.
1245 BBC: Sports Roundup. See S 0315.

Wednesdays

1209 BBC: Words Of Faith. See M 1209.
1215 BBC: New Ideas. See M 1615.
1215 Radio Korea: News Commentary. See S 0115.
1220 Radio Korea: Seoul Calling. See M 0620.
1235 BBC: Talks. See M 1635.
1240 Radio Korea: Pulse Of Korea. See W 0640.
1245 BBC: Sports Roundup. See S 0315.

Thursdays

1209 BBC: Words Of Faith. See M 1209.
1215 BBC: Multitrack 2. See W 2330.
1215 Radio Korea: News Commentary. See S 0115.
1220 Radio Korea: Seoul Calling. See M 0620.
1230 Radio Korea: Korean Literary Corner. See H 0630.
1240 Radio Korea: Forward To Reunification. See H 0640.
1245 BBC: Sports Roundup. See S 0315.

Fridays

1209 BBC: Words Of Faith. See M 1209.
1215 BBC: Feature. Gambling is the subject of "The Green Baize Jungle" (1st, 8th); America's police feature in "The World's Policeman" (15th, 22nd, 29th).
1215 Radio Korea: News Commentary. See S 0115.
1220 Radio Korea: Let's Sing Together. See F 0620.
1240 Radio Korea: Let's Learn Korean. See F 0640.
1245 BBC: Sports Roundup. See S 0315.

Saturdays

1209 BBC: Words Of Faith. See M 1209.
1215 BBC: Multitrack 3. See F 2330.
1215 Radio Korea: News Commentary. See S 0115.
1220 Radio Korea: Sites And Sounds. See S 0120.
1235 Radio Korea: From Us To You. See S 0135.
1245 BBC: Sports Roundup. See S 0315.

English language

shortwave guide

1300 UTC [9:00 AM EDT/6:00 AM PDT]

FREQUENCIES

1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, Radio	5995pa	7240pa	9580pa	11800pa
		11855as	13755as		
1300-1400 vl	Australia, VL8A Alice Spg	2310do			
1300-1400 vl	Australia, VL8K Katherine	2485do			
1300-1400 vl	Australia, VL8T Tent Crk	2325do			
1300-1400	Bahrain, Radio	6010do			
1300-1330 mtwtfs	Belgium, R Vlaanderen	15540na	17540as		
1300-1320	Brazil, Radiobras	15445am			
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	11955na	17820na		
1300-1400	China, China Radio Intl	9405as	9715as	11660pa	11855as
1300-1400	Costa Rica,R forPeace Int	7385am	15030na	21465am	
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400 as	Finland, Radio	15400na	21550na		
1300-1325	Israel, Kol Israel	11587na	11603na	15640na	15650as
		17575eu	17590eu		
1300-1400 vl	Italy, IRRS Milano	7125va			
1300-1325	Kenya, Kenya BC Corp	4935do			
1300-1400 vl	Malaysia, RTM Kota Kinaba	5980do			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1400 vl	Malaysia, RTM Sarawak	4950do			
1300-1400	Nigeria, Radio	4990do	7285do		
1300-1350	North Korea, R Pyongyang	9345eu	9640as	11740as	15230as
1300-1330 m	Norway, Radio Norway Intl	9590eu	15230eu		
1300-1400 mtwhf	Palau, KHBN Voice of Hope	9830as			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1400 vl	PNG, Natl BC	4890do			
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	17850eu
1300-1400	Russia, AWR Russia	11855au			
1300-1400	Russia, Radio Moscow Intl	9640am	9755am	9825am	9885am
		9895am	11940eu	11995as	15140me
		15225na	15280as	15290as	15335as
		15355me	15480as	15550as	17595as
		17735me	17760as	17790as	17860me
		21610as	21625me	21785me	
1300-1400 vl	S Africa, Radio Oranje	9630do			
1300-1400	Singapore, SBC Radio One	5010do	5052do	11940do	
1300-1330	South Korea, Radio Korea	9750as	13670as		
1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as		
1300-1330	Switzerland, Swiss R Intl	3	7480as	11690as	13635as
		15505as	17670as	21770as	
1300-1330	United Kingdom,BBC London	6190af	6195va	7180pa	9410eu
		9515na	9660eu	9740am	9750eu
		9760eu	11750as	11760me	11820am
		11940af	12095eu	15070am	15105af
		15220am	15250as	15310as	15420af
		15575me	17640af	17705eu	17790af
		17885af	21470af	21660af	
1300-1400	USA, CSMonitor Boston MA	9425pa	9495na	13625as	13760sa
1300-1400 as	USA, CSMonitor Boston MA	15665eu			
1300-1400	USA, KNLS Anchor Point AK	7355as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400	USA, VOA Washington DC	6110as	9760as	11715as	15160as
		15425as			
1300-1400	USA, WEWN Birmingham AL	9350na			
1300-1400	USA, WHRI Noblesville IN	9465na	11790na		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WWCR Nashville TN	13845am	15685am		
1300-1400	USA, WYFR Okeechobee FL	5950na	6015na	11830na	13695na
		17750na			
1302-1400	Taiwan, VO Free China	11550as			
1315-1325	Nepal, Radio	3230do	5005do	7165do	
1325-1400 mtwhf	Kenya, Kenya BC Corp	4935do			
1330-1400	Austria, R Austria Intl	15450as			
1330-1359	Canada, RCI Montreal	9535as	11795as	11935eu	15315eu
		15325eu	17820eu	17895af	21455eu
		21710eu			
1330-1400 mtwhf	Finland, Radio	11900na	15400na	21550na	
1330-1400	India, All India Radio	11760as	15120as		
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands, Radio	9890as	13700as	15150as	17160as
1330-1400	UAE, UAE Radio Dubai	13675eu	15320eu	15435as	21605as
1330-1400	United Kingdom,BBC London	6190af	6195va	7180pa	9410eu
		9515na	9660eu	9740va	9750eu
		9760eu	11750as	11760me	11820va
		11940af	12095eu	15070va	15220am
		15250as	15310as	15420af	15575me
		17640va	17705eu	17790va	17885af
		21470va	21660af		
1330-1345	United Kingdom,BBC London	15105af	17810af	21640af	
1330-1355	Uzbekhistan, R Tashkent	7285as	9715as	15295as	17815as
1330-1400	Vietnam, Voice of	9840as	15010as		
1335-1345	Greece, Voice of	15630na	17515na		
1345-1400	Vatican State, Vatican R	15090as	17525as		

SELECTED PROGRAMS

Sundays

1300 KNLS: Variety Style. Music, features, listener letters, and religious messages.
1305 Radio Norway Int'l: Norway Now. See S 1205.
1310 Kol Israel: Israel Sound. The latest pop and rock tunes from Israel.
1315 Radio Korea: Echoes Of Korean Music. See S 0615.
1325 Kol Israel: Postmark. Recent Israeli stamp releases.
1330 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
1335 Radio Korea: Shortwave Feedback. See S 0635.

Mondays

1300 KNLS: Variety Style. See S 1300.
1310 Kol Israel: Calling All Listeners. A mailbag program.
1315 Radio Korea: News Commentary. See S 0115.
1320 Radio Korea: Seoul Calling. See M 0620.
1325 Kol Israel: DX Corner. Ben Dalfen presents shortwave radio news.
1335 Radio Austria Int'l: Report From Austria. See S 0135.
1340 Radio Korea: Tales From Korea's Past. See M 0640.

Tuesdays

1300 KNLS: Variety Style. See S 1300.
1310 Kol Israel: Israel Mosaic. A weekly magazine program.
1315 Radio Korea: News Commentary. See S 0115.
1320 Radio Korea: Seoul Calling. See M 0620.
1325 Kol Israel: New From Israel. A look at the worlds of science and technology.
1335 Radio Austria Int'l: Report From Austria. See S 0135.
1340 Radio Korea: Korean Cultural Trails. See T 0640.

Wednesdays

1300 KNLS: Variety Style. See S 1300.
1303 Radio Jordan: Old Favorites. See S 1303.
1310 Kol Israel: Talking Point. Interviews with guests in the Kol Israel studios.
1315 Radio Korea: News Commentary. See S 0115.
1320 Radio Korea: Seoul Calling. See M 0620.
1335 Radio Austria Int'l: Report From Austria. See S 0135.
1340 Radio Korea: Pulse Of Korea. See W 0640.

Thursdays

1300 KNLS: Variety Style. See S 1300.
1310 Kol Israel: Jewish News Review. A look at events affecting Jews around the world.
1315 Kol Israel: This Land. Travel and tourism in Israel.
1315 Radio Korea: News Commentary. See S 0115.
1320 Radio Korea: Seoul Calling. See M 0620.
1330 Radio Korea: Korean Literary Corner. See H 0630.
1335 Radio Austria Int'l: Report From Austria. See S 0135.
1340 Radio Korea: Forward To Reunification. See H 0640.

Fridays

1300 KNLS: Variety Style. See S 1300.
1315 Radio Korea: News Commentary. See S 0115.
1320 Radio Korea: Let's Sing Together. See F 0620.
1335 Radio Austria Int'l: Report From Austria. See S 0135.
1340 Radio Korea: Let's Learn Korean. See F 0640.

Saturdays

1300 KNLS: Variety Style. See S 1300.
1315 Radio Korea: News Commentary. See S 0115.
1320 Radio Korea: Sites And Sounds. See S 0120.
1330 Radio Austria Int'l: Austrian Coffee Table. See S 0330.
1335 Radio Korea: From Us To You. See S 0135.

1400 UTC [10:00 AM EDT/7:00 AM PDT]

FREQUENCIES

1400-1450	Australia, AAF Radio	10815as	13508af			
1400-1500	Australia, ABC Brisbane	4920do				
1400-1500	Australia, ABC Perth	6140do				
1400-1500	Australia, Radio	5995pa	6060pa	7240pa	7260as	
	9510as 9580pa	9770as	11800pa	11855as	13755as	
1400-1500 vl	Australia, VL8A Alice Spg	2310do				
1400-1500 vl	Australia, VL8K Katherine	2485do				
1400-1500 vl	Australia, VL8T Tent Crk	2325do				
1400-1500	Bahrain, Radio	6010do				
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	11955na	17820na			
1400-1500 mtwhfa	Canada, RCI Montreal	11935eu	15315eu	15325eu	17820eu	
		17895eu	21455eu	21710eu		
1400-1500	China, China Radio Intl	4200as	7405as	11815na	11855as	
		15165as				
1400-1500	Costa Rica,R forPeace Int	7385am	15030am			
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am	
		21455am				
1400-1500	France, Radio France Intl	11910as	17575eu	17650me	17695eu	
1400-1500	Ghana, GBC Radio 1	4915do				
1400-1500	Ghana, GBC Radio 2	7295do				
1400-1500 mtwhfa	Honduras, R Copan Intl	15675am				
1400-1500	India, All India Radio	11760as	15120as			
1400-1500 vl	Italy, IRRS Milano	7125va				
1400-1500	Japan, NHK/Radio Japan	9535am	9750am	11735as	11815as	
		11865am				
1400-1500	Jordan, Radio 9560eu					
1400-1500 mtwhf	Kenya, Kenya BC Corp	4935do				
1400-1500 vl	Malaysia, RTM Kota Kinaba	5980do				
1400-1500	Malaysia, RTM Radio 4	7295do				
1400-1500 vl	Malaysia, RTM Sarawak	4950do				
1400-1500	Malta, V of Mediterranean	11925eu				
1400-1500 mtwhf	Morocco, RTV Marocaine	17595af				
1400-1500	Netherlands, Radio	9890as	13770as	15150as	17610as	
1400-1430 mtwhf	Palau, KHBN Voice of Hope	9830as				
1400-1500	Philippines, FEBC Manila	11995as				
1400-1500 vl	PNG, Natl BC	4890do				
1400-1500	Russia, Radio Moscow Intl	7315as	9640am	9755am	9825am	
	9895am	11665me	11705as	11870as	11940as	11995am
	15110as	15125af	15140as	15225am	15290am	15320af
	15355as	15480as	17580af	17595af	17760am	17790am
	17890af	21785as				
1400-1500 vl	S Africa, Radio Oranje	9630do				
1400-1500	Singapore, SBC Radio One	5010do	5052do	11940do		
1400-1500	South Korea, Radio Korea	5975as	6135as			
1400-1500	Sri Lanka, SLBC Colombo	6075as	9720as			
1400-1430	United Kingdom,BBC London	6195as	7180as	9410eu	9515na	
	9660eu 9740as	9750eu	9760eu	11750as	11820as	
	11940af 12095eu	15070va	15250as	15260af	15310as	
	15575me 17640va	17705eu	17790af	17840am	17880af	
	21490va 21660af					
1400-1500	USA, CSMonitor Boston MA	9530as	13625as	13760am	15665eu	
1400-1500 sa	USA, CSMonitor Boston MA	13710na				
1400-1500	USA, KCBI Dallas TX	15375va				
1400-1500	USA, KJES Mesquite NM	11715na				
1400-1500	USA, KTBN Salt Lk City UT	7510na				
1400-1500	USA, VOA Washington DC	6110as	7125as	9645as	9760as	
		15160as	15255as	15395as	15425as	
1400-1500	USA, WEWN Birmingham AL	9350na				
1400-1500	USA, WHRI Noblesville IN	9465na	15105na			
1400-1500	USA, WJCR Upton KY	7490na	13595na			
1400-1500	USA, WWCR Nashville TN	13845am	15685am			
1400-1500	USA, WYFR Okeechobee FL	6015am	11550as	11830am	17750na	
1400-1405	Vatican State, Vatican R	15090au	17525au			
1415-1500	Bhutan, BC Service	5025do				
1415-1425	Nepal, Radio	3230do	5005do	7165do		
1430-1500	Afghanistan, Radio	7200as				
1430-1500	Albania, R Tirana Intl	7155eu	9760eu			
1430-1500	Austria, R Austria Intl	6155eu	13730eu	15450eu	21490va	
1430-1500	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am	
1430-1500 m	Indonesia, RRI Padang	4003pa				
1430-1500	Myanmar, VO Myanmar	5990do				
1430-1500 mtwhf	Portugal, Radio	21515me				
1430-1500	Romania, R Romania Intl	11775as	15335as	17720as		
1430-1500 vl	Uganda, Radio	4976do				
1430-1500	United Kingdom,BBC London	6190af	6195as	7180as	9410eu	
	9515na 9660eu	9740as	9750eu	9760eu	11750as	
	11820as 11860me	11940af	12095eu	15070eu	15250as	
	15260me 15310as	15575me	17640va	17705eu	17790af	
	17840am 17880af	21470va	21660af			
1445-1500 smha	Mongolia, R Ulaanbaatar	13780as				

SELECTED PROGRAMS

Sundays

1401 BBC: Feature. This month: "Pilgrimages Of Hope" (3rd, 10th); "State Of The States Phone-In" (17th); "Making America" (24th, 31st).
1415 Radio Japan: Let's Learn Japanese. See S 0515.
1415 Radio Korea: Echoes Of Korean Music. See S 0615.
1430 BBC: Anything Goes. Bob Holness presents a variety of musical requests.
1430 Radio Japan: Media Roundup. See S 0530.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1435 Radio Korea: Shortwave Feedback. See S 0635.
1455 Radio Japan: Viewpoint. See S 0355.

Mondays

1405 BBC: Outlook. Conversation, controversy, and color from the UK and the world.
1415 Radio Japan: Spectrum. See M 0515.
1415 Radio Korea: News Commentary. See S 0115.
1420 Radio Korea: Seoul Calling. See M 0620.
1430 BBC: Off The Shelf. See M 0430.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1440 Radio Korea: Tales From Korea's Past. See M 0640.
1445 BBC: Feature. See S 0445.
1450 Radio Japan: Commentary. See M 0350.
1455 Radio Japan: Tokyo Pop-In. See M 0555.

Tuesdays

1405 BBC: Outlook. See M 1405.
1415 Radio Japan: Enjoy Japanese. See T 0515.
1415 Radio Korea: News Commentary. See S 0115.
1420 Radio Korea: Seoul Calling. See M 0620.
1430 BBC: Off The Shelf. See M 0430.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1440 Radio Korea: Korean Cultural Trails. See T 0640.
1445 BBC: Musical Feature. See M 0145.
1450 Radio Japan: Commentary. See M 0350.
1455 Radio Japan: Tokyo Pop-In. See M 0555.

Wednesdays

1400 Radio Jordan: A Personal File. Anton Halaby chats with personalities from Jordan and abroad.
1405 BBC: Outlook. See M 1405.
1415 Radio Japan: Spectrum. See M 0515.
1415 Radio Korea: News Commentary. See S 0115.
1420 Radio Korea: Seoul Calling. See M 0620.
1430 BBC: Off The Shelf. See M 0430.
1430 Radio Jordan: Pop Session. See S 1430.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1440 Radio Korea: Pulse Of Korea. See W 0640.
1445 BBC: Good Books. This month: Hardy's "Tess Of The D'Urbervilles" (6th); Flaubert's "Madame Bovary" (13th); Austen's "Pride And Prejudice" (20th); Mitchell's "Gone With The Wind" (27th).
1450 Radio Japan: Commentary. See M 0350.
1455 Radio Japan: Tokyo Pop-In. See M 0555.

Thursdays

1405 BBC: Outlook. See M 1405.
1415 Radio Japan: The Travel And Book Beat. See H 0515.
1415 Radio Korea: News Commentary. See S 0115.
1420 Radio Korea: Seoul Calling. See M 0620.
1430 BBC: Off The Shelf. See M 0430.
1430 Radio Korea: Korean-Literary Corner. See H 0630.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1440 Radio Korea: Forward To Reunification. See H 0640.
1445 BBC: The Learning World. See M 0615.
1450 Radio Japan: Commentary. See M 0350.
1455 Radio Japan: Tokyo Pop-In. See M 0555.

Fridays

1405 BBC: Outlook. See M 1405.
1415 Radio Japan: Music Mix. See F 0515.
1415 Radio Korea: News Commentary. See S 0115.
1420 Radio Korea: Let's Sing Together. See F 0620.
1430 BBC: Off The Shelf. See M 0430.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1440 Radio Korea: Let's Learn Korean. See F 0640.
1445 BBC: Global Concerns. See F 0145.
1450 Radio Japan: Commentary. See M 0350.
1455 Radio Japan: Tokyo Pop-In. See M 0555.

Saturdays

1401 BBC: Sportsworld. Extensive coverage and results from all the weekend's sports.
1415 Radio Japan: This Week. See S 0115
1415 Radio Korea: News Commentary. See S 0115.
1420 Radio Korea: Sites And Sounds. See S 0120.
1435 Radio Austria Int'l: Report From Austria. See S 0135.
1435 Radio Korea: From Us To You. See S 0135.

English language

shortwave guide

1500 UTC [11:00 AM EDT/8:00 AM PDT]

FREQUENCIES

1500-1600	Australia, ABC Brisbane	6140do				
1500-1530	Australia, Radio	5995pa	6060pa	7260as	9510as	
	9580pa 9770as	11690as	11800pa	11855as	13755as	
1500-1600 vl	Australia, VL8A Alice Spg	2310do				
1500-1600 vl	Australia, VL8K Katherine	2485do				
1500-1600 vl	Australia, VL8T Tent Crk	2325do				
1500-1600	Bahrain, Radio	6010do				
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				
1500-1559 s	Canada, RCI Montreal	11955na	17820na			
1500-1600	China, China Radio Intl	4200as	11815as	15165as		
1500-1600	Costa Rica,R forPeace Int	7385am	15030am			
1500-1527	Czech Republic, R Prague	6055eu	7345eu	13600me	15535af	
		15805af	17535eu			
1500-1600	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am	
1500-1600	Ethiopia, Voice of	7165do	9560do			
1500-1550	Germany, Deutsche Welle	7185af	9735af	11965af	13610af	
		17735af	21600as			
1500-1600	Guam, KTWR Agana	15610as				
1500-1600 vl	Italy, IRRS Milano	7125va				
1500-1600	Japan, NHK/Radio Japan	9750as	11815as	11865na	15355af	
1500-1600	Jordan, Radio	9560eu				
1500-1600 vl	Malaysia, RTM Kota Kinaba	5980do				
1500-1600	Malaysia, RTM Radio 4	7295do				
1500-1600 vl	Malaysia, RTM Sarawak	4950do				
1500-1600	Malta, V of Mediterranean	11925eu				
1500-1513 smha	Mongolia, R Ulaanbaatar	13780as				
1500-1600	Myanmar, VO Myanmar	5990do				
1500-1600	Netherlands, Radio	9890as	13770as	15150as	17610as	
1500-1600	Nigeria, Radio	4990do	7285do			
1500-1600	Nigeria, Voice of	7255af				
1500-1600	North Korea, R Pyongyang	9325eu	9640af	9977af	13785eu	
1500-1600	Philippines, FEBC Manila	11995as				
1500-1600 vl	PNG, Natl BC	4890do				
1500-1555	Poland, Polish R Warsaw	7285eu	9525eu	11840eu		
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as		
1500-1600	Russia, Radio Moscow Intl	9505am	9640am	9755am	9825am	
	9895na	11665me	11995me	12030me	15125as	15170me
	15180as	15290as	15355as	15425as	15480as	15550am
	17580me	17735me	17760am	17790am		
1500-1600 vl	S Africa, Radio Oranje		4875do			
1500-1555 s	Seychelles, FEBA Radio		11710as			
1500-1600	Seychelles, FEBA Radio		9810af	15330af		
1500-1600	Singapore, SBC Radio One		5010do	5052do	11940do	
1500-1600	Sri Lanka, SLBC Colombo		6075as	9720as		
1500-1530	Sweden, Radio		15190na	15240na	21500na	
1500-1530	Switzerland, Swiss R Intl		13635af	15505af	17670af	21770af
1500-1600 vl	Uganda, Radio		4976do			
1500-1530	United Kingdom,BBC London		6190af	6195eu	7180as	9410eu
	9515na	9740va	9750eu	9760eu	11750as	11940af
	12095eu	15070va	15250as	15260na	15310as	15400eu
	17705eu	17840au	17860af	17880af	21470af	21660af
1500-1600	USA, CSMonitor Boston MA		9530as	13625as	13760am	15665eu
1500-1600	USA, KCBI Dallas TX		15375am			
1500-1600	USA, KTBN Salt Lk City UT		15590na			
1500-1600	USA, VOA Washington DC		6110as	7125as	9645as	9700as
	9760as	15205eu	15255as	15395as	19379eu	
1500-1600	USA, WEWN Birmingham AL		17510am	17535am		
1500-1600	USA, WHRI Noblesville IN		9465sa	15105na		
1500-1600	USA, WJCR Upton KY		7490na	13595na		
1500-1600	USA, WRNO New Orleans LA			15420na		
1500-1600	USA, WWCR Nashville TN		13845am	15685am		
1500-1600	USA, WYFR Okeechobee FL		6015na	11705na	11830na	17750na
1520-1530 mtwtf	Estonia, Radio		5925eu			
1530-1600	Australia, Radio		6060pa	7260as	9510as	9560pa
			9580pa	11800pa	11855as	13755as
1530-1600	Austria, R Austria Intl		11780as			
1530-1545	Finland, Radio		6120eu	11755eu	11820eu	15240me
			21550af			
1530-1600	Georgia, Georgian Radio		11920eu			
1530-1540 mtwhfa	Greece, Voice of		15630eu	15652na	17525na	
1530-1600 vl	Russia, Radio Centre		15185eu			
1530-1600 irreg	Tanzania, Radio		11765af			
1530-1600	United Kingdom,BBC London		6190af	6195eu	7180as	9410eu
	9515na	9740va	9760eu	11750as	11940af	12095eu
	15070va	15260na	15310as	15400eu	17705eu	17840am
	17860af	17880af	21470af	21660af		
1545-1600	Vatican State, Vatican R		15090au	17865as		

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.
1515 BBC: Concert Hall. Classical music from the world's great concert halls (except 3rd, Sportsworld Special, the Prix De L'Arc De Triomphe horse race).
1515 Radio Japan: Hello From Tokyo. See S 0315.
1534 Deutsche Welle: Pop From Germany. A look at the German pop music scene.
1535 Radio Austria Int'l: Report From Austria. See S 0135.
1545 BBC: Jazz Now And Then (3rd). See A 0145.
1555 Radio Japan: Viewpoint. See S 0355.

Mondays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: Feature. See M 0101.
1515 Radio Japan: Sports Spotlight. See M 0315.
1530 Radio Japan: People. See M 0330.
1534 Deutsche Welle: Monday Special. An interview or report on an event or development with special relevance for Africa.
1535 Radio Austria Int'l: Report From Austria. See S 0135.
1550 Radio Japan: Commentary. See M 0350.
1555 Radio Japan: Tokyo Pop-In. See M 0555.

Tuesdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener rock music requests.
1515 Radio Japan: A Glimpse Of Japan. See T 0315.
1530 Radio Japan: World Update. See T 0330.
1534 Deutsche Welle: Insight. An in-depth feature, giving the background to political events and international developments.
1535 Radio Austria Int'l: Report From Austria. See S 0135.
1550 Radio Japan: Commentary. See M 0350.
1555 Radio Japan: Tokyo Pop-In. See M 0555.

Wednesdays

1503 Radio Jordan: Science Report. See S 1130.
1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: Talks. See M 0415.
1515 Radio Japan: Asia Hotline. See W 0315.
1530 BBC: Comedy. Nicholas Parsons hosts the long-running quiz "Just A Minute" (except 27th: Two Cheers For October, a humorous look at the month just past).
1530 Radio Japan: Asia Plaza. See W 0330.
1530 Radio Jordan: Islam And The Arabs In The West.
1534 Deutsche Welle: Living In Germany. See M 0116.
1535 Radio Austria Int'l: Report From Austria. See S 0135.
1550 Radio Japan: Commentary. See M 0350.
1555 Radio Japan: Tokyo Pop-In. See M 0555.

Thursdays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: Ray On Record. See S 2315.
1515 Radio Japan: Japan Close-Up. See H 0315.
1530 Radio Japan: Crosscurrents. See H 0330.
1534 Deutsche Welle: Spotlight On Sport. Background stories and coverage of important sporting events.
1535 Radio Austria Int'l: Report From Austria. See S 0135.
1550 Radio Japan: Commentary. See M 0350.
1555 Radio Japan: Tokyo Pop-In. See M 0555.

Fridays

1509 Deutsche Welle: Newsline Cologne. See M 1109.
1515 BBC: Music Review. See H 2315.
1515 Radio Japan: Business Focus. See F 0315.
1530 Radio Japan: Techno-Business. See F 0330.
1534 Deutsche Welle: Economic Notebook. See T 0334.
1535 Radio Austria Int'l: Report From Austria. See S 0135.
1550 Radio Japan: Commentary. See M 0350.
1555 Radio Japan: Tokyo Pop-In. See M 0555.

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.
1515 BBC: Sportsworld. See A 1401.
1515 Radio Japan: This Week. See S 0115.
1534 Deutsche Welle: Science And Technology. See M 1634.
1535 Radio Austria Int'l: Report From Austria. See S 0135.

1600 UTC [12:00 PM EDT/9:00 AM PDT]

FREQUENCIES

1600-1630	Australia, Radio	5995pa	7240pa	7260as	9510as
		9580pa	11680as	11695pa	
1600-1700 vl	Australia, VL8A Alice Spg	2310do			
1600-1700 vl	Australia, VL8K Katherine	2485do			
1600-1700 vl	Australia, VL8T Tent Crk	2325do			
1600-1700	Bahrain, Radio	6010do			
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, China Radio Intl	4130af	11575af	15110af	15130af
1600-1700	Costa Rica,R forPeace Int	7375na	7385am	13630na	
1600-1700	Ecuador, HCJB Quito	21455am			
1600-1700	France, Radio France Intl	6175eu	11705af	12015af	15530me
		17620af	17795af	17850af	
1600-1650	Germany, Deutsche Welle	6170as	7225as	9875as	15105as
		15595as	17810as	21680as	
1600-1700	Ghana, GBC Radio 1	4915do			
1600-1700	Ghana, GBC Radio 2	7295do			
1600-1700	Guam, KSDA AWR Agat	11980as			
1600-1645	Guam, KTWR Agana	15610as			
1600-1630	Italy, AWR Europe	15125eu			
1600-1700 vl	Italy, IRRS Milano	7125va			
1600-1630	Jordan, Radio	9560eu			
1600-1700 s	Lebanon, King of Hope	6280me			
1600-1615 mha	Mongolia, R Ulaanbaatar	7560as	7780as		
1600-1630	Netherlands, Radio	9890as	13700as	15150as	17610as
1600-1700	Nigeria, Radio	4990do			
1600-1700	Nigeria, Voice of	7255af			
1600-1630 s	Norway, Radio Norway Intl	15230eu	17825me		
1600-1700	Pakistan, Radio	11570me	13590me	15515af	15555me
		15675me	17725af		
1600-1700 vl	PNG, Natl BC	4890do			
1600-1700	Russia, Radio Moscow Intl	9505am	9660eu	9755eu	9825eu
		9880eu	9895eu	11705am	11940am
		11995am	12050am	15125as	15180na
		15290na	15355as	15425na	15540af
		17580af	17700af	17735na	17760na
		17765af	17790na		
1600-1700	S Africa, Channel Africa	5960af	17710af		
1600-1700 vl	S Africa, Radio Oranje	4875do			
1600-1700	Saudi Arabia, BSKSA	9705eu	9720eu		
1600-1605	Singapore, SBC Radio One	5010do	5052do	11940do	
1600-1700	South Korea, Radio Korea	4945af	5975as	15220af	
1600-1700	Sri Lanka, SLBC Colombo	6075as	9720as		
1600-1700	Swaziland, Trans World R	9500af			
1600-1700 irreg	Tanzania, Radio	11765af			
1600-1645	UAE, UAE Radio Dubai	11795af	13675eu	15435eu	21605eu
1600-1700 vl	Uganda, Radio	4976do			
1600-1630	United Kingdom,BBC London	3915as	6190af	6195eu	9410eu
		9515na	9740va	11750as	12095eu
		15070va	15260na	15310as	15400eu
		17840af	17860af	17880af	21470af
		21660af			
1600-1700	USA, CSMonitor Boston MA	11580as	13625va	17510na	21640af
1600-1700 sa	USA, CSMonitor Boston MA	13710na	17555am		
1600-1700	USA, KCBI Dallas TX	15375va			
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, VOA Washington DC	6110as	7125as	9645as	9700as
		9760as	11920af	11995af	13710af
		15255as	15255af	15395as	15410af
		15445af	17785af	17785af	17895af
		19379af			
1600-1630	USA, VOA Washington DC	9700eu	15205eu	15255eu	19379eu
1600-1700	USA, WEWN Birmingham AL	17535na			
1600-1700	USA, WHRI Noblesville IN	9465na	13760na	15105na	
1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700	USA, WRNO New Orleans LA		15420na		
1600-1700	USA, WWCR Nashville TN	13845am	15685am		
1600-1700	USA, WYFR Okeechobee FL	11705na	11830af	15355eu	17750eu
		21525af	21615af		
1600-1630	Vatican State, Vatican R	6245eu	7250eu	15090as	17865as
1600-1630 a	Vatican State, Vatican R	15090af	17730af		
1600-1630	Vietnam, Voice of	9840af	12020af	15010af	
1600-1630	Yemen, Radio TV Corp	5970eu	7190eu		
1615-1645	Sweden, Radio	6065eu			
1630-1700	Australia, Radio	5995pa	6060pa	7240pa	7260pa
		9510pa	9580pa	11695pa	11880pa
		13755as			
1630-1657	Canada, RCI Montreal	7150as	9555as		
1630-1700	Ecuador, HCJB Quito	17790me	21480me		
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700	United Kingdom,BBC London	3915as	5975as	6190af	6195eu
		7160as	9410eu	9515na	9630af
		9740va	11720as	11750as	12095eu
		15070va	15260na	15310as	15400eu
		15420af	17860af	17880af	21470af
		21660af			
1630-1700	USA, VOA Washington DC	15255eu	17735eu	19379eu	
1645-1700 s	Guam, KTWR Agana	15610as			
1645-1700	Tajikistan, Radio	7245as			
1650-1700 mtwhf	New Zealand, R NZ Intl	9675pa			

SELECTED PROGRAMS

Sundays

1605 Radio Norway Int'l: Norway Now. See S 1205.
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 0615.
1634 Deutsche Welle: German By Radio. See S 0134.
1635 Radio Korea: Shortwave Feedback. See S 0635.
1645 BBC: Letter From America. See S 0615.

Mondays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: New Ideas. A look at the latest technology, innovations, and new products.
1615 Radio Korea: News Commentary. See S 0115.
1620 Radio Korea: Seoul Calling. See M 0620.
1634 Deutsche Welle: Science And Technology. New scientific and technological developments.
1635 BBC: Talks. Tracey Logan examines the elements in "A World Of Its Own" (4th, 11th, 18th); religious edifices are the fare in "Perfectly Proportioned" (25th-December 27th).
1640 Radio Korea: Tales From Korea's Past. See M 0640.
1645 BBC: The World Today. A look at a topical aspect of the international scene.

Tuesdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Megamix. See T 1130.
1615 Radio Korea: News Commentary. See S 0115.
1620 Radio Korea: Seoul Calling. See M 0620.
1634 Deutsche Welle: Man And Environment. A program on all topics relating to the environment in industrial and developing countries.
1640 Radio Korea: Korean Cultural Trails. See T 0640.
1645 BBC: The World Today. See M 1645.

Wednesdays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Rock/Pop Music. See T 0630.
1615 Radio Korea: News Commentary. See S 0115.
1620 Radio Korea: Seoul Calling. See M 0620.
1634 Deutsche Welle: Insight. See T 1534.
1640 Radio Korea: Pulse Of Korea. See W 0640.
1645 BBC: The World Today. See M 1645.

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 0115.
1620 Radio Korea: Seoul Calling. See M 0620.
1630 Radio Korea: Korean Literary Corner. See H 0630.
1634 Deutsche Welle: Living In Germany. See M 0116.
1640 Radio Korea: Forward To Reunification. See H 0640.
1645 BBC: The World Today. See M 1645.

Fridays

1609 Deutsche Welle: Newsline Cologne. See M 1109.
1615 BBC: Science In Action. Science and technology.
1615 Radio Korea: News Commentary. See S 0115.
1620 Radio Korea: Let's Sing Together. See F 0620.
1634 Deutsche Welle: Spotlight On Sport. See H 1534.
1640 Radio Korea: Let's Learn Korean. See F 0640.
1645 BBC: The World Today. See M 1645.

Saturdays

1609 Deutsche Welle: International Talking Point. See S 0419.
1615 BBC: Sportsworld. See A 1401.
1615 Radio Korea: News Commentary. See S 0115.
1620 Radio Korea: Sites And Sounds. See S 0120.
1623 Deutsche Welle: Development Forum. See A 1513.
1634 Deutsche Welle: Religion And Society. See S 1509.
1635 Radio Korea: From Us To You. See S 0135.

English language

shortwave guide

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1800	Australia, Radio	5995pa	6060pa	6080pa	7240pa
		9510pa	9580pa	11695pa	11880pa
		13755as			
1700-1800	Azerbaijan, Voice of	15240as			
1700-1800	Bahrain, Radio	6010do			
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, China Radio Intl	4130af	7405af	8260af	9570as
		11575as	15345as	15370as	
1700-1800	Costa Rica,R forPeace Int	7385am	15030na	21465am	
1700-1727	Czech Republic, R Prague	6055af	7345af	9490af	13600af
		15605af			
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	21480na
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800	Ghana, GBC Radio 1	4915do			
1700-1800 as	Guam, KSDA AWR Agat	13720as			
1700-1715	Israel, Kol Israel	7465na	11587eu	11675eu	15640eu
1700-1800 vl	Italy, IRRS Milano	7125eu			
1700-1800	Japan, NHK/Radio Japan	9750na	11815as	11865as	17750me
1700-1735	Kazakhstan, R Alma Ata	5035eu	5260eu	5960eu	15270eu
1700-1800 s	Lebanon, King of Hope	6280me			
1700-1800 a	Morocco, RTV Marocaine	17815af			
1700-1800 mtwhf	New Zealand, R NZ Intl	6035pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	13785af
1700-1730 s	Norway, Radio Norway Intl	9655eu	15220eu		
1700-1800	Pakistan, Radio	11570eu	15550eu		
1700-1755	Poland, Polish R Warsaw	7270eu	9525eu		
1700-1800	Russia, Radio Moscow Intl	9505am	9540am	9880am	11705af
		11940af	11960af	11995am	12050am
		12065af	15180af	15290na	15355af
		15385af	15395af	15425na	15580na
		17605am	17735na	17760am	17790am
1700-1800	S Africa, Channel Africa	4945af	11750af		
1700-1800 vl	S Africa, Radio Oranje	4875do			
1700-1800	Saudi Arabia, BSKSA	9705eu	9720eu		
1700-1730	Sri Lanka, SLBC Colombo	6075as	9720as		
1700-1730	Switzerland, Swiss R Intl	13635af	15430af	17635af	21770af
1700-1800 irreg	Tanzania, Radio	11765af			
1700-1800 vl	Uganda, Radio	4976do			
1700-1730	United Kingdom,BBC London	3915as	6180eu	6195eu	7325eu
		9410eu	9515na	9740na	12095eu
		15070am	15260af	15400af	15420af
		17880af	21660af		
1700-1800	USA, CSMonitor Boston MA	11580as	13625va	17510na	21640af
1700-1800 sa	USA, CSMonitor Boston MA	13710na	17555am		
1700-1800	USA, KCBI Dallas TX	15375va			
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1730	USA, VOA Washington DC	11920af	11995af	13710af	15410af
		15445af	17785af	17895af	19379eu
1700-1800	USA, WEWN Birmingham AL	13615na			
1700-1800	USA, WHRI Noblesville IN	13760am			
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRNO New Orleans LA		15420na		
1700-1800	USA, WWCR Nashville TN	13845am	15685am		
1700-1800	USA, WYFR Okeechobee FL	21500af			
1730-1800	Bulgaria, Radio	11720eu	13670na		
1730-1800	Netherlands, Radio	6020af	7120af	17655af	21590af
1730-1800	Romania, R Romania Intl	15340af	15365af	17745af	17805af
1730-1800 vl	Sierra Leone, SLBS	3316do			
1730-1800	Sweden, Radio	6065af	9645me	15270af	
1730-1800	United Kingdom,BBC London	6180eu	6195eu	7160me	7325eu
		9410eu	9515me	9740va	11720as
		12095eu	15070va	15260af	15400af
		15420af	17780af	17880af	21660af
1730-1800	Vatican State, Vatican R	11625af	15090af	17730af	
1745-1800 mtwhfa	Honduras R Copan Intl	15675am			
1745-1800	India, All India Radio	7412eu	9950me	11620eu	11860eu
11935af 15080af					

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1900	Australia, Radio	5995pa	6060pa	6080pa	7240pa
	7260pa 9580pa	11695pa	11855pa	11880pa	
1800-1900	Bahrain, Radio	6010do			
1800-1830	Belgium, R Vlaanderen	5910af	13685eu		
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Bulgaria, Radio	11720eu	13670na		
1800-1900	Bulgaria, Radio	11720eu	17670na		
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	Costa Rica,R forPeace Int	7375am	7385am	13630am	15030am
		21465am			
1800-1900	Ecuador, HCJB Quito	21455am			
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900	Ghana, GBC Radio 1	4915do			
1800-1900	Ghana, GBC Radio 2	7295do			
1800-1900 as	Guam, KSDA AWR Agat	13720as			
1800-1900 mtwhfa	Honduras, R Copan Intl	15675am			
1800-1900	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		
1800-1900 vl	Italy, IRRS Milano	7125eu			
1800-1900	Kuwait, Radio	13620na			
1800-1900	Lebanon, King of Hope	6280me			
1800-1900	Netherlands, Radio	6020af	7120af	17655af	21590af
1800-1850 smtwhf	New Zealand, R NZ Intl	11735pa			
1800-1830 mtwhf	Portugal, Radio	9780eu			
1800-1900	Russia, Radio Moscow Intl	9880eu	11630af	11770as	11995na
	12015af 12050af	15150af	15185af	15290na	15355me
	15385af 15405as	15425as	15580na	17605na	17760af
	17790na 17875as	21670me			
1800-1900 vl	S Africa, Radio Oranje	4875do			
1800-1900	Saudi Arabia, BSKSA	9705eu	9720eu		
1800-1900 vl	Sierra Leone, SLBS	3316do			
1800-1900	Sudan, Radio Omdurman	7200do	9165do		
1800-1900	Swaziland, Trans World R	3200af	9500af		
1800-1900 irreg	Tanzania, Radio	11765af			
1800-1900 vl	Uganda, Radio	4976do			
1800-1830	United Kingdom,BBC London	3255af	6180eu	6195eu	7160va
	7325eu 9410eu	9740va	11720as	11955au	12095eu
	15070va 15400af	15420af	17880af		
1800-1900	USA, CSMonitor Boston MA	9455pa	15665eu	17510na	17612af
1800-1900 sa	USA, CSMonitor Boston MA	17555am			
1800-1900	USA, KCBI Dallas TX	15375am			
1800-1900 irreg	USA, KJES Mesquite NM	9510na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, VOA Washington DC	3980me	6040eu	9700eu	9760eu
	11920af 11995af	13710af	15205eu	15410af	15580af
	17800af 17895af	19379eu			
1800-1900	USA, WEWN Birmingham AL	13615na	15695na		
1800-1900	USA, WHRI Noblesville IN	9590na	13760na		
1800-1900	USA, WINB Red Lion PA	15295eu			
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA		15420na		
1800-1900	USA, WWCR Nashville TN	13845am	15685am		
1800-1900	USA, WYFR Okeechobee FL	21500af			
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1815-1900	Bangladesh, Radio	9570me	12030eu		
1830-1900	Austria, R Austria Intl	5945eu	6155eu	9880me	13730me
1830-1855	Finland, Radio	6120eu	9730eu	11755eu	15540eu
1830-1900	Serbia, Radio Yugoslavia	6100eu	7200eu	9505eu	17710af
1830-1900	Slovakia, R Slovakia Intl	5915eu	7345eu	9605eu	
1830-1900	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1830-1900	Switzerland, Swiss R Intl	6065eu	9655af	15270af	15505af
1830-1900	United Kingdom,BBC London	3255af	6180eu	6195eu	7325eu
	9410eu 9740am	11955au	12095eu	15070au	15400af
	15420af 17880af				
1835-1900	Kazakhstan, R Alma Ata	17605eu	17910eu		
1840-1850 mtwhfa	Greece, Voice of	15650af	17525af		
1845-1900 irreg s	Mali, Radio Malienne	4783do	4835do	5995do	
1850-1900 smtwhf	New Zealand, R NZ Intl	11735pa			

1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-2000	Algeria, Radio Algiers	9535eu	15205eu	17745eu	
1900-2000	Argentina, RAE	15345eu			
1900-2000	Australia, Radio	5995pa	6000pa	6060pa	6080pa
	7240pa 7260pa	9580pa	11695pa	11720pa	11855as
	11880pa 11910pa				
1900-2000	Bahrain, Radio	6010do			
1900-1930	Bulgaria, Radio	11720af			
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			

1900 UTC cont'd

1900-2000	Canada, CHNX Halifax	6130do				
1900-2000	Canada, CKZU Vancouver	6160do				
1900-2000	China, China Radio Intl	6955af	9440af	11515me		
1900-2000	Costa Rica,R forPeace Int	7385am	15030na	21465am		
1900-2000	Ecuador, HCJB Quito	17490va	17790eu	21455eu	21480eu	
1900-1950	Germany, Deutsche Welle	9640af	11740af	11785af	11810af	
		13790af	15350af	15390af	17765af	
1900-1945	India, All India Radio	7412eu	9950me	11620eu	11860eu	
		11935af	15080af			
1900-1930	Israel, Kol Israel	7465eu	9435eu	11585na	11603na	
		11675eu	15640na	15650af	17575na	
1900-2000 vl	Italy, IRRS Milano	7125va				
1900-2000	Japan, NHK/Radio Japan	9640am	9750as	11815pa	11865pa	
		11875pa				
1900-2000	Kuwait, Radio	13620na				
1900-2000	Lebanon, King of Hope	6280me				
1900-1930	Lithuania, Radio Vilnius	9710eu				
1900-2000 s	Morocco, RTV Marocaine	11920as				
1900-1930	Netherlands, Radio	6020af	7120af	17655af	21590af	
1900-2000 smtwhf	New Zealand, R NZ Intl	11735pa				
1900-2000	Nigeria, Radio	3326do	4990do			
1900-2000	Nigeria, Voice of	7255af				
1900-1930 s	Norway, Radio Norway Intl	15355pa	15365am			
1900-1930 mtwhf	Portugal, Radio	15515af				
1900-2000	Romania, R Romania Intl	9750eu	11810eu	11940eu	15365eu	
1900-2000	Russia, AWR Russia	9835eu				
1900-2000	Russia, Radio Moscow Intl	9610af	9860eu	9880af	11630eu	
	11760na 11770af	11840af	12015eu	12050eu	15150af	
	15180af 15290eu	15355eu	15385af	15405af	15425na	
	15480af 15535af	15580af	17560af	17605af	17690na	
	17760na					
1900-2000	Saipan, KFBS Marpi	9465as				
1900-2000	Saudi Arabia, BSKSA	9705eu	9720eu			
1900-2000 vl	Sierra Leone, SLBS	3316do				
1900-2000	Spain, Spanish Natl Radio	15375af				
1900-2000	Sri Lanka, SLBC Colombo	9720eu	15120eu			
1900-2000	Swaziland, Trans World R	3200af	3240af			
1900-1915 irreg	Tanzania, Radio	11765af				
1900-2000 vl	Uganda, Radio	4976do				
1900-1930	United Kingdom,BBC London	3255af	6005af	6180eu	6190af	
	6195eu 7160me	9410eu	9630af	9740as	11955au	
	12095eu 15070va	15400af	17880af			
1900-2000	USA, CSMonitor Boston MA	9445pa	15665eu	17510na	17612af	
1900-2000 sa	USA, CSMonitor Boston MA	17555am				
1900-2000	USA, KCBI Dallas TX	15375va				
1900-2000	USA, KTBN Salt Lk City UT	15590am				
1900-2000	USA, VOA Washington DC	3980me	6040me	9525as	9700eu	
	9760eu 11870as	11920af	11995af	13710af	15180as	
	15205eu 15410af	15495af	15580af	17800af	17895af	
	19379eu					
1900-2000	USA, WEWN Birmingham AL	13615na	15695na			
1900-2000	USA, WHRI Noblesville IN	13760na				
1900-2000	USA, WINB Red Lion PA	15295eu				
1900-2000	USA, WJCR Upton KY	7490na	13595na			
1900-2000	USA, WMLK Bethel PA	9465eu				
1900-2000	USA, WRNO New Orleans LA		15420na			
1900-2000	USA, WWCR Nashville TN	13845am	15685am			
1900-2000	USA, WYFR Okeechobee FL	15355eu	21615af			
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu		
1910-1920	Botswana, Radio	3356af	4830af	7255af		
1930-2000	Iran, VOIRI Tehran	9022eu	15260eu			
1930-2000	Netherlands, Radio	17605af	21590af			
1930-2000	Poland, Polish R Warsaw	6135eu	7270eu	7285eu	9525eu	
1930-2000	United Kingdom,BBC London	3255af	6005af	6180eu	6190af	
	6195eu 7160me	9410eu	9630af	9740as	11955au	
	12095eu 15070am	15400af	17880af			
1935-1955	Italy, RAI Rome	7275eu	9710eu	11800eu		
1940-2000 mha	Mongolia, R Ulaanbaatar	11790eu	11850eu			
1950-2000	Vatican State, Vatican R	5885eu	7250eu			

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2100	Australia, Radio	5995pa	6000pa	6060pa	6080pa	
	7240pa 7260pa	9580pa	11695pa	11720as	11855pa	
	11880pa 11910pa					
2000-2100	Bahrain, Radio	6010do				
2000-2100	Bulgaria, Radio	11720eu	15330na			
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, China Radio Intl	4130eu	8260eu	9440af	9920eu	
		11500eu	11715af	15110af		
2000-2100	Costa Rica,R forPeace Int	7385am	15030am	21465am		
2000-2027	Czech Republic, R Prague	5055eu	7300eu	7345eu	9490eu	
2000-2100	Ecuador, HCJB Quito	21455am				
2000-2100	Ghana, GBC Radio 1	4915do				
2000-2100	Ghana, GBC Radio 2	7295do				
2000-2015 mtwhfa	Greece, Voice of	7450eu	9375eu			
2000-2100	Indonesia, Voice of	9675me	11752eu			
2000-2030	Iran, VOIRI Tehran	9022eu	15260eu			
2000-2100 vl	Italy, IRRS Milano	7125va				
2000-2010 mtwhf	Kenya, Kenya BC Corp	4935do				
2000-2100	Kuwait, Radio	13620na				
2000-2100	Lebanon, King of Hope	6280me				
2000-2010 smwha	Mongolia, R Ulaanbaatar	11790eu	11850eu			
2000-2025	Netherlands, Radio	17605af	21590af			
2000-2100	New Zealand, R NZ Intl	11735pa				
2000-2100	Nigeria, Radio	3326do	4990do			
2000-2100	Nigeria, Voice of	7255af				
2000-2100	North Korea, R Pyongyang	6576eu	9345eu	9640af	9977af	
2000-2100	Russia, Radio Moscow Intl	9785eu	9870eu	9890eu	11630af	
	11675af 11730na	11750na	11760na	11770af	11995na	
	12050na 13605af	15150af	15180af	15290na	15355as	
	15405af 15425na	15580na	17560af	17605na	17690na	
	17720na 17760na					
2000-2100 vl	S Africa, Radio Oranje	4875do				
2000-2100	Saudi Arabia, BSKSA	9705eu	9720eu			
2000-2100 vl	Sierra Leone, SLBS	3316do				
2000-2100 vl	Solomon Islands, SIBC	5020do	9545do			
2000-2045	Swaziland, Trans World R	3200af	3240af			
2000-2030	Switzerland, Swiss R Intl	9885af	12035af	13635af	15505af	
2000-2100	Turkey, Voice of	9445eu				
2000-2100 vl	Uganda, Radio	4976do				
2000-2030	United Kingdom,BBC London	5975na	6180eu	6195eu	7160as	
	7325eu 9410eu	9740as	11955au	12095eu	15070va	
	15260sa 15340au	15400au	17880af	21660af		
2000-2100	USA, CSMonitor Boston MA	9430as	9455as	15665eu	17510na	
		17555sa				
2000-2100	USA, KCBI Dallas TX	15375va				
2000-2100	USA, KTBN Salt Lk City UT	15590am				
2000-2030	USA, VOA Washington DC	11720af	13710af	15160af	15410af	
	15495af 15580af	17800af	17895af	21485af		
2000-2100	USA, VOA Washington DC	6040me	9700eu	9760eu	15205eu	
		13379eu				
2000-2100	USA, WEWN Birmingham AL	13615na				
2000-2100	USA, WHRI Noblesville IN	13760af	17830af			
2000-2100	USA, WJCR Upton KY	7490na	13595na			
2000-2100	USA, WMLK Bethel PA	9465eu				
2000-2100	USA, WRNO New Orleans LA		15420na			
2000-2100	USA, WWCR Nashville TN	13845va	15685va			
2000-2100	USA, WYFR Okeechobee FL	15355eu	15566eu	17612af	21525eu	
		21615eu				
2000-2030	Vatican State, Vatican R	9645af	11625af	15090af		
2005-2100	Syria, Radio Damascus	12085na	15095na			
2010-2100 sa	Kenya, Kenya BC Corp	4935do				
2025-2045	Italy, RAI Rome	7235me	9575me	11800me		
2030-2100	Canada, RCI Montreal	5995eu	7235eu	13650eu	13670af	
		15325eu	17820af	17850af	17875af	
2030-2035	Croatia, Croatian Radio	6145eu	9830eu	13830eu		
2030-2100	Egypt, Radio Cairo	15375af				
2030-2100 mh	Estonia, Radio	5925eu				
2030-2035	Latvia, Radio Riga	5935do				
2030-2100 mtwhfa	Palau, KHBN Voice of Hope	11980as				
2030-2057	Slovakia, R Slovakia Intl	7345eu				
2030-2100	South Korea, Radio Korea	5975eu	6035af	9640me	9870eu	
2030-2100	Sweden, Radio	6065af	9695eu			
2030-2100	United Kingdom,BBC London	5975na	6005af	6180eu	6195eu	
	7325eu 9410eu	9630af	11955au	12095eu	15070af	
	15260au 15340au	15400af				
2030-2100	USA, VOA Washington DC	13710af	15410af	15495af	15580af	
		17800af	17895af	21485af		
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu		
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu	
		11715pa	15265pa			

2100 UTC [5:00 PM EDT/2:00 PM PDT]

2100-2130	Australia, Radio	9645pa	11720pa	11855pa	11880pa
2100-2106	Bahrain, Radio	6010do			
2100-2130	Belguim, R Vlaanderen	5910eu	9905eu		
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			

2100 UTC cont'd

2100-2200	Canada, CHNX Halifax	6130do				
2100-2200	Canada, CKZU Vancouver	6160do				
2100-2129	Canada, RCI Montreal	5995eu	7235eu	13650eu	13670af	
		15325eu	17820af	17850af	17875af	
2100-2200	China, China Radio Intl	4130eu	8260eu	9920eu	9940af	
		11500af	11715af	15110af		
2100-2200	Costa Rica,R forPeace Int	7385am	15030na	21465na		
2100-2200	Cuba, Radio Havana Cuba	17760eu				
2100-2130	Czech Republic, R Prague	6055eu	7300eu	7345eu	9490eu	
2100-2130	Ecuador, HCJB Quito	21455va				
2100-2200	Egypt, Radio Cairo	15375af				
2100-2150	Germany, Deutsche Welle	9640af	9670as	9765as	11785as	
	13690as 15135af	15350af	15360as			
2100-2200	Ghana, GBC Radio 1	4915do				
2100-2200	Ghana, GBC Radio 2	7295do				
2100-2200 mtwhfa	Honduras, R Copan Intl	15675am				
2100-2200	Hungary, Radio Budapest	6110eu	9835eu	11910eu		
2100-2200	India, All India Radio	7412eu	9910au	9950eu	11620eu	
		11715pa	15265pa			
2100-2200 vl	Iraq, Radio Iraq Intl	11810na				
2100-2130 vl	Italy, IRRS Milano	7125va				
2100-2200	Japan, NHK/Radio Japan	6035eu	9640eu	9750eu	11815au	
		11925eu	15430af			
2100-2200	Lebanon, King of Hope	6280me				
2100-2200 mtwtf	Lebanon, Wings of Hope	11530me				
2100-2136 smtwhf	New Zealand, R NZ Intl	11735pa				
2100-2200	Nigeria, Radio	3326do	4990do			
2100-2130 s	Norway, Radio Norway Intl	15165na				
2100-2200 mtwhfa	Palau, KHBN Voice of Hope	11980as				
2100-2130 mtwhf	Portugal, Radio	15250af				
2100-2200	Romania, R Romania Intl	7195eu	7225eu	9750eu	11940eu	
2100-2200	Russia, Radio Galaxy	11880eu				
2100-2200	Russia, Radio Moscow Intl	9480af	9530na	9610me	9725eu	
	9880eu 11730na	11750na	11760af	11905af	12050na	
	13605af 15150as	15180af	15290na	15350af	15355as	
	15405af 15480as	15580na	17605af	17690af	17720as	
2100-2200 vl	S Africa, Radio Oranje	4875do				
2100-2130	Serbia, Radio Yugoslavia	6100eu	9505eu			
2100-2200 vl	Sierra Leone, SLBS	3316do				
2100-2200 vl	Solomon Islands, SIBC	5020do	9545do			
2100-2130	South Korea, Radio Korea	6480af	7550me	15575eu		
2100-2200	Spain, Spanish Natl Radio	6125eu				
2100-2200	Sri Lanka, SLBC Colombo	15120as				
2100-2105	Syria, Radio Damascus	12085na	15095na			
2100-2200	Ukraine, R Ukraine Intl	4825eu	6070eu	6090eu	7150eu	
	7195eu 7240eu	7285eu	9600eu	9640eu	9685eu	
	15135eu 15195eu	15570eu	17725eu			
2100-2130	United Kingdom,BBC London	3225af	5975ca	6005af	6180eu	
	6195eu 7180pa	7325eu	9410eu	9590na	11955pa	
	12095eu 15070af	15260sa	15340au	15370as	15400af	
2100-2200	USA, CSMonitor Boston MA	9430as	9455as	15665eu	17510na	
		17555sa				
2100-2200	USA, KCBI Dallas TX	15725am				
2100-2200	USA, KTBN Salt Lk City UT	15590na				
2100-2200	USA, VOA Washington DC	6040me	9700eu	9760eu	11870as	
	11960eu 13710af	15185as	15205eu	15410af	15495af	
	15580af 17735as	17800af	17895af	19379eu	21485af	
2100-2200	USA, WEWN Birmingham AL	13615na				
2100-2200	USA, WINB Red Lion PA	15185eu				
2100-2200	USA, WJCR Upton KY	7490na	13595va			
2100-2200	USA, WMLK Bethel PA	9465eu				
2100-2200	USA, WRNO New Orleans LA		15420na			
2100-2200	USA, WWCR Nashville TN	13845am				
2100-2200	USA, WYFR Okeechobee FL	15565eu	17612eu	17750af	21525eu	
		21615eu				
2100-2110	Vatican State, Vatican R	5885eu	7250eu			
2103-2110	Croatia, Croatian Radio	9830eu	13830eu			
2110-2200	Syria, Radio Damascus	12085na	15095na			
2115-2200	Egypt, Radio Cairo	9900eu				
2115-2130 mtwhf	United Kingdom,BBC Carib	15390ca	17715ca			
2130-2200	Albania, R Tirana Intl	9760eu	11840eu			
2130-2200	Australia, Radio	9645pa	11720pa	11855as	11880pa	
	15240pa 15320pa	15365pa	17795pa	21740pa		
2130-2200 vl	Australia, VL8T Tent Crk	4910do				
2130-2200	Austria, R Austria Intl	5945eu	6155eu	9880eu	13730af	
2130-2200	Ecuador, HCJB Quito	17490va	17790eu	21455va	21480eu	
2130-2200	Finland, Radio	6120eu	11755eu	15440eu		
2130-2200	Israel, Kol Israel	7465na	9435na	11587na	11603na	
		11675eu	15640eu	15650na	17575sa	
2130-2200	Lithuania, Radio Vilnius	9675eu	9710eu			
2130-2200	Sweden, Radio 6065eu					
2130-2200	United Kingdom,BBC Flk Is	13660sa				
2130-2200	United Kingdom,BBC London	3225af	5975ca	6005af	6180eu	
	6195eu 7180pa	7325eu	9410eu	9590na	11955pa	
	12095eu 15070af	15260sa	15340au	15370as	15400af	
2139-2200	New Zealand, R NZ Intl	15120pa				
2140-2200 s	Eqt Guinea, Radio Africa	7190af				
2145-2158	Armenia, Radio Yerevan	9450na	11920na	11945na	11960na	
		15385na				
2145-2200	Bulgaria, Radio	11720eu	15330na			
2145-2200	South Korea, Radio Korea	6480eu	15575eu			

2200 UTC [6:00 PM EDT/3:00 PM PDT]

200-2230	Albania, R Tirana Intl	9760eu	11825eu			
2200-2230	Australia, Radio	9540as	9645pa	11720pa	11855as	
	11880pa 15240pa	15320pa	15365pa	17795pa	21740pa	
2200-2300	Bulgaria, Radio	11720eu	15330na			
2200-2300	Canada, CBC Northern Svc	9625do				
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				
2200-2230	Canada, RCI Montreal	5960na	5995eu	7195eu	9755na	
	11705as 11730ca	11875na	13670ca	15305ca		
2200-2300	China, China Radio Intl	9880eu				
2200-2220 s	Congo, R Natl Congolaise	4765do	5985do			
2200-2300	Costa Rica,R forPeace Int	7385ca	15030ca	21465ca		
2200-2300	Cuba, Radio Havana Cuba	6180va				
2200-2230	Czech Republic, R Prague	5960eu	6055eu	7345eu	9605eu	
2200-2245	Egypt, Radio Cairo	9900eu				
2200-2258 s	Eqt Guinea, Radio Africa	7190af				
2200-2245	Finland, Radio	9730eu	11740eu	11810eu		
2200-2300	Ghana, GBC Radio 1	4915do				
2200-2300	Ghana, GBC Radio 2	7295do				
2200-2230 mtwhfa	Honduras, R Copan Intl	15675am				
2200-2230	India, All India Radio	7412eu	9910au	9950eu	11620eu	
		11715pa	15265eu			
2200-2300 vl	Iraq, Radio Iraq Intl	11810am	15180am	17940am		
2200-2225	Italy, RAI Rome	9710as	11800as	15330as		
2200-2300	Lebanon, King of Hope	6280me				
2200-2300 mtwtf	Lebanon, Wings of Hope	11530me				
2200-2230 mtwhf	Lithuania, Radio Vilnius	12040na				
2200-2300 vl	Malaysia, RTM Kota Kinaba	5980do				
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do				
2200-2300 vl	Malaysia, RTM Sarawak	4950do				
2200-2300	New Zealand, R NZ Intl	15120pa				
2200-2300	Nigeria, Radio	3326do	4990do			
2200-2300 mtwhfa	Palau, KHBN Voice of Hope	11980as				
2200-2300	Russia, Radio Moscow Intl	9480af	9530na	9685eu	9715eu	
	9725eu 9815eu	9820eu	11705na	11750na	11805af	
	11905af 12050na	15140af	15290na	15410na	17560af	
	17570af 17675af	17720na	21690af			
2200-2300 vl	S Africa, Radio Oranje	4875do				
2200-2300 vl	Sierra Leone, SLBS	3316do				
2200-2300	Singapore, SBC Radio One	5010do	5052do	11940do		
2200-2300 vl	Solomon Islands, SIBC	5020do	9545do			
2200-2230	South Korea, Radio Korea	7275as	9640as			
2200-2245	South Korea, Radio Korea	6480eu	15575eu			
2200-2230	Switzerland, Swiss R Intl	9810am	9885am	12035am	15570am	
2200-2210	Syria, Radio Damascus	12085na	15095na			
2200-2300	Taiwan, VO Free China	17750eu	21720eu			
2200-2300	Turkey, Voice of	7185me	9445na	11895eu		
2200-2300	UAE, Radio Abu Dhabi	11885na	15305na	15315na		
2200-2300	Ukraine, R Ukraine Intl	4795eu	6020eu	7195eu	7240eu	
		9710eu	9860eu			
2200-2300	United Kingdom,BBC London	5970eu	5975na	6195eu	7325eu	
	9410eu 9570pa	9590na	9750as	9915sa	11750sa	
	11955pa 12095eu	15070va	15260sa	15340au	15400af	
2200-2300	USA, CSMonitor Boston MA	9465na	13625as	15665eu	17555sa	
2200-2300	USA, KCBI Dallas TX	15725va				
2200-2300	USA, KTBN Salt Lk City UT	15590am				
2200-2300	USA, VOA Washington DC	7120as	7140as	7215as	9770as	
	11760as 15185as	15290as	15305as	17735as	17820as	
2200-2300	USA, WEWN Birmingham AL	7425am	11820am			
2200-2300	USA, WHRI Noblesville IN	13760eu				
2200-2245	USA, WINB Red Lion PA	15185eu				
2200-2300	USA, WJCR Upton KY	7490na	13595na			
2200-2300	USA, WRNO New Orleans LA		15420na			
2200-2300	USA, WWCR Nashville TN	13845am				
2200-2300	USA, WYFR Okeechobee FL	17612na	21525eu			
2200-2230 s	USA,KGEI San Francisco CA	15280sa				
2203-2209	Croatia, Croatian Radio	6145eu	9830eu	13830eu		
2230-2300	Australia, Radio	9645pa	11720pa	11855pa	11880pa	
	15240pa 15320pa	15365pa	17795pa	21740pa		
2230-2300	Canada, RCI Montreal	5960am	5995eu	7195eu	9755am	
		13670am				
2230-2300	Sweden, Radio	6065as	11910eu			
2240-2250 smtwhf	Greece, Voice of	11645au				
2245-2257	Armenia, Radio Yerevan	9450na	11920na	11945na	11960na	
		15385na				
2245-2300	India, All India Radio	9910as	11745as	11785as	15110as	
		15145as				
2245-2300	USA, WINB Red Lion PA	15145eu				
2245-2300	Vatican State, Vatican R	9600as	11830as	15090pa		

2300 UTC [7:00 PM EDT/4:00 PM PDT]

FREQUENCIES

2300-2400	Australia, Radio	11720pa	11855as	11880pa	15240pa
		15320pa	15365pa	17795pa	21740pa
2300-2400 vl	Australia, VL8A Alice Spg	4835do			
2300-2400 vl	Australia, VL8K Katherine	5025do			
2300-2400 vl	Australia, VL8T Tent Crk	4910do			
2300-2315	Bulgaria, Radio	11720eu	15330na		
2300-2400	Canada, CFCX Montreal	6005do			
2300-2400	Canada, CFRX Toronto	6070do			
2300-2400	Canada, CFVP Calgary	6030do			
2300-2400	Canada, CHNX Halifax	6130do			
2300-2400	Canada, CKZU Vancouver	6160do			
2300-2400 mtwhf	Canada, RCI Montreal	5960eu	5995eu	7195eu	9755na
		13670na			
2300-2400 as	Canada, RCI Montreal	5995eu	7195eu	9755na	11940na
		13670na	15235na		
2300-2400	Costa Rica, AWR Alajuela	9725ca	11870ca		
2300-2400	Costa Rica,R forPeace Int	7385na	13630na	15030na	21465na
2300-2400	Ecuador, HCJB Quito	9745am	21455am		
2300-2315 a	Eqt Guinea, Radio Africa	7203af			
2300-2305	Ghana, GBC Radio 1	4915do			
2300-2305	Ghana, GBC Radio 2	7295do			
2300-2400	Guam, KSDA AWR Agat	15610as			
2300-2400	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
2300-2400 vl	Iraq, Radio Iraq Intl	15180am			
2300-2400	Japan, NHK/Radio Japan	6060eu	6125eu	7140eu	15430as
		17810as			
2300-2400	Lebanon, King of Hope	6280me			
2300-2400 mtwhf	Lebanon, Wings of Hope	11530me			
2300-2330	Lithuania, Radio Vilnius	11750na	12040na		
2300-2400 vl	Malaysia, RTM Kota Kinaba	5980do			
2300-2400 smtwha	Malaysia, RTM Radio 4	7295do			
2300-2400 vl	Malaysia, RTM Sarawak	4950do	7160do		
2300-2400	New Zealand, R NZ Intl	15120pa			
2300-2350	North Korea, R Pyongyang	11700am	13650am		
2300-2330 s	Norway, Radio Norway Intl	9655am	11795am		
2300-2400 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2300-2400 vl	PNG, Natl BC	4890do			
2300-2400	Russia, Radio Moscow Intl	9480na	9815eu	9860na	11720na
		11790na	11805na	11840na	11975na
		12050na	15140na	15410na	15425na
		15535as	17560as	17570as	17675as
		21625as	21670as	21690as	
2300-2400 vl	S Africa, Radio Oranje	4875do			
2300-2310 vl	Sierra Leone, SLBS	3316do			
2300-2400	Singapore, SBC Radio One	5010do	5052do	11940do	
2300-2400 vl	Solomon Islands, SIBC	5020do	9545do		
2300-2330	Sweden, Radio	6065pa	11910pa		
2300-2400	Thailand, Radio	4830eu	9655as	11905as	
2300-2400	UAE, Radio Abu Dhabi	11855na	15305na	15315na	
2300-2330	United Kingdom,BBC London	5970eu	5975na	6175na	6195as
		7180as	7325eu	9410eu	9570as
		9590na	9915sa	11750sa	11945as
		11955va	12095na	15070am	15260sa
		15280as	15400as		
2300-2400	USA, CSMonitor Boston MA	9465na	13625as	15665eu	17555am
2300-2400	USA, KCBI Dallas TX	15725va			
2300-2400	USA, KTBN Salt Lk City UT	15590na			
2300-2400	USA, VOA Washington DC	7120as	7140as	7215as	9770as
		11760as	15185as	15290as	15305as
		17735as	17820as		
2300-2400	USA, WEWN Birmingham AL	7425am			
2300-2400	USA, WHRI Noblesville IN	13760am			
2300-2400	USA, WINB Red Lion PA	15145eu			
2300-2400	USA, WJCR Upton KY	7490na	13595na		
2300-2400	USA, WWCR Nashville TN	13845am			
2300-2315	Vatican State, Vatican R	9600as	11830as	15090pa	
2315-2330	United Kingdom,BBC London	6110sa	9560sa	9825sa	11765sa
		15390sa			
2330-2400	Belgium, R Vlaanderen	9930am	13655am		
2330-2400 a	Colombia, Radio Nacional	11822.	5 17865am		
2330-2400	Netherlands, Radio	6020na	6165na		
2330-2400 m	Sri Lanka, SLBC Colombo	15425am			
2330-2400	Sweden, Radio	6065as	11910eu		
2330-2400	United Kingdom,BBC London	5975na	6175na	6195as	7325eu
		9570as	9590na	9915sa	11750sa
		11945as	11955am	12095na	15070am
		15260sa	15280as	15340am	
2330-2400	Vietnam, Voice of	9840as	12020as	15010as	
2335-2345 smtwhf	Greece, Voice of	9425sa	11595sa	11645sa	

SELECTED PROGRAMS

Sundays

2305 BBC: World Business Review. The previous week's news and upcoming events.
2305 Radio Norway Int'l: Norway Now. See S 1205.
2315 BBC: Ray On Record. Robin Ray presents selections of classical music.
2315 Radio Japan: Hello From Tokyo. See S 0315.
2355 Radio Japan: Viewpoint. See S 0355.

Mondays

2305 BBC: World Business Report. The latest news from the markets worldwide.
2315 BBC: On Screen. Reports on movies and the movie business.
2315 Radio Japan: Sports Spotlight. See M 0315.
2330 BBC: Multitrack 1. Tim Smith presents the smash singles on the UK pop charts.
2330 Radio Japan: People. See M 0330.
2350 Radio Japan: Commentary. See M 0350.

Tuesdays

2305 BBC: World Business Report. See M 2305.
2315 BBC: Concert Hall. See S 1515.
2315 Radio Japan: A Glimpse Of Japan. See T 0315.
2330 Radio Japan: World Update. See T 0330.
2350 Radio Japan: Commentary. See M 0350.

Wednesdays

2305 BBC: World Business Report. See M 2305.
2315 BBC: From Our Own Correspondent. See S 0330.
2315 Radio Japan: Asia Hotline. See W 0315.
2330 BBC: Multitrack 2. Graham Bannerman presents new pop records, interviews, news, and competitions.
2330 Radio Japan: Asia Plaza. See W 0330.
2350 Radio Japan: Commentary. See M 0350.

Thursdays

2305 BBC: World Business Report. See M 2305.
2315 BBC: Music Review. News and features from the world of classical music.
2315 Radio Japan: Japan Close-Up. See H 0315.
2330 Radio Japan: Crosscurrents. See H 0330.
2350 Radio Japan: Commentary. See M 0350.

Fridays

2305 BBC: World Business Report. See M 2305.
2315 BBC: Worldbrief. A roundup of the week's news headlines and developments.
2315 Radio Japan: Business Focus. See F 0315.
2330 BBC: Multitrack 3. Sarah Ward presents the latest from the alternative pop scene.
2330 Radio Japan: Techno-Business. See F 0330.
2350 Radio Japan: Commentary. See M 0350.

Saturdays

2305 BBC: Words Of Faith. See M 1209.
2310 BBC: Book Choice. See W 0425.
2315 BBC: A Jolly Good Show. See T 1515.
2315 Radio Japan: This Week. See S 0115.

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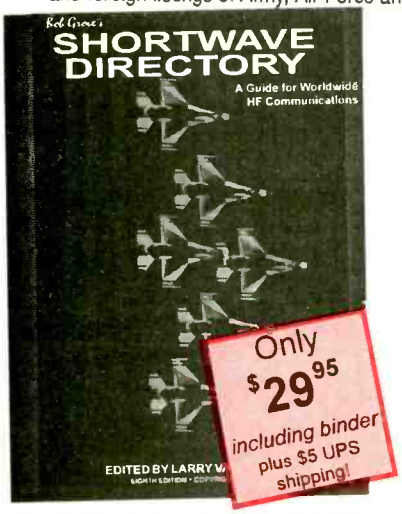

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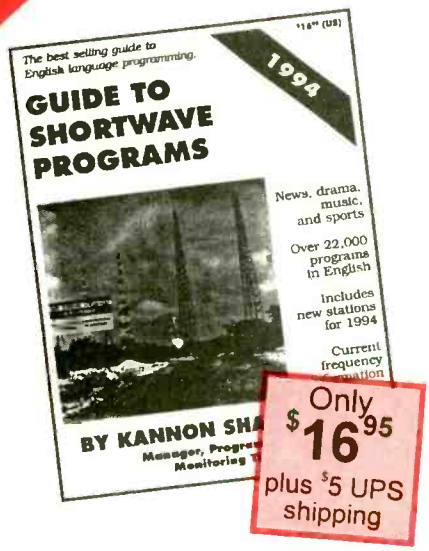
by Kannon Shanmugam



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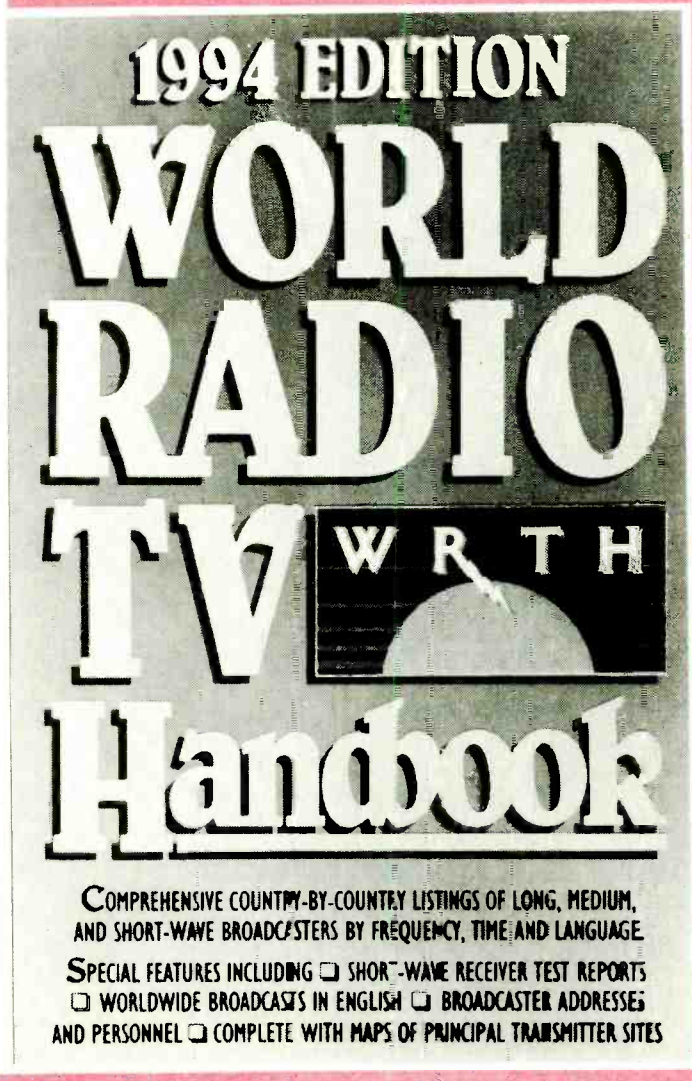

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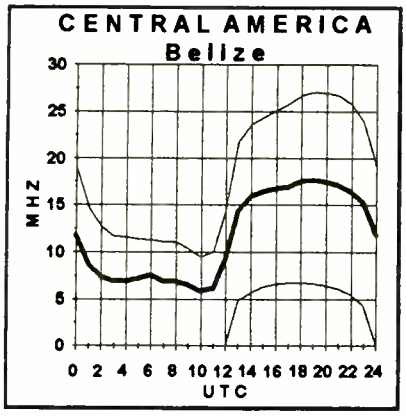
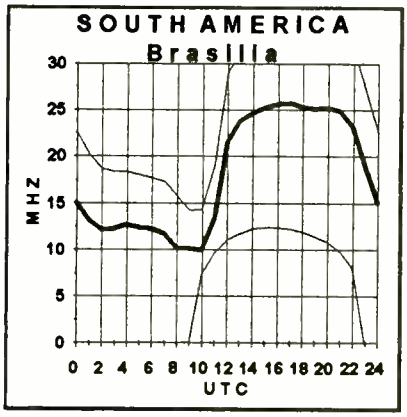
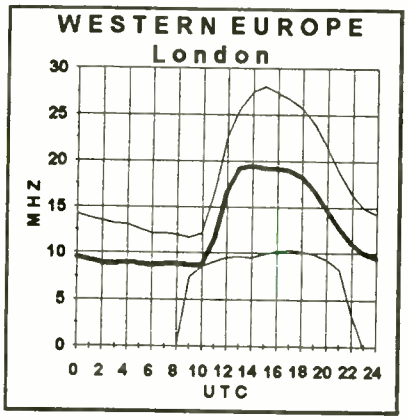
Propagation conditions: Eastern United States

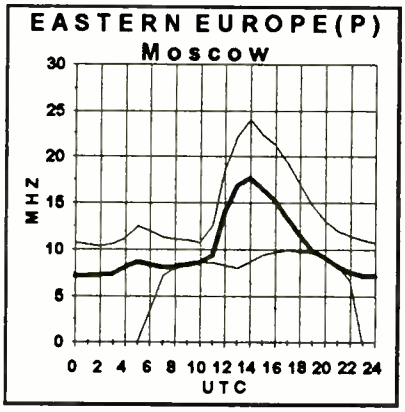
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.

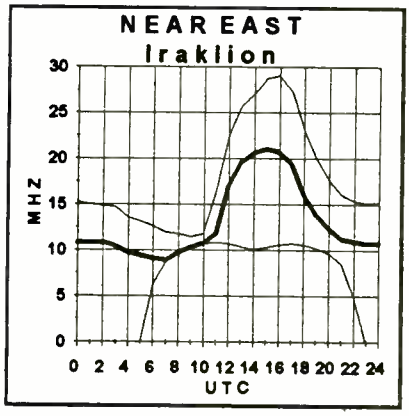
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows

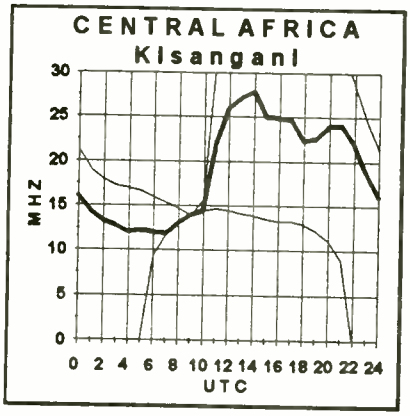


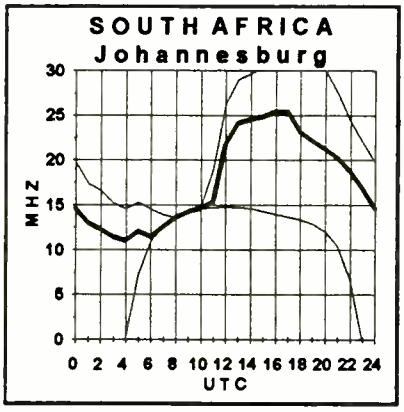


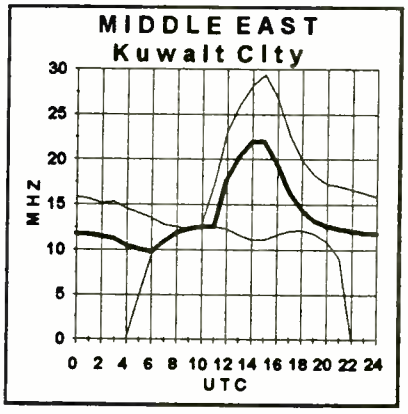


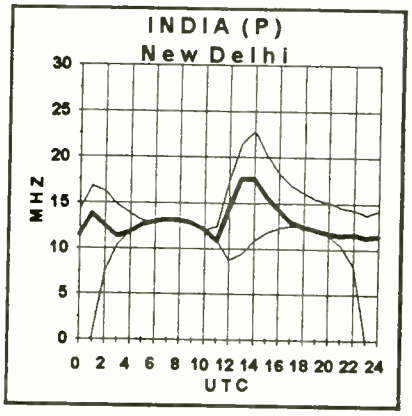


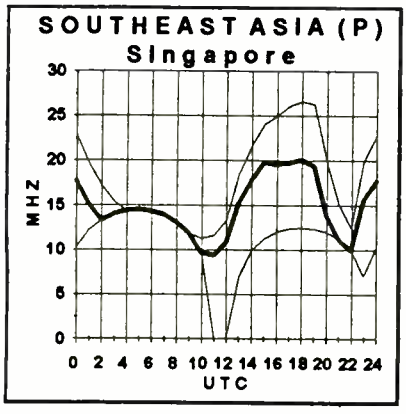


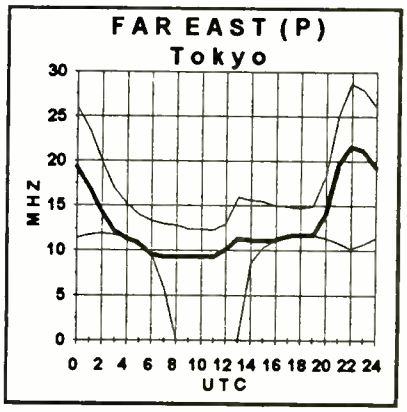


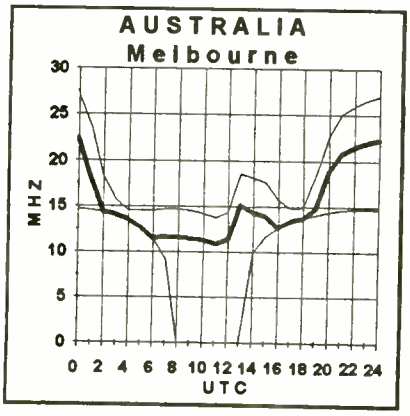






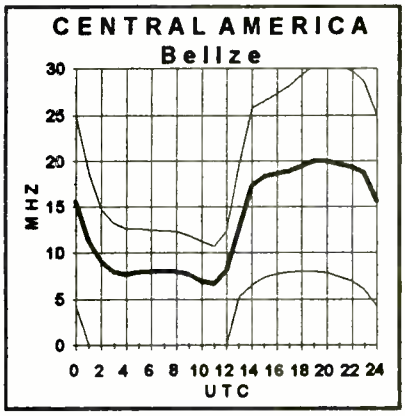


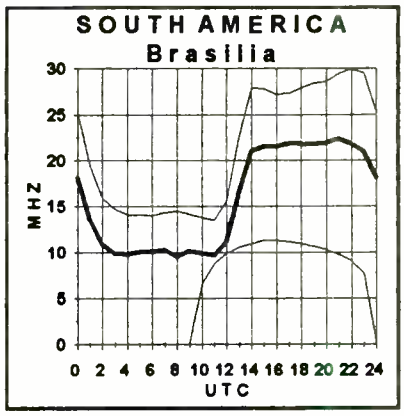


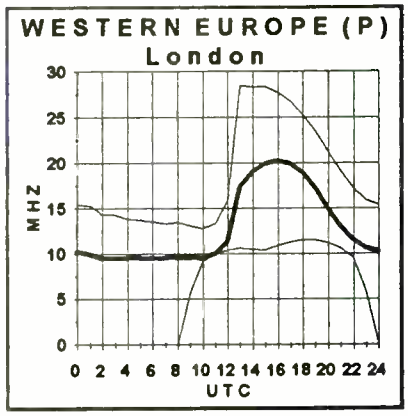


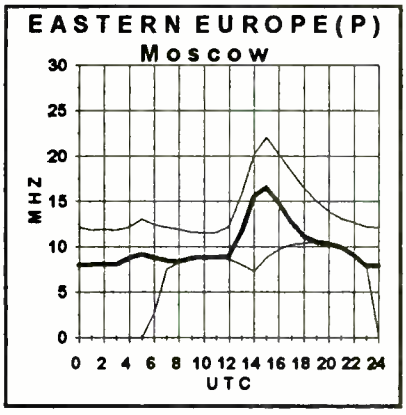
Propagation Conditions: Western United States

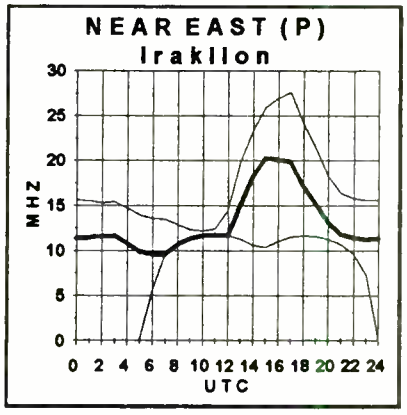
the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances. Due to the decrease in the sun cycle, the graphs have been adjusted so that the maximum frequency is now 30 MHz instead of 40 MHz.

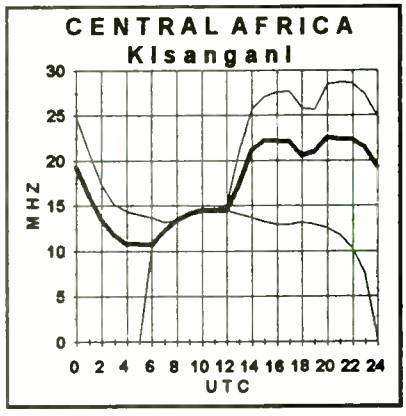


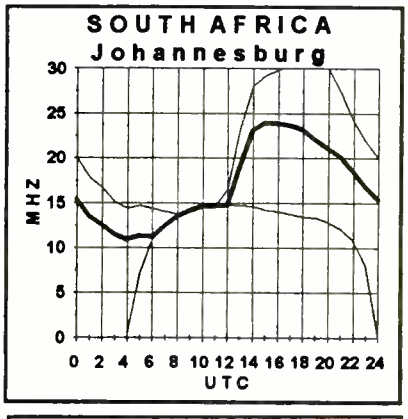


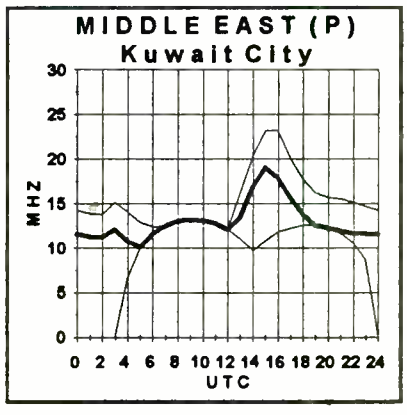


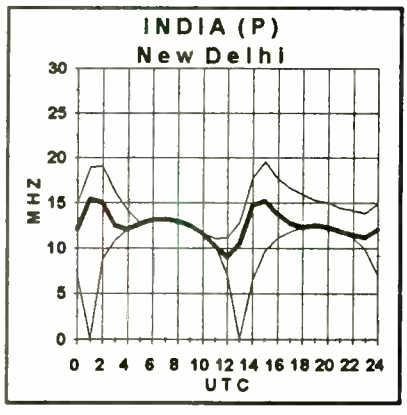


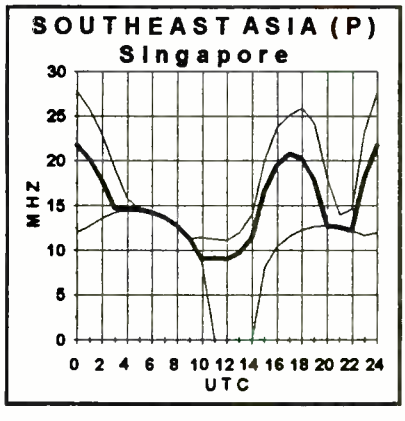


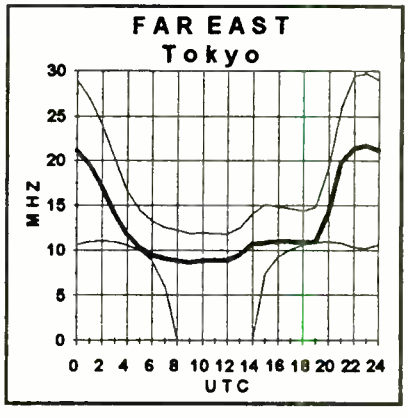


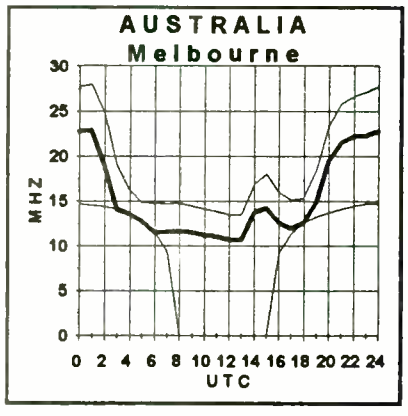












what's new?

Larry Miller

Defeat GE/ Ericsson

The proliferation of Ericsson/ GE trunked two-way radio systems is causing headaches all over scanner land. The problem is that these systems are sold to law enforcement agencies with the promise that they're "immune" to scanning. This "immunity" is accomplished through the use of a series of tones which are tagged to the end of every transmission. These tones take the form of GE's theme song, *We Bring Good things to Life*. These tones continue for approximately three seconds after end of the conversation, causing the scanner to pause before resuming its search. Meanwhile, you've missed the next transmission.

A firm called COMSEC Associates is now offering a device called the SA-78E that "determines when a transmission has ended, mutes the scanner audio, and causes it to immediately resume searching for another transmission." According to company officials, operation of the unit is completely automatic.

The SA-78E is available for Realistic PRO-2005 and 2006 scanners; other models, compatible with other receivers, are under development.

The SA-78E is available for $29.95 plus $3.50 shipping and "can easily be installed by the technically-inclined user." Detailed instructions are included with the unit. COMSEC will also factory install the unit for $20.00 (plus $5.00 shipping). Contact the firm direct before sending in your radio.

For more information call 818-502-0000 or write 2219 West Olive Avenue, Burbank, California 91506, and mention *MT*.

Lescomm Data/Tone Squelch

LesComm, a firm long-known for its ability to modify scanners, is offering a new modification for the PRO-2004, '2005 and '2006. Called the "Data/Tone Squelch," the modification enables the scanner to recognize annoying non-voice signals such as the ones heard on trunked 800 MHz systems. In short, it keeps your scanner from locking up on these obnoxious signals. With this modification, you don't need to lock out the data channel. When there is noise on them, they are simply bypassed. Also bypassed by this mod are data channels, cellular data, DVP/DES encrypted signals, IMTS and most other continuous tones and warbles.

The modification kit costs $54.95; installed it's $69.95.

Please note that while LesComm does excellent work, modifications do take time. For more information on this and other LesComm modifications, write P.O. Box 81294, Corpus Christi, Texas 78468-1294 or call 512-985-2220.

The King is Dead; Long Live the King!

The venerable Realistic PRO-2006, which has been "king of the mountain" for the past three years, has gone out of production, and Grove Enterprises has bought the remaining supply (call 1-800-438-8155 for availability). Radio Shack will soon be coming out with its replacement—the "cellular unrestorable" PRO-2007. It was a short, but memorable reign, but it's not over. Those PRO-2006's will still be chugging along for years to come.

12 Call Paging Encoder

Communications Specialists, Inc. is now offering a call paging encoder utilizing the two-tone sequential paging format. The new PE-12 is based on the old PE-2P and offers rotary dial selection from 12 individual two-tone calls. Packaged in high impact plastic case with mounting bracket, the PE-12 is configured for mobile base stations that need to signal a handful of pagers with discrete calls. The PE-1000 desktop encoder is available for fixed base systems requiring greater call capability and keypad entry.

The PE-12 sells for $129.95 and is available from stock. For information about this and other tone signalling devices, contact Communications Specialists at 426-MT West Taft Avenue, Orange, California 92665 or call 1-800-854-0547.

Turn, Turn, Turn

Grove Enterprises has announced the availability of a new accessory for the popular Scanner Beam that'll also be good news for owners of amateur VHF/ UHF antennas, or even TV and FM antennas. It's the new Grove Heavy-Duty Antenna Rotator. Featuring a super-strong motor with extra-high torque, it has been field tested in winds of up to 70 miles per hours. Special brake pads protect the drive train.

What makes the Grove Heavy-Duty Antenna Rotator especially applicable for communications hobbyists are its two synchronized motors which give you the ability to direct your antenna with precision. Extra-strength machine gears break through ice loads without binding.

The Grove Heavy-Duty Antenna Rotator is affordably priced at just $59.95 plus $5.00 UPS. Fits masts up to 2" in diameter. Requires optional 3 conductor cable. To order or for more information, call 1-800-438-8155.

Auto-Tuner

AEA has announced the unveiling of their new IT-1 Auto-Tuner, an accessory for the Iso-Loop 10-30 HF antenna. The Iso-Loop is a high-quality, high-efficiency, antenna with a mere 35" diameter. The IT-1 Auto-Tuner automatically tunes the Iso-Loop.

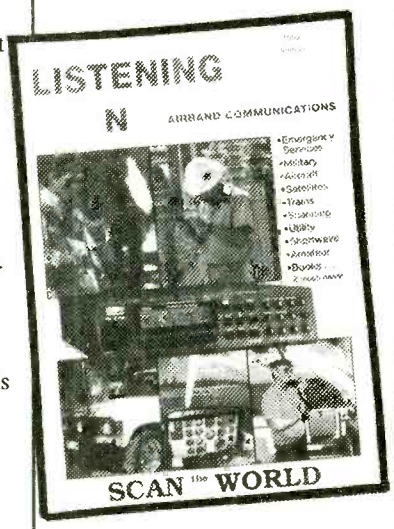
The IT-1 Auto-Tuner features a twelve button keypad with an audible beep to announce completion of tuning. It has eight programmable memories as well as a ten segment LED bar that monitors the tuning process and indicates the selected memory number. Memory back up and a built-in serial interface is also included.

The suggested retail price for the IT-1 AutoTuner is $279.00. For more information, stop in at your favorite radio store or call Advanced Electronic Applications at P.O. Box C2160, Lynnwood, Washington 98036 or call 206-774-5554.

New Radio Magazine from Down Under

MT reader/contributor Bob Bell has published the first edition of an "annual" magazine for Australian monitors, entitled *Listening In*. The attractive 48-page, first issue includes a cover story and 17 regular departments, which address communications from shortwave through satellites. Oddly, although the emphasis is on Australian communications, the feature story is a history of communications espionage in the United States.

A price of Australian $7.95 plus $3 shipping is given for the magazine. It would be advisable to write for overseas prices and method of payment if you are outside the country. *Listening In* is published by Airband Communications, P.O. Box 16, Georges Hall 2198 NSW, Australia.



Although the magazine is advertised as an annual, look for them to expand quickly; do you know an annual that starts out by publishing the month and Volume 1 Number 1? With the magazine's professional appearance and full coverage, they will soon be begged by the readers to increase the number of issues, if they did not already have plans to do so. Editor Bob Bell has been a faithful attendee at the *Monitoring Times* conventions; unfortunately, his increasing success with publications will keep him too busy this year!

Your Calls On a Pen

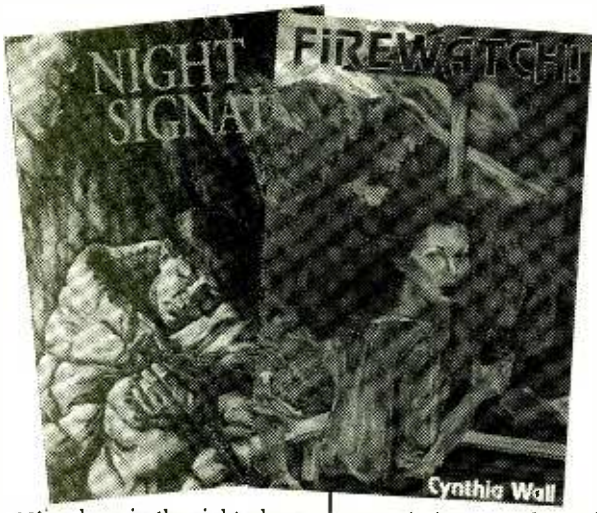
A firm by the name of Kilo-Tec is offering what it calls "high quality writing instruments for the Radio Amateur." (OK, so it's a slow month for new products; but then, have you done your Christmas shopping yet?) The Kilo-Tec Roller Ball pen can be personally engraved with your call letters. Says the manufacturer, "The smooth writing instrument is excellent for filling out QSLs, logs, etc."

The price of the KTRB pen is $19.95 plus $4.00 shipping, "comparable to writing instruments costing much more." The address is P.O. Box 10, Oak View, California 93022 or call 805-646-9645.

A Novel Approach to Hamming

Three novels, in fact, have been authored by Cynthia Wall, KA7ITT, which revolve around the hobby of amateur radio. These high suspense stories are intended for young people, especially girls, but are captivating reading for anyone.

The books accomplish two very difficult goals: they address amateur radio in a natural, unconfusing way without preaching to the uninitiated; and although they are high-adventure, the stories reflect the kinds of experiences that could be had by



any active ham in the right place at the right time.

Night Signals, the first in the series, introduces Kim, a high school senior, to a young man hiking alone in the Oregon wilderness. When he is seriously injured, Kim and a host of others become involved in his rescue. In *Firewatch!* the same young woman is working on a summer job on a lookout tower, which exposes her to wildfire, a plane crash and marijuana farmers. The most recent book, *Hostage in the Woods*, is already in its second printing.

This is highly recommended reading, but getting the young person to pick up the book in the first place is the biggest hurdle. We suggest you give one as a Christmas present, so the recipient will feel obliged to read it—then they'll pick up the other two without further encouragement!

The books are published by and available through the ARRL (225 Main Street, Newington, CT 06111;203-666-1541) and many bookstores for $5.95 each. Or, you can order an autographed copy direct from the author at $5 per title plus $1 s/h ($1.50/2 books; $2/3,4 books; FREE/5 or more!).

Guide to FAX Stations

The spectrum below 30 MHz is a rich reserve of data transmissions in an incredible variety of modes, including facsimile. FAX transmissions are almost invariably weather maps, usually for maritime interests, but there are occasionally press photos and TELEX correspondence as well.

Joerg Klingenfuss's *Guide to Facsimile Stations* is a powerhouse of information, not only identifying frequencies, users, modes and broadcast schedules, but containing exhaustive chapters on equipment, techniques, interpretations of weather charts and meteorological satellites as well.

The new 13th Edition is available in the price range of $35 from many *MT* advertisers.

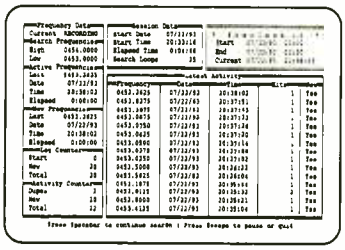
Canadian Shack Problems

In other news, there are reports that Intertan, the company that operates about 800 Radio Shack stores in Canada, is in financial trouble. The company reportedly lost 45 million dollars last year. Officials from Intertan have reportedly met in Fort Worth, Texas, with their suppliers and creditors. Intertan President Jim Williams says that much of the debt came from a decision to close its European operation.

The Automatic Scanner

In the closest you can get to a scanner monitoring post with no human monitor, the latest version of Sherlock, "The Computerized Frequency Detective," is now available. Sherlock 3.0 is a computer-control package designed to work exclusively with the Commtronics HB-232 Interface—a modification allowing the PRO 2004/5/6 series scanners to accept computer control.

"Detective" is an apt description of this software, since it allows completely unattended searching and logging of new active frequencies. Although the press release does not specify, the newest feature in this latest release appears to be its ability to not only control the scanner, but to also control a tape recorder or VCR for unattended recording of the activity. Never miss critical communications while you're away from home again!



Here is a description of how Sherlock works, from the press release: "When Sherlock finds an active frequency, it instantly looks through a list of frequencies to detect whether a record of activity exists. If the active frequency is not found, Sherlock adds the new frequency, time and date to the file. If Sherlock has a record of the active frequency, the existing record is updated with the current time, date and total number of activities.

Whether the active frequency is new or not, you have the option to record or monitor the activity. Once the file is updated, Sherlock automatically commands the scanner to continue searching for the next active frequency. All this occurs in a fraction of a second!"

Sherlock requires an IBM compatible computer using DOS 3.0 or higher, 640K RAM memory, Commtronics HB-232 Scanner Interface hardware and software (around $195 from Commtronics Engineering, P.O. Box 262478-M, San Diego, CA 92196-2478); necessary for recording is a tape recorder or VCR with pause jack and one HB-232 user switch and appropriate cables.

Sherlock sells for $44.95 plus $3.50 s/h. For more features and specifications, write Datafile, Inc., P.O. Box 20111, St. Louis, MO 63123.

Glowing Bye-Bye

While this is actually a "What's New" column, we're going to take a moment to say a goodbye to something old. We've received word that the last general purpose glass receiver tube built in the United States was assembled this past summer in Owensburg, Kentucky.

Since 1922, millions of tubes had been built in Owensburg by a succession of companies: KenRad, General Electric and MPD. At one time, some 6,600 people were employed in the production of the tubes, fueling the nation's seemingly insatiable appetite for radios and TVs.

Today, tubes are still in demand by radio hobbyists; many musicians and audiophiles prefer the "warm" sound that tubes contribute to amplifiers. According to reports, there are still tubes being manufactured in China and the former Soviet Union.

And thus we close with a moment of silence for the passing of yet another era. We flip the switch and watch as the warm, orange glow of the vacuum tube fades from the wall behind the set. Goodbye, old friend.

Bob Grove, WA4PYQ

Yupiteru MVT-7100

DC to Daylight (almost) Handheld Scanner

Guest Reviewer, Peter Jennings, Jennings Communications

SPECIFICATIONS

Guaranteed Range	530 kHz to 1650 kHz
Display Range	100 kHz to 1650 kHz
Step Frequency	50 Hz, 100 Hz LSB, USB Only 1 kHz, 5 kHz, 6.25 kHz, 9 kHz, 10 kHz, 12.5 kHz, 20 kHz, 25 kHz, 50 kHz, 100 kHz
Modes	Wide FM, Narrow FM, AM, LSB, USB
Sensitivity	
0.530 - 2.0 MHz AM	< 10 µV (10 dB S/N)
2.0 - 30 MHz	
AM	< 1.5 µV (10 dB S/N)
LSB/USB	< 1.0 µV (10 dB S/N)
FM	< 1.5 µV (10 dB S/N)
30 - 1000 MHz	
AM	< 0.5 µV (10 dB S/N)
LSB/USB	< 0.5 µV (10 dB S/N)
FM	< 0.5 µV (12 dB S/N)
WFM	< 0.75 µV (12 dB S/N)
1000 - 1300 MHz	
FM	< 1.0 lV (12 dB S/N)
Memories:	
Channel Memories	1000
Search Pass Memories	500
Band Memories	10
Priority Channel	1
Scan/Search Speed	30 channels per second
Antenna Impedance	50Ω
Antenna Connector	BNC
Power Supply	4 AA Ni-Cad (supplied) 12 VDC Power source (AC Adapter supplied) 12 VDC auto cigar plug (supplied)
Power consumption	140 mA Normal 100 mA Sleep mode 10 mA Battery Saving Mode
Audio Output	100 mW (4.8V 8Ω, THD 10%)
Operating Temperature	0°C to 50°C (32° F to 122° F)
Dimensions	64.4 mm (W) x 155 mm (H) x 38.2 mm (D) 2.5" (W) x 6.1" (H) x 1.5" (D)
Weight	320 grams (excluding antenna, including batteries) 11 oz.

I spend a lot of time on the road. For many years it has been my fantasy to carry with me a handheld receiver capable of letting me: keep in touch with SSB and CW activity on the HF ham bands; listen to AM SW broadcasts; monitor the local FM repeaters on 2 meters and 70cm; eavesdrop on the far more exciting police activities of the big cities I visit; and listen to my favorite TV shows while driving or flying. Since this is a fantasy anyway, it may as well pick up aircraft AM so I can be aware of what is happening in the cockpit.

It took a long time, but technology finally caught up with my dreams. For several months I have been carrying the new Yupiteru handheld scanner with me everywhere I go. The MVT-7100, affectionately known as the "Yupi," covers the entire spectrum from 530 kHz to 1650 MHz with USB, LSB, AM, WFM, and NFM reception modes available on all frequencies.

The scanner weighs in at 12 ounces, including the 4 NiCad AA batteries (supplied), and the 21" telescoping whip antenna. It measures 2.5" (W) x 6.1" (H) x 1.5" (D), just a tad smaller than the PRO-43. The radio comes with an AC adapter/charger from some dealers (check the ads), a 12V auto cigar lighter power cable, a belt clip, and a hand strap. An optional carrying case is available.

Overall, the size and weight are very comfortable for handheld use. Commands and frequency entries are made on a solid feeling 20 key pad on the front of the unit. The LCD display is exceptionally easy to read with the radio in any normal operating position. It can even be used with the radio horizontal on a table (the whip antenna has an elbow just above the BNC connector to make this useful). Two green LEDs provide adequate backlighting for night time use. The sound quality tends to the bassy side which I find a pleasant change from narrow communications audio when listening to SW broadcasts, FM music, and TV audio.

There are so many functions and operating modes available that it would be difficult to say that the Yupi is easy to learn. On the other hand, I found the command entry intuitive and would not want to give up any features in exchange for a simpler user interface. Once you have learned all of the options, the radio is easy to use. The complete reference card provided here shows all of the functions.

The 1,001 channel memories are divided into 10 banks of 100 channels. Each bank can be scanned separately with two button presses. For example, if the local fire frequencies were stored in bank 3, one would press 3 and the [SCAN] button. What could be easier than that? Scanning

and searching takes place at 30 steps per second. A separate PRIORITY channel can be monitored automatically every 5 seconds regardless of what else the radio is doing.

Channel memory entry is made exceptionally efficient by the automatic incrementing of the memory number after each entry. By entering each frequency followed by the [MW] key, one can rapidly copy a long list of new frequencies into the scanner.

Another unique feature useful for cramming multiple services into the same scan bank, is the MODE SCAN. This mode will scan one to four memory banks, stopping only on those channels of the desired mode. For example, the FM police channels and AM aircraft channels could be entered into the same bank. Scanning for AM only checks the aircraft frequencies. Scanning for FM only checks the police frequencies.

If a channel is temporarily blocked by an open mike or a birdy from your PC, it can be locked out of the scan by setting the SCAN PASS for that memory channel. This feature is invaluable.

Ten band search memories allow you to search a range of frequencies automatically. For example, the top and bottom frequencies of the two meter ham band can be entered into BAND SEARCH memory 1. Pressing 1 and [SEARCH] will then automatically scan the entire frequency range in the selected mode until a signal is found.

Of prime importance when using the search mode are the 500 search pass memories. Entering a frequency into one of these memories will cause the radio to skip that frequency during a continuous band search. The folks at Yupiteru knew what they were doing when they designed this feature! The SEARCH PASS memories can easily be cleared later when you want to restore full search coverage.

It is the special features that give this little handheld scanner the feel of a full-sized professional receiver. The 15 dB attenuator can be programmed to operate on any individual memory channel or enabled manually when needed to reduce overload from a strong signal. The scan delay is programmable for 2 or 4 seconds after the signal disappears. Scan resumption can be made automatic in 5 seconds using the SKIP function. Three battery saving modes give you full control of the battery consumption vs. operating delay time. A 9 segment S-meter on the LCD display shows received signal strength and makes antenna adjustments and comparisons a breeze.

Sensitivity

On VHF FM, the unit claims a sensitivity of 0.5 µV for 12 dB SINAD. Actual performance was noticeably superior to almost all handheld and many desktop scanners, but not as sensitive as typical ham HT's (which have filters to restrict their frequency range). Signals barely heard on other scanners are full quieting on the Yupi. Despite the extra sensitivity, the triple conversion operation reduces intermod interference to a minimum in a crowded RF environment.

On shortwave, the claimed sensitivity is 1.0 µV for 10 dB SINAD on SSB and 1.5 µV on AM. This compares very well with other portable SW receivers, but is not as sensitive as a communications receiver. Nevertheless, it is excellent for shortwave broadcast reception and entirely adequate for utility DXing with an external antenna. Even with the telescoping whip, lots of signals can be heard on the ham bands when they are open—sitting in the "throne room" monitoring the DX nets is a unique experience.

The factory claims for sensitivity are very conservative. Performance figures of .16 µV for 12 dB S/N at 145 MHz NFM and 0.23 µV for 12 dB S/N at 10 MHz SSB have been reported in laboratory tests by a British publication.

Shortly after receiving the Yupi, I set out on a five hour drive to the Visalia DX Convention. With a center loaded whip antenna (Radio Shack 20-006 $9.95) mounted on a mag-mount in the center of the trunk, I was able to listen to the BBC World Service on shortwave for the entire drive, switching frequencies as the propagation changed.

Antennas

The supplied telescoping whip is adequate for VHF operation, but improved performance can be achieved on both VHF and shortwave with the above-mentioned loaded whip or a coil-up wire antenna (Radio Shack 278-1374 $8.95). At home, an external antenna will prove well worth the trouble. I found my roof-mounted ASA 9 dB gain 10 vertical (Model 9209 $32.43, ASA Box 3461, Myrtle Beach, SC 29578. 800 722-2681) to be outstanding on all frequencies from BCB to 1300 MHz. I couldn t believe how many crying babies were out there on 49 MHz.

I was also pleasantly surprised to find that a long wire antenna did not overload the receiver as I had expected. Reception of even very weak ham CW and SSB signals was possible with a dipole antenna.

MVT-7100 Reference Card

Set Program Scan (≤10 channels/bank) nnn (MR) (PGM)	Remove channel from PGM Scan nnn (MR) (PGM)
Scan Program (P-SCAN)	Scan Program by Bank(s) N [NNN] (P-SCAN)
Set Priority Channel (Manual Entry) 1000 (MW) Check Priority Channel 1000 (MR)	Monitor Priority Channel every 5 seconds (PRI)

(ATT) Use 15 dB attenuator (stored in memory).
(DELAY) Delay 4 (vs 2) seconds before resuming.
(SKIP) Resume scanning after 5 seconds.
(BEEP) Turn keyboard beeps on/off.
(M>VFO) Transfer memory data to manual.
(FUNC) Access (Functions) labelled below keys.
(MR)(MR) Return to manual while scanning/searching.
(MR) Return to manual from memory mode.
(SPR) Return to manual from SPR mode.
(C/AC) Return to manual from SPR mode.

	Battery Save	Off for:
▲ DIAL clockwise		
▼ DIAL counterclockwise		
nn.nnn 0.100 - 1650.0 MHz	1 (SAVE)	0.3 sec
N 0-9 banks or bands	2 (SAVE)	0.9 sec
	3 (SAVE)	1.5 sec

Bank	Channels	Scan	Band	Search
1	000-099		1	
2	100-199		2	
3	200-299		3	
4	300-399		4	
5	400-499		5	
6	500-599		6	
7	600-699		7	
8	700-799		8	
9	800-899		9	
0	900-999		0	

MVT-7100 Reference Card

Manual Entry
(MODE) ▲▼ (ENT) (STEP) ▲▼ (ENT) nn.nn (ENT)

Manual Search
(Manual Entry) (SRCH) ▲▼ To change direction.

Edit Manual Entry
nnn.nn (C/AC) ▲▲ n (ENT) (ENT)

Edit Manual Entry with MHz key
(C/AC) (MHz) ▲▲ (ENT) (ENT)

Memory Write
(Manual Entry) nnn (MW)

Autoincrement
nn.nnn (MW)

Memory Read
[nnn] (MR) ▲▼

Memory Erase
nnn (MR) (MW)

Set **Band Search** [scan a frequency range]
(MODE) ▲▼ (ENT) (STEP) ▲▼ (ENT) (BW)
nn.nn (ENT) ♪ nn.nn (ENT) ♪ N (ENT)

Use Band Search
N (SRCH)

Stop Search
(SRCH)

Search Pass
(PASS)

Erase Search Pass
(SPR) ▲▼ (PASS)

Scan All Ch.
(SCAN)

Channel **Bank Scan**
N [NNN] (SCAN)

Stop Scan
(SCAN)

Scan Pass
(PASS) CH blinks

Erase Scan Pass
nnn (MR) ▲▼ (PASS)

Scan by Mode (all banks)
(MODE) ▲▼ (ENT) (M-SCAN)

Scan Selected bank(s) by Mode
(MODE) ▲▼ (ENT) N [NNN] (M-SCAN)

Birdies

Some internally generated interference has been reported near 460 MHz. The exact frequency seems to vary from scanner to scanner and to depend on battery condition and temperature. All wideband receivers will have some birdies to contend with. Whether they matter to you will depend on what frequencies you wish to listen to. The MVT-7100 is remarkably free from spurious emissions and intermod interference for its size and wideband capability.

Complaints

It is hard to criticize a radio that offers so many excellent features and truly outstanding performance, but there are always one or two areas for improvement. If I had my choice, I would have liked a stereo headphone jack so that I could use my comfortable "Walkman" headphones without having to use an adaptor or wire a new plug. Unfortunately, in the only performance advantage the ICOM R-1 has over this radio, the FM broadcast reception is mono rather than stereo.

Upper and lower sideband reception were implemented by offsetting the tuning 1.4 kHz and injecting a carrier. This results in the displayed frequency reading 1.4 kHz high on USB and 1.4 kHz low on LSB. As the selectivity does not appear to be reduced from the AM 10 kHz in these modes, it is possible to receive both sidebands in both modes equally well. I would have preferred to see an accurate frequency readout and, given the lack of a narrow filter, a single SSB mode. It is important to remember to add or subtract the appropriate offset when entering an exact frequency in one of the sideband modes.

The Bottom Line

The Yupiteru MVT-7100 is highly recommended. The relatively high price is fully justified by its outstanding performance on both shortwave and VHF/UHF frequencies. Yupiteru has set a new standard for full-coverage handheld scanners that is going to be exceptionally hard for the competition to beat.

Although one or two U.S. dealers are selling the Yupiteru, they cannot do so legally, since the Yupiteru is not type-accepted by the FCC. It is, however, legal to own, and they are easily obtainable from overseas dealers such as Javiation, who sells the MVT-7100 for £385 (around US$565, depending upon the exchange rate), including Federal Express 2-day shipping. Contact Javiation, Carlton Works, Carlton St., Bradford, W. Yorkshire, England BD7 1DA. (011-44-274-732146, fax 011-44-274-722627). MT

Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

Sony ICF-SW77 Portable (Revised)

Sony's top-of-the-line ICF-SW77 portable has had an exceptionally tough row to hoe. It was first brought out as a high-tech replacement for the popular ICF-2010, but it had so many problems that it had to be withdrawn from the market. Sony has fixed it up and reissued it, but the old '2010 reportedly continues to sell better.

Improved technology has meant the world to world band listening: Advances like digital tuning have made shortwave attractive to millions who otherwise wouldn't have had anything to do with it. So it was probably just a matter of time before somebody decided to take this process a few steps further.

"Windows" Operating Environment

With the '77, Sony has done just that, and more. This model is almost as much a computer as it is a radio, and that's why you're probably going to either love it or hate it.

The '77, which lists for $625, stands out because of its exceptional tuning system. If you know personal computers, you'll probably be familiar with Microsoft's Windows or Apple's MacIntosh—where you choose what you want from menus on a screen.

That's pretty much the way it is with the '77. You can store stations in memory—complete with station name, schedule information and country. This information resurfaces on "pages," or menus, and then you select what you want. The radio will even do things like finding the strongest frequency for a station you want to hear.

The problem is, if that station is on the same frequency as another and more powerful station—or if the operating schedules have changed—you may wind up hearing Beijing instead of Belgrade. Still, it's pretty clever stuff.

Complex...and No Help Menu

That's the good news. Less good is that this makes the radio really complicated to operate, and there's not even a help menu. What it comes down to is that if you're happy in a menu-driven computer environment, or, if you enjoy solving puzzles, you're more likely than most to be happy—even delighted—with this radio.

Generally First-Rate Performance

There's no puzzle as to how well it works, though. For the most part, it performs right up there with the very best of world band portables, including on FM and AM. And, to help clean up reception on shortwave and AM, it has synchronous detection with selectable sideband, just like the ICF-2010.

What about rumors that the '2010 is being discontinued? Dealers in Europe tell us that the '2010 is now being distributed by Sony only in North America. Yet, it is still found on sale in other countries. (Sony's world headquarters has not replied to our requests for official information.) It's a shame, but put yourself in Sony's position. It must be embarrassing to be offering a super-advanced new radio and find that it's being outsold by an older—almost elder—model.

Problem is, Sony appears to be paying more attention to the lure of technology, rather than the fact that the marketplace is made up of real people with real preferences. A good example of this is how these two radios call up station presets. You have to push all kinds of buttons and stare at a screen to call up a preset station on the '77. On the legendary '2010, which lists for almost $200 less, all you do is push one button, one time.

On the other hand, synchronous detection on the '77 is just like what's found on the '2010, except it's easier to operate. This advanced-tech feature really helps reduce distortion and adjacent-channel interference. Not only on shortwave, but also on AM. There's no other portable manufacturer that comes close to doing this as well as Sony.

Can new technology replace an old standard? Although the Sony ICF-SW77 is much improved, its only real chance to succeed may be to remove the ICF-2010 from the market.

Superior bandwidth filters also help with adjacent-channel rejection, or selectivity. These aren't just technological games—you can easily *hear* the difference. Although the '77 sounds more muffled on shortwave than does the '2010, the '77's wide bandwidth is clearly more effective than that on the '2010.

In fact, all measurements of the '77's performance come across as first-rate, except its sensitivity to weak signals and dynamic range. Unfortunately, those two are a pretty nasty combination if you're into DXing. You'll know your radio is suffering from this problem if up and down the dial what you hear what sounds like murmuring in an "L.A. Law" courtroom scene.

You can get rid of this by shortening the antenna and other means. But the catch is that this also reduces sensitivity to weak signals, which is what DXers are after in the first place.

Dreadful Chugging when Tuning

There are some other problems, too. Such as a thin antenna, and audio that's good, but not quite equal to that of some cheaper models. But the real drawback is that the synthesizer chugs terribly when the tuning knob is used, so you can't hear anything but a syllable here and there.

This makes bandscanning all but impossible, which isn't right. It doesn't make sense to charge top dollar for a radio that can't even do what any old radio does properly.

That really brings us back full circle. If you use the '77's Windows-type operating system, you won't be using the tuning knob, so you won't notice the chugging. And if you do want to bandscan, it has a fancy automatic scanner that will do it all for you without your having to so much as touch a knob. But you won't find weak signals that way, because the scanner sails by them.

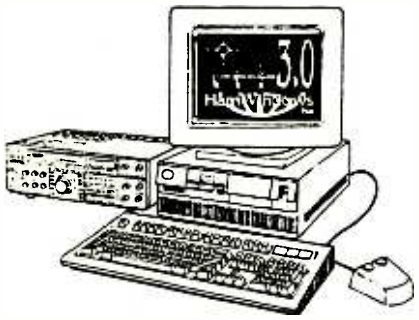
The Bottom Line

This is a real specialty radio. Once you've got it programmed correctly, and assuming you keep that programmed material up-to-date, it will do all sorts of station-finding handstands for you. There's just *no* other portable out there that will do this.

The sticking point is whether all this automation is technology for technology's sake, or represents a real improvement over conventional tuning. It is something you'll have to decide for yourself, and the only way to do this is to try one out. Unless you know somebody who has one, the best way is to buy one on the condition that if you're not satisfied, you can return it for a refund.

MT

John Catalano



Another Look Through HamWindows 3.0 Plus

When we shut down the computer last month, we were in a program called Ham Windows Plus 3.0 (we'll called it HW+), by California Software. This is a complex program which may meet the definition of a true total listening environment program. Repeating last month's WARNING: This is a sophisticated program which takes time to master and upper end computer equipment and receivers to run. Is it worth the effort? This is the purpose of our mission and quest. Let's power up.

We were in the SWL Window section exploring features such as Map Window, showing a map of the country of the broadcaster whose schedule we had called up. Also, we saw how Almanac gave us numberous details about the country, its people and its location relative to our listening station. These features sit along the right side of the screen as symbols.

The symbol which looks like a Ying and Yang, or the flag of South Korea, is the Greyline Window. We have discussed the use of such a program in previous columns. In short, it shows graphically, on a map, the location of the sun's terminator (no, not Arnold): the separation between the parts of the world in daylight and those in night. This can affect the propagation of the signal and the maximum usable frequency.

For example, on the lower frequencies a "dark" path is preferred. Also locations right on the day/night line experience uniquely enhanced propagation conditions. HW+ reads the time of day and date from the computer and then calculates and redraws the location of the terminator every minute on the map! We have reviewed other programs which have this feature, including Ham Companion and some Shareware/Public Domain programs such as Terminat.

Clicking the Utilities icon brings up ten more symbols. Clicking on the first one on the left shows the frequencies that USA hams holding different classes of licenses are able to operate. The next symbol, which looks like a ruler, converts linear measurements between the English system and the metric system. In a similar way, the thermometer icon converts between Celsius and Fahrenheit. Nice, but not really a good use of this powerful computer system; the same can be said for the Phonetic letter identifier.

The next icon displays distance and bearing information for the listening station to the transmitter. These types of Great Circle programs are also available from other sources, including shareware. Then comes a dot and dash icon (Morse for the letter A) which displays the Morse code. Nice, and handy for those of us who hunt beacon stations. A letter Q indicates a utility which displays the Q signals and their meaning. These are used by hams and some public services, and are useful for SWLers and some scanner monitors.

The last remaining two utilities are pretty useful, with the first being a graphical bandplan from 300 kHz to 3 GHz showing what services are licensed for which frequencies: Very useful for signal hunting hounds. Finally the RST (Readability, Signal Strength and Tone) convention of reporting signals is displayed by clicking the RST icon.

A feature of HW+ that I thought very useful to hams is its ability to use Buckmaster Publishing's HamCall CD-ROM (Route 4, Box 1630, Mineral, VA 23117 for $50 plus $5 shipping; which we looked at last month) without leaving the HW+ program! There are many more features of HW+ that time doesn't allow us to discuss.

Putting HW+ to the Test

"All the features sound great, John, but how well do they work?" Excellent question, people. Let's go back to the SWL (Shortwave Database Window) function that we previewed last month. Here the listener selects pre-saved frequency lists to control the tuning and mode of his or her receiver. For example, included with HW+ is a list of shortwave broadcast stations. Let's say we wanted our receiver to scan all the frequencies listed for Radio Netherlands.

By selecting Radio Netherlands, the bottom half of the screen becomes 24 horizontal lines, each containing frequency and time data for Radio Netherlands. By clicking the top left corner of the database box you can start to scan the displayed list of frequencies — if you have a few years to spend in front of the radio! The day I tried to do this using an ICOM R-71A I had major problems: incredibly slow scanning (17 seconds for EACH new frequency) and total frustration at wasting a whole day! Yes, it happens to all of us sometimes. A call to California Software that night brought little but the promise of a return call. I shut off the equipment for the night in aggravation.

Well, the next day came and at 8:00 am California time both Bob, of Technical Customer support, and Mark, of Sales, were on the phone to me. When I explained the problems I was having, Bob said he would try and repeat them. Since the final version of the software was less than two weeks old, this was the first reported problem. To California Software's credit, Bob called back within three hours and confirmed the problem on their system.

With apologies and thanks he promised to get the designers working on a fix immediately. Four days later he was on the phone with the news that the problem had been traced to a file and this was being worked on as we spoke. Twenty-four hours later I had a new program in my hand!

That night I prepared the family for another round of frustration and set off to try the fix. Loading - Perfect. Same instructions. Same look to the new program. Nothing seemed changed until I tried scanning frequencies in the SWL Window mode. YES!! Approximately one second scan time per frequency; and even faster on duplicate frequencies!

Sure, it could be faster. But Bob had delivered the goods. I called him and told him of my good results and thanked him for his effort. But I was worried about other customers who had

received HW+ during this period. Bob assured me that the revision to the offending file was made available on the California Software BBS, details of which are found on page 210 in the manual.

I was impressed with the cooperation and positive team effort from California Software. None of the technocratic "it's great the way it is" attitude that we hear all too often. These guys were very professional and it shows in all facets of Ham Windows Plus. The HW+ now is quite usable for monitoring and hamming. We are now getting so close to a complete monitoring environment, we may even be there. However HW+ still has many features we haven't even touched on.

What More Could One Ask?

The Windows 3.1 environment is still, in my estimation, a little uncertain. If you open up too many windows, strange and not so wonderful things happen. Being a very complex program which tries to give the user the maximum power potential of a 386/486 computer, HW+ takes Windows to its operating limit and does some pretty fancy screen graphics on the way. In order to handle all this, California Software has a file included in HW+ called ToolBook. The current version is 1.5, with version 2.0 promised (in the readme file) sometime in 1993. This, they say, will help with some of the memory management complexities which could have some user noticeable operating "side" effects. These are not usually serious, only bothersome.

In my opinion the frequency scanning rate is now acceptable. But I would like to see it capable of running at twice its current rate.

Although the Windows icon environment is supposed to make user interface logical and reduce the need for the manual, HW+ packs a lot of functions and data into one program. Therefore you CANNOT get along without the manual next to your side; that is, if you want to explore the full power of the program. For example, I could not figure how to scan the displayed frequency list. No click on box labeled SCAN in sight. A look into the manual showed that a click on an unmarked corner brought up the SCAN Menu. In HW+'s defense, I must say that this is a result of the largest number of features, data and operational options that I have ever seen in a single monitoring/ham program.

Summary of HamWindows Plus Version 3.0

There is no question that this is a professionally produced landmark program. Nothing that I have seen to date compares to it in power. However, it is not for the novice or first time computer/radio person. This is high performance in both price, at $189.95, and operational features. About 25% of the program is useful only to Ham operators.

Some features have been recently added and therefore may not work in an automatic manner. This is the case with SunSpot Breaker, a very unique feature which checks the bands for activity, correlates it to the time of year and the sun's activity cycle. Then it guides the user to the best listening frequencies. However, this requires a receiver with an S meter which can be read digitally by the computer: not exactly a common receiver feature.

As we experienced, the customer service is excellent. Overall, for the serious computer/radio enthusiast, who has some experience with other more basic radio/tnc control programs, who wants more, and who has $190 to spend on software, HamWindows 3.0 Plus, Personal Communications Control Center, is the answer. It's available from California Software, Inc., 2121 E. Pacific Coast Hwy, #220 Corona del Mar, CA 92625-3235, TEL 714-729-4222.

Next month we'll put another Windows program, Audio Spectrum Analyzer from Pioneer Hill Software, through its paces, literally "looking" at some digital shortwave signals. Listening software is developing rapidly. And so the total listening environment concept takes a giant leap from our imagination toward becoming a reality.

MT

Doug Demaw, W1FB

Build a BC-Band DX Receiver

Reaching out for those distant AM BC-band stations is not accomplished easily with most small imported radios that use a built-in ferrite loop antenna. These receivers do not have provisions for connecting an external wire antenna. If we attempt to couple a long piece of wire to the built-in loop by means of a multiturn link, we hear a mish-mash of shortwave signals among the desired BC-band signals. This is caused by oscillator harmonics that are present within the usual single mixer/oscillator transistor.

Having experienced this problem many times, I decided to design a simple, inexpensive BC-band receiver that does not suffer from these ills. It is designed for short and long antennas. The short antenna (a few feet of wire) is made to perform well by using a single-stage active antenna (untuned RF amplifier).

The Circuit

Figure 1 contains the circuit diagram for our receiver. With the exception of audio amplifier U1, each stage uses a single transistor. Bipolar and FET devices are used. They cost less than ICs and are easier to keep from self-oscillating. The usual loop antenna is replaced by a toroidal inductor which does not pick up signals when no antenna is attached. This ensures that all signals enter the receiver via the outdoor antenna. This helps to discriminate against the man-made noise that is present in the phone and electrical wiring within the house.

FL1 is an IF filter that provides selectivity for separating the stations. It consists of two lightly coupled 455-kHz IF transformers that are connected by a 10-pF top-coupling capacitor (C10).

Separate tuning capacitors are used to tune the oscillator and peak the mixer input circuit. Normally, these capacitors are ganged and the circuits are adjusted to track with one another for maximum signal strength. It is not an easy matter for a beginner to make the circuits track from 550 to 1600 kHz. Therefore, I have separated the tuned circuits to make the job easier for you.

The LM386N (U1) audio amplifier IC provides up to 0.5-W of undistorted audio output. The audio quality of the receiver is enhanced by the use of an infinite-impedance detector (Q4) rather than the usual diode detector.

The receiver may be powered by any dc voltage from +10 to +12. The peak current (at 12 V) is on the order of 200 mA. Therefore, you need only a small +12-V regulated power supply. Many surplus plug-in wall transformers are suitable for powering this circuit. A 12-volt car or motorcycle battery may be used for portable operation.

Automatic gain control (AGC) is developed by amplifying the IF energy at Q5, then changing it to dc by means of D1. The resultant negative voltage is applied to the base of Q2 to reduce its gain. The stronger the incoming signal the greater the -dc voltage and the lower the Q2 stage gain. D2 is a polarity guarding diode, just in case you mistakenly cross-polarize the power leads!

Two antenna inputs are provided. One is for a long outdoor antenna (routed to L1). The other input is used when an active antenna and a short hank of wire (20 to 50 feet long) must be used for the antenna.

Gathering the Parts

Keep an eye out for scrapped BC-band transistor radios. You can burgle many of the parts for Figure 1 from a junked radio. The IF and oscillator transformers generally have the same characteristics and pinout as those specified in this article. Many of the resistors and disc ceramic capacitors can be taken from an old radio. Likewise for some of the electrolytic capacitors. You may want to use the two-gang

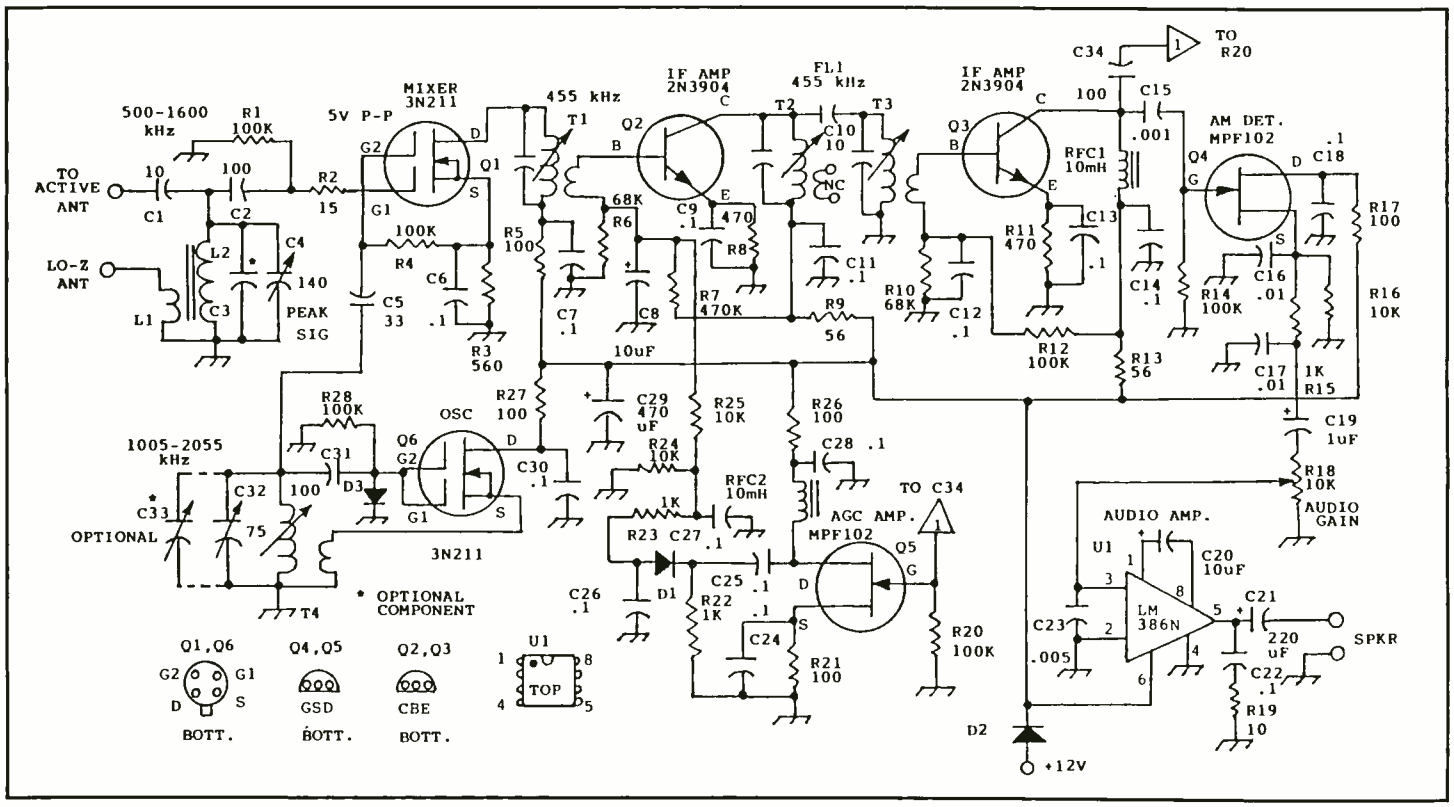


Figure 1

tuning capacitor for C4. Simply connect both sections in parallel to obtain sufficient capacitance.

Hosfelt Electronics and Mouser Electronics are sources for most of the components in Figure 1. Both companies offer free catalogs. Their addresses are listed at the end of this article.

Drilled and plated PC boards for this project are available from FAR Circuits for $8 plus $1.50 s&h. See supplier list.

List of Parts Suppliers

FAR Circuits
18N640 Field Court
Dundee, IL 60118

Hosfelt Electronics, Inc
2700 Sunset Blvd
Steubenville, OH 43952-1158
800-524-646

Ocean State Electronics
P.O. Box 1458
6 Industrial Drive
Westerly, RI 02891
800-866-6626

The 75-pF oscillator tuning capacitor (C32) is available from Ocean State Electronics (see list) as E. F. Johnson part no. 167-4. You will want to use a vernier drive with C32 (available from Mouser and Ocean State) to slow down the tuning rate. If you have tuning capacitors that have more than 75 pF of maximum capacitance you may remove plates to obtain 75 or 80 pF of maximum C.

Summary

Part 2 of this article will contain the PC-board pattern and a parts-placement overlay. Details will also be provided for building a wooden chassis and cabinet for the radio. Meanwhile you can obtain your catalogs and commence gathering the parts you will need. Low-cost AM BC-band radios are usually available for a dollar or two at yards sales and flea markets. Don't overlook them as a cheap source of parts. Dual-gate MOSFETS (Q1 and Q6) are available from Ocean State (3N204). You may use any HF or VHF dual-gate MOSFET, such as the RCA 40673 or its equivalent.

MT

DX Tests

National Radio Club
P.O. Box 5711
Topeka, KS 66605-0711

Monday, October 4, 1993: WOI-640, Iowa State University, Communications Building, Ames, IA 50011-3241, will conduct a DX test between 3:00 and 3:30 am EDT. The test will include Morse code and numerous voice IDs. Reception reports may be sent to: Mr. David J. Knippel, WD0GAD, Chief Engineer.

Monday, October 4, 1993: KRZN-760, Denver CO, will conduct a DX test between 3:00 and 5:00 am EDT. The test will include Morse Code and numberous voice IDs. Reception reports may be sent to: Mr. Bill Harris, Chief Engineer. Mr. Harris, E&B Services, 2950 S. Birch St., Denver, CO 80222. Power for this test will be 50 kW.

Monday, October 11, 1993: WELC-1150, P.O. Box 949, Welch, WV 24801, will conduct a DX test between 12:01 and 12:30 am EDT. The test will include Morse code, voice IDs, and an unspecified selection of music. Reception reports may be sent to: Mr. John Sidote, N8PRR, Chief Operator.

Monday, October 11, 1993: KVON-1440, 1124 Foster Road, Napa, CA 94558, will conduct a DX test between 3:00 and 3:30 am EDT. The test will include Morse codes, tones and voice IDs. Telephone calls will be accepted during the test at (707) 224-1801. NO COLLECT CALLS, PLEASE. Reception reports may be sent to: Mr. Michael Martindale, KB6RQH, Director of Engineering.

Monday, October 11, 1993: KSOK-1280, P.O. Box 917, Arkansas City, KS 67005, will conduct a DX test between 4:00 and 5:00 am EDT. The test will include Morse code. Reception reports may be sent to: Mr. David Foster, N0KAT, Chief Engineer.

Sunday, October 17, 1993: WTRP-620, 806 Franklin Road, La Grange, GA 30241, will conduct a DX test between 12:00 and 12:30 am EDT. The test will include Morse code and gospel music. Reception reports may be sent to: Mr. Michael Thompson, General Manager.

Monday, October 18, 1993: WAGL-1560, P.O. Box 28, Lancaster, SC 27921, will conduct a DX test between 3:00 and 3:30 am EDT. The test will include Morse code IDs. Reception reports may be sent to: Mr. B. Len Phillips, Jr., General Manager. Power for this test will be 50 kW.

Monday, October 25, 1993: WRCA-1330, 1 Kendall Square, #1400, Cambridge, MA 02139, will conduct a DX test between 1:30 and 2:00 AM EDT. The test will include Morse code and tones. Reception reports may be sent to: Mr. Grady Moates, Chief Engineer.

Monday, October 25, 1993: KATL-770, P.O. Box 700, Miles City, MT 59301-0700, will conduct a DX test between 3:30 and 4:00 AM EDT. The test will include Morse Code IDs. Reception reports may be sent to: Mr. Donald L. Richard, General Manager. Power for this test will be 10 kW.

Bill Cheek

Reverse Polarity Protection

Some of the text and the idea for this month's article were contributed by A. W. Edwards, K5CN, of Corpus Christi, TX.

Improper connection of a DC power supply to electronic equipment could snuff a prized scanner or obliterate months of research. This, and more, can happen if you ignore the polarity, (+) and (-), requirements of your power supplies and monitoring equipment! Don't sweat it, though! There are several easy ways to ignorance-proof yourself, and to immunize your cherished equipment from reverse polarity catastrophes.

Option One

Figure 1 shows how to connect a silicon rectifier diode in a DC supply lead between circuit and power supply to protect against reverse polarity damage. The most prominent characteristic of a diode is that it conducts current ONLY in one direction! This characteristic can be put to use as shown for reverse polarity potection of most any DC powered equipment or circuit. It is generally the best procedure to connect this diode in whichever lead goes to the center or "tip" lug of the DC connector; otherwise, always connect it in series with the (+) lead of the feedline to the circuit to be protected.

The first method in Fig-1 shows the diode connection for equipment with a POSITIVE center lug feed; while the second method shows the diode connection for a NEGATIVE center lug feed. This method of reverse polarity protection is the most foolproof and affirmative of them all, but there are two important considerations to ponder before you run amok protecting everything in your shack:

1. Since the current drawn by the circuit must pass through this protection diode, it is mandatory that the diode have a current rating of at least two times and preferably four times the maximum current requirements of the circuit. If used to protect a CB radio from reverse polarity damage, then this diode should be rated at 4-amps for AM rigs, to 8 amps for SSB rigs. Following is a list of a few diodes with current ratings to suit a variety of needs:

Diode Type No.	Current rating (max)
1N4148/1N9140	.075 amp (75-ma)
1N4001-4005	1 amp (1,000-ma)
PTC-205	2.5-amp (2,500-ma)
1N5400-5404	3-amp (3,000-ma)

Note: Diodes can be connected in parallel to double the current carrying capacity; i.e., two 1N5400's in parallel can carry up to 6-amps to the protected circuit.

2. Silicon diodes have a constant voltage drop, regardless of current drain, of about 0.7-volts. This voltage drop will be subtracted from the power supply's feed voltage, leaving the balance available to the circuit or equipment. This may or may not be critical and must be considered before selecting this method. For example, if you feed your VHF/UHF scanner from an external DC supply rated at 13.8-volts, then only 13.1 volts will be left to operate the scanner. This slight voltage drop will not be of any concern for many applications such as scanners, SW receivers, etc., but it could be vital in other situations. Suppose you have a circuit that requires a regulated +5-volts. If you provide exactly +5-v , this method will result in +4.3-volts for the circuit. Therefore, you'll either need to raise the supply voltage to +5.7-volts or use another method of reverse polarity protection. (Note: Any number of silicon diodes connected in parallel will still drop only 0.7-volts.)

Option Two

In a variation of Figure 1, Figure 2 uses an inexpensive full wave bridge rectifier to assure reverse polarity protection. When properly connected this circuit will always present correct polarity to the circuit, regardless of the input polarity! High current bridge rectifiers are easy to find, but this method has the same limitations and considerations as Figure 1 discussed above, except that because two (internal) series diodes are active in a bridge rectifier, the voltage drop will be 1.4-volts (2 x 0.7 = 1.4) instead of 0.7v.

Options 1 and 2 are relatively foolproof, but they do subtract one or two diode voltage drops from the circuit to be powered and so might not be suitable for all occasions. High current requirements have special considerations, too.

In all cases, I suggest color coding the connector going to each piece of eqipment: red shells for positive centers and black shells for negative centers. If you cannot find a red plastic shell, you can paint a black one with fingernail polish, or a small bottle of hobby paint. Red is the universal color code for (+) while black is (-).

Option Three

Figure 3 shows a method of reverse polarity protection that's used by many manufacturers. A diode is connected between the (+) and (-) lines to the ciruit with its cathode to the (+) line and the anode to the (-) line. There must be a fuse in the line between the diode and the power supply! The diode "floats" across the line, with no loss in equipment supply voltage, and does absolutely nothing, so long as the proper polarity is applied. If the polarity is reversed, the diode conducts heavily, and blows the fuse to protect the circuit. During the fraction of a second that the diode conducts and before the fuse blows, there will be a 0.7-volt reverse polarity applied to the down line circuit or equipment, but this low voltage usually causes no harm.

FIGURE 1: SERIES DIODE REVERSE POLARITY PROTECTION

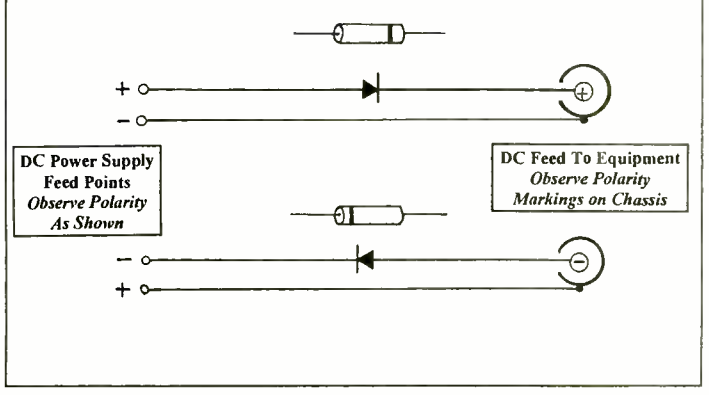
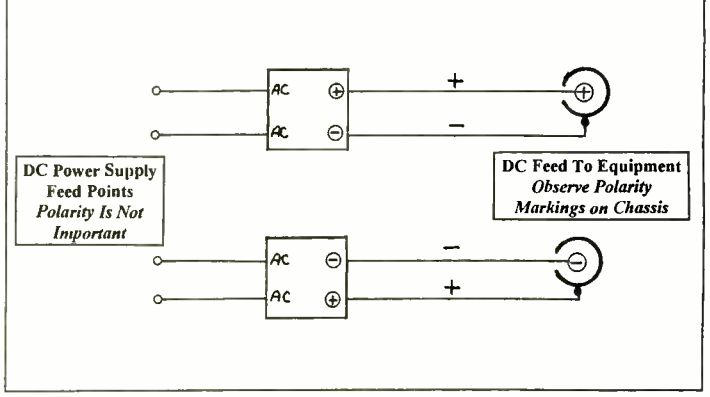


FIG-2: FULL-WAVE DIODE REVERSE POLARITY PROTECTION



Of course, the diode must be rated to handle more current than the equipment fuse, to ensure proper operation. It is probable that the diode will self-destruct with an internal short-circuit when reverse polarity has been applied, rendering it forever useless, and the equipment inoperative until it has been replaced. Citizens Band Radios have been reverse-polarity protected by this method since the late 60's. It's very effective and helps service shops make a little easy money, because the unsuspecting CBer only knows that he smelled smoke and "now the fuse blows all the time."

In emergency situations, you can clip the shorted protection diode out of circuit; restore the proper DC polarity and replace the fuse to get the equipment fully functional again. Just remember that another reverse polarity situation without benefit of the diode will send that rig to The Promised Land!

Option Four

You may also deploy a zener diode in place of the shunt diode, and it will afford protection not only from reversed polarity but also from overvoltage application. Use a husky zener diode in place of the shunt diode, wired as shown in Figure 4. Choose a zener with a voltage rating at a safe increment above the equipment to be protected: For example, to protect a nominal 12-volt equipment, a 15-volt (or the next higher voltage increment) might be used. The wattage should be 5-watts or more, depending upon the current requirement of the protected equipment.

The considerations here are to ensure that the zener will blow the fuse when required, either due to reversed polarity, or to excessively high applied voltage of correct polarity. Your electronics supplier can suggest an appropriate rectifier or diode, and show how to connect it if you're not sure of your choices.

Vehicular Electronics Caveat

If your equipment is used in a vehicle that has a positive (+) ground, exercise great care to prevent the "equipment ground" from contacting the vehicle ground. Some electronic equipment are designed with "floating grounds" which can be safely used in vehicles with either polarity of ground. CB radios usually have a floating ground, but scanners and shortwave receivers typically do not. Therefore, you must be sure of your vehicle's ground and the design of your equipment. There are some easy ways to tell:

1. Look at your vehicle's battery and determine which lead connects to the vehicle's frame. If the (-) negative lead goes to the frame (most common in U.S.), yours is a negative ground. If the (+) positive lead goes to the frame, a positive ground. Simple, actually.
2. Examine the (-) lead, usually black, that powers your equipment. If this lead somehow, some way contacts the equipment case inside, then it is NOT a floating ground and can be safely operated ONLY in vehicles with a negative ground.
3. Measure the resistance from the (-) lead, usually black, that powers your equipment, to the case or chassis of the equipment. If a low resistance or a short circuit is detected, then it is NOT a floating ground and can be safely operated ONLY in vehicles with a negative ground.
4. If the negative lead of the equipment is totally isolated from the chassis or metal case, then it is probably of the floating ground type and can be used in most any kind of vehicle.
5. In rare cases, the (+) lead of the equipment might be connected to the equipment chassis, and if so, it can be used ONLY in positive ground vehicles.

Current Flow and Diodes

This is a good opportunity to wrap up with a light explanation of the theory of current flow. In a word, electric current (amperes) is a flow of electrons from negative to positive. Each electron carries one unit of negative electrical charge, and just like magnets of the same pole, they repel or push against each other in an effort to fly apart. So when you supply a surplus of electrons at one end of a wire and a deficiency at the other end, then just like water flows downhill, some of those electrons will flow into the deficient end. Therefore, electrons are considered to flow from a surplus (-) to a deficiency (+).

This is important to remember when working with diodes and rectifiers, because current always flows from the cathode to the anode; it cannot flow the other way. A diode on the banded end is always the cathode; the unmarked end is always the anode. A bridge rectifier has four leads, two of which are marked "AC": one (-) one (+). AC current or DC of either polarity can be applied to the "AC" leads. A negative polarity will always appear at the (-) lead while a positive polarity will always be at the (+) lead. Remember these tidbits about diodes and you'll never go wrong in their application.

That's it for this month; now let's hear from YOU with suggestions, ideas, needs, and/or favored circuits to share with others. I've been thinking about some sort of a contest, so let's have your feedback on that, as well. MT

FIGURE 3: SHUNT DIODE REVERSE POLARITY PROTECTION

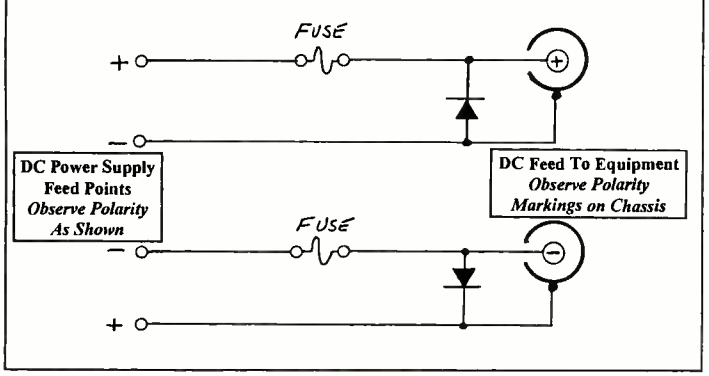
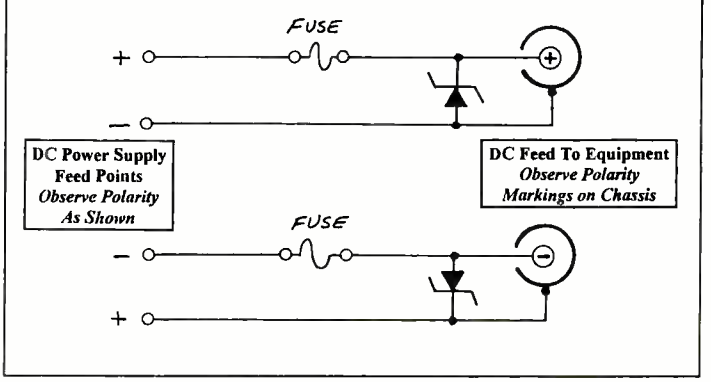


FIG-4: SHUNT ZENER DIODE REVERSE POLARITY PROTECTION



W. Clem Small, KR6A, CET

Differences Among Dipoles: The Right One for the Job

Last month we covered construction of a halfwave horizontal dipole antenna. This month we'll discuss some other factors about dipoles which we didn't have space to cover then.

Physical Placement

Most dipoles used for HF are mounted with their length running horizontally (fig. 1A). The reason is primarily for convenience: the lengths needed for HF (from about 160 ft to 16 ft) are not easy to mount vertically. The radiation-reception pattern of a horizontally-mounted halfwave dipole has a sharp null off each end, while a vertically mounted one is nondirectional. On the other hand, the nulls are so sharp (narrow) that the horizontally mounted dipoles are essentially nondirectional unless the received station is directly off one end of the antenna.

Vertically mounted dipoles are more common on VHF or UHF, since the shorter lengths used for those bands are not so difficult to mount vertically (fig. 1B). The vertical polarization thus obtained is standard for many bands in this frequency range. We're usually not so concerned about polarization on the HF band. This is because changes in the ionosphere cause changes in the polarization of signals passing through it and, regardless of the HF transmitting antenna's polarization, the polarization of signals received from that transmitter may vary at random.

The elements of the inverted-V antenna (fig. 1C) are angled between vertical and horizontal. This dipole configuration gives nondirectional coverage and is easier to erect than horizontal dipoles because it requires only one tower or high-point from which to hang the elements. Due to the angle, it can also be erected in a shorter space than a horizontal dipole. This same approach can save space with a horizontal dipole by drooping its ends.

Dipoles mounted as a sloper antenna (fig. 1D) have a considerably different radiation-reception pattern from the other dipoles covered thus far. They exhibit a relatively directional pattern with its strongest response in line with the antenna and pointing away from the antenna's lowest end. If a sloper is hung from a steel tower the directionality is more pronounced. The directionality thus obtained is not equal to that of a good beam antenna, but is sometimes worthwhile if you want to favor or reduce signals from a particular direction.

Multiband Dipoles

Dipoles, like many other antennas, are basically multiband in operation: they function well at odd harmonics of the antenna's basic design frequency. Thus an antenna designed for 7 MHz functions well at 21 MHz, although its radiation-reception pattern is different for the two bands.

If we connect two or more dipoles to a common center (fig. 1E), the result is a multiband antenna which is resonant at the various frequencies of the individual dipoles which make up this antenna.

Another common multiband design is the addition of tuned circuits (traps) to a dipole (fig. 1F). Each set of traps, together with the length of wire which accompanies it, adds an additional band or resonant frequency to the dipole.

A Different Feed

Although it is extremely common to feed a halfwave dipole at its center, it may be fed at any point along its length if the impedance of that point is at least roughly matched by the feedline. The Hertz endfed antenna, sometimes called a Zepp antenna, is fed at one end with high impedance feedline. The radiation-reception pattern of the Hertz endfed and a centerfed dipole are essentially the same, although there are minor differences.

The Real McCoy

Lew McCoy, W1ICP, has made the point that an HF dipole needn't be an exact half wavelength, or even close to a half wavelength in length, to get good performance. In fact, one single length of wire can be used on many different frequencies in the HF band. It will give different radiation-reception patterns on those different frequencies, but such an antenna will perform for the directions its pattern covers. This is true at antenna lengths down to one quarter wavelength and even less.

This is not to say that a full length antenna is not better in some instances, but the shorter lengths are surprisingly close in performance to the full length under certain circumstances. If a McCoy dipole is to be used for transmitting, then a low-loss feedline and transmatch (antenna tuner) are essential.

Gravity Antennas

You may remember from your science courses that the equations for determining the amount of force exerted by electrical, magnetic or gravity

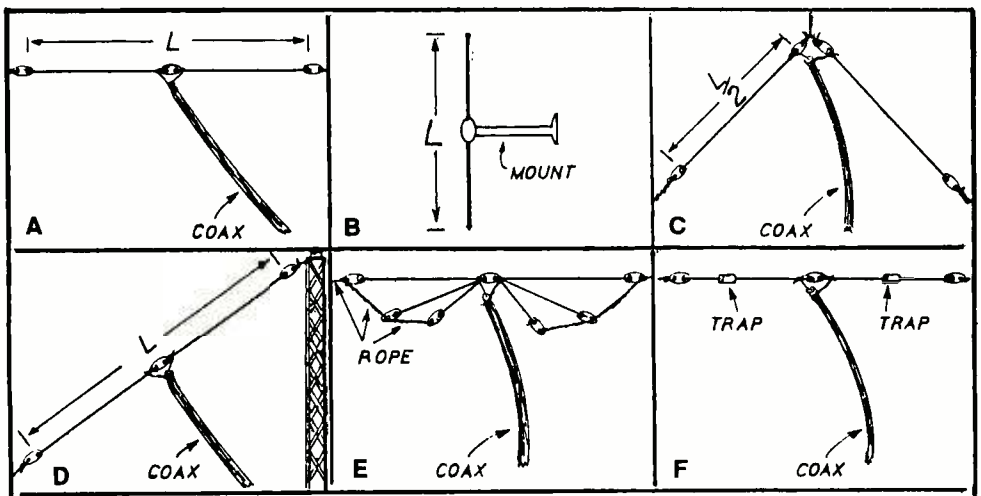


FIG. 1. SIX TYPES OF HALFWAVE DIPOLE ANTENNAS. THE LENGTH (L) OF A HALFWAVE ANTENNA IS FOUND BY DIVIDING 468 BY THE FREQUENCY IN MEGAHERTZ. THUS A HALFWAVE DIPOLE FOR 10 MEGAHERTZ IS 468./10 OR 46.8 FT LONG. IN THE METRIC SYSTEM L(METERS)=143/FREQ.(MHZ). AT 10 MHZ A HALFWAVE DIPOLE IS 143/10 OR 14.3 M.

fields are basically the same mathematical formula. Physicists believe that, in addition to electromagnetic waves which we know as radio waves, there are gravity waves which travel through space as do radio waves. Astronomers have long been involved in trying to detect what they suppose to be the strongest gravity waves: those thought to originate from such sources as black holes and neutron stars.

The large and very sensitive sensor systems planned for detecting these waves are essentially receiving antennas. It is interesting to note that research in this area is now at a state somewhat comparable to the state of research on radio waves just before Heinrich Hertz demonstrated to the scientific world that radio waves did indeed exist. Physicists are convinced that the waves are a physical reality; they just haven't been able to actually detect them yet.

Radio Riddles

Last Month

Last month we discussed the Hertz antenna and then I asked: "... who was Hertz? Also what is the Marconi antenna and how is it related to the Hertz antenna?" If you don't already know, Heinrich Hertz was the person who is credited with first demonstrating that electric waves could be produced and sent through space. We now call his electric waves "radio waves," or "electromagnetic waves," but they were once known as "Hertzian waves!" An early antenna which he devised was the center-fed, halfwave dipole!

Later, Marconi experimented with the Hertz antenna by elevating one element of the antenna vertically and removing the other element, replacing it with a metal plate on the ground. This made the world's first grounded quarterwave antenna, thereafter known as the Marconi antenna.

This Month

Which dipole antenna is sometimes called "bigote de gato" or "whisker of the cat?"

We'll have the answer to this month's riddle in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73.

MT

ask bob

Bob Grove, WA4PYQ

***Q.** Where can I get reception report forms for QSL cards? (Chris Hynes, Erie, PA)*

A. An excellent reference book on this is *QSLing With The Experts* by Gerry Dexter, available from most *MT* book dealers.

***Q.** I have a problem with multipath interference on FM broadcast in my car. I've replaced the radio and the antenna with no improvement. Would a second antenna help? (Anonymous)*

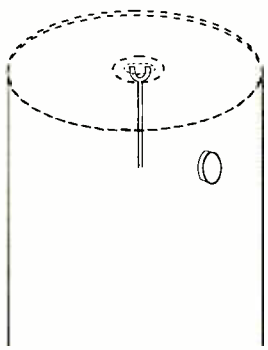
A. Quite possibly. Either a 31" automotive antenna or a magnetic mount scanner antenna separated by about three feet should give you the space diversity you need. Feed the two leads (they must be the same length) into the two-port side of a standard TV splitter, and the remaining port to the radio.

The splitter may compromise AM reception somewhat, but it is worth the experiment.

Bob's Tip of the Month

Intermittent BNC Connectors

Recently I discovered that I had an intermittent condition with my antenna connector; when I wiggled the connector, signals would come and go. A glance at the female jack on the radio revealed the cause.



High-reliability military and commercial equipment often utilize a spring-leaf construction for the BNC jack's center conductor; the flexibility of this configuration allows repeated insertions and tortions without deforming and becoming erratic.

Consumer grade BNCs utilize a stiff two-pronged, fork-like center conductor which spreads with use, becoming erratic in contact after a while. If a signal sounds scratchy or erratic when you wiggle the BNC connector, you should perform the following easy fix.

Remove the antenna connection and, using a magnifier if necessary, identify the two small prongs at the center of the female BNC jack on the radio. Using a large sewing needle or other sharply-pointed tool, carefully pry the two prongs, one at a time, slightly toward each other to make a tighter fit when the antenna connector is reattached.

***Q.** I recently saw an ad from Megatronics International, a Los Angeles mail order firm which offered long range cordless telephones. The ad says that they can't sell in the U.S.; how come? (Tom Prevo, North Platte, NE)*

A. According to a company spokesman, the units are not type accepted in the U.S. because they run excessive power (0.3-15 watts), and operate in non-telephone-allocated bands (70/74 MHz, 83/240 MHz).

***Q.** I would like to hear satellite communications on my scanner; what are some good frequencies? (Mark J. Caruso, Auburn, NY)*

A. On the hour, especially during the evening, try narrowband FM mode on 135.575, 135.600 and 135.625 MHz; this is the ATS-3 (Applied Technology Satellite) which is used, especially in the Pacific, to interlink schools, medical facilities and scientific expeditions such as Antarctica.

Try also tuning every 25 kHz from 261.000 to 263.000 for U.S. Navy FLEETSATCOM communications; while much is scrambled and digital, there is clear voice to be heard as well.

The Russian MIR space station downlinks on 143.625 and many Space Shuttles include ham radio on 145.550 MHz; the Shuttle also uses 259.7 and 296.8 MHz in the AM mode for navigation.

***Q.** Why is there an FM mode on many shortwave radios? Aren't all communications SSB, digital or AM? (R. Rogers, Vancouver, BC)*

A. Although we commonly think of the shortwave spectrum extending upwards to 30 MHz, in actual fact the FCC considers 25 MHz and above the beginning of the land mobile VHF spectrum. Narrowband FM is allowed and may occasionally be heard as studio-to-transmitter broadcast links, petroleum exploration transmissions and even hams above 29 MHz.

(Reader Rogers also asks if readers know where the first 60 Hz power generating station in North America was established. His answer: British Columbia! He says it still stands.)

In a previous column a reader asked why he couldn't measure the frequency of a Radio Shack garage door opener. A former Radio Shack technical employee called with the answer.

The remote openers operate in the 300 MHz range (specified for this purpose by the FCC) in a pulse mode; the 100 millisecond FM pulse is too short for most frequency counters to capture a reading.

***Q.** I need accessories and software for my old Bearcat CompuScan 2100; can any readers help? (Anthony Calogero, 16522 Winterleaf Drive, Ballwin, MO 63011-1878)*

A. The CompuScan was produced in small numbers just about the time Electra sold their Bearcat interest to Uniden. It utilized its own software protocol, so there were no compatible commercial products with which it would interface.

Can any of our readers help Anthony? Write directly to him.

***Q.** When scanning 851-868.9375 MHz, I hear a lot of private telephone calls. If this isn't cellular, what is it? (Paul Ebert, Oak Ridge, TN)*

A. Only cellular services (825-849, 869-894 MHz) are deleted from scanners as a result of lobbying by the well-financed cellular telephone industry. But there are many business radio services which are capable of tying into the phone lines.

***Q.** I would like to install a Beverage antenna, but don't have room for the recommended 750 feet of wire; could I compress it into about 75 feet by winding the wire spirally around a rope to suspend it? What would be the value of the terminating resistor? (Donald Barnes, Wheat Ridge, CO).*

A. You could, but it wouldn't be a Beverage which derives its performance from the extended length. You would simply have a helical horizontal antenna with some resonant frequency.

The terminating resistor for a Beverage is usually determined by experimentation, but is usually in the 200-500 ohm range.

U.S. Postal Service

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Rachel Baughn, Editor

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Club Circuit

Welcome to ...

The Worldwide TV-FM DX Association

The Worldwide TV-FM DX Association, which has been in existence since 1968, specializes in the VHF-UHF frequency spectrum: television, FM, and various public service and ham bands. The club's focus is on long-distance (skip) reception of the various modes as well as keeping up with station changes.

Most of the club's activity takes place within the pages of the *Vhf-Uhf Digest (VUD)*, its monthly publication. Here, loggings, tips, station changes, skip reports, equipment and TV test pattern pictures, and much more are shared among the members. An annual convention is held every summer for members to share experiences, and attend technical lectures and demonstrations of equipment.

Dues are $20 in the U.S., US$22 in Canada, or US$32 outside North America. WTFDA claims 400 members in about 25 countries, though most are from the U.S. To join, or to receive more information and a sample copy of the *VUD*, send $1 to Worldwide TV-FM DX Association, P.O. Box 514, Buffalo, NY 14205-0514 USA.

DX Clube Paulista

The DX Clube Paulista was founded in 1981 in Sao Carlos, a city of Sao Paulo, the most important Brazilian state. The club publishes *Actividade DX*, a monthly bulletin which supplies members with information about worldwide broadcasting. Its regular columns include: Logs (shortwave, mediumwave and FM); QSL Corner; QTH Brasil (Brazilian stations only); Onda Tropical; Radio Contato (members letters); Utilitarias (Utility DXing - logs and commentary).

Today the DX Clube Paulista is becoming increasingly popular as the only serious DX club in Brasil. In the past year it has increased from 40 to more than 80 members. There are currently only two foreign members (perhaps because the publication is in Portuguese). However, a sample bulletin can be had for 2 IRCs; a tri-monthly membership is 9 IRCs. Write to DX Clube Paulista, Marcelo Toniolo dos Anjos, Caixa Postal 3, Osasco/SP Brasil 06001-970.

Central Florida Listeners Group

This local club meets every other month in a variety of locations around the Altamonte Springs area of Florida. Its focus is "anything outside the ham bands"—LF/MF/HF/VHF/UHF Utility, Broadcast or Public Service!

Although the club does not presently have a publication, it does conduct a regular net on a 146.73 MHz 2-meter repeater, Sundays at 8 pm ET. Many non-ham monitors check in via a gateway by calling 1-407-273-5088 or via the Orlando Amateur Radio Club BBS (1-407-249-1071; attention "CFLG" on message board).

"We actively seek new members and promote amateur radio through our club as well," says David Grubbs. "We have gained many members from scanner buffs who monitor the CFLG net." CFLG was founded in late 1992, but with an average attendance of 22 at their bi-monthly meetings, the group has obviously generated a lot of enthusiasm. Check them out by writing Central Florida Listeners Group, David A. Grubbs N4EF, 956 Woodrose Court, Altamonte Springs, FL 32714-1261. Or call Andy Fountain at 407-273-5088.

Club Listings M-Z

Metro Radio System: Julian Olansky, P.O. Box 26, Newton Highlands, MA 02161, (617) 969-3000. New England states; Public Safety. *M.R.S. Newsletter.*

Michigan Area Radio Enthusiasts: Bob Walker, P.O. Box 81621, Rochester, MI 48308. Michigan & surrounding; All bands. *Great Lakes Monitor.*

Minnesota DX Club: Al Samson, 8367 Monroe St. NE, Spring Lake Park, MN 55432, 612-786-5915. Twin cities area; SW, MW, TV, FM, utilities. *MDXC Newsletter.*

MONIX (Cincinnati/Dayton Area Monitoring Exchange): Mark Meece, 7917 3rd St., West Chester, OH 45069-2212, (513)777-2909. Cincinnati/Dayton area; Full spectrum SW and scanning.

National Radio Club: Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711. Worldwide; AM/FM. *DX News* 30 times yearly, sample for a 29 cent stamp.

NYC Radio Fre(ak)Qs: Joe Alverson, 199 Barnard Ave., Staten Island, NY 10307, 718-317-5556. NY boros & LI; VHF/UHF/HF utilities.

North American SW Assoc.: Bob Brown, Executive Dir., 45 Wildflower Lane, Levittown, PA 19057. Worldwide; Shortwave broadcast only. *The Journal.*

North Central Texas SWL Club: Alton Coffey, 1830 Wildwood Drive, Grand Prairie, TX 75050. Central TX area; All bands.

Northeast Ohio SWL/DXers: Donald J. Weber, P.O. Box 652, Westlake, OH 44145-0652. NE Ohio; SWBC and utilities.

Northeast Scanner Club: Les Mattson, P.O. Box 62, Gibbstown, NJ 08027, (609) 423-1603 evenings. Maine thru Virginia; UHF/VHF, public safety, aircraft, military. *Northeast Scanning News (NESN).*

Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada, (416) 853-3169 voice & fax, (416) 444-3526 DX-Change information svce. Predominantly Province of Ontario; SWBC, utility, MW, FM-TV, scanning, technical, propagation. *DX Ontario.*

Pacific NW/BC DX Club: Phil Bytheway, 9705 Mary NW, Seattle, WA 98117, (206) 356-3927. WA, OR, ID, BC; DXing all bands.

Pakistan SW Listeners Club: Mrs. Fatima Naseem, Sultanpura, Sheikhupura , 39350Pakistan; Pakistan; SWBC.

Pitt Cty SW Listeners Club: L. Neal Sumrell, Rt. 1 Box 276, Sumrell Rd., Ayden, NC 28513-9715. Eastern NC; Shortwave bands. *The DX Listeners.*

Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749; Puna, HI; SW and MW.

QSL Club de France: Patrick Frigerio, 40 Rue de Haguenau, 67700 Saverne, France. All bands. *Courrier* (in French). 6 bulletins, 42 FF, EEC 12 IRCs, elsewhere 16 IRCs.

Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland; VHF/UHF/HF utilities. *Radio Monitors Newsletter of MD.*

RCMA (Radio Communications Monitoring Assn.): Carol Ruth, Gen'l Mgr., P.O. Box 542, Silverado, CA 92676. North America, Europe, Australia; All modes above 30 MHz. *RCMA Journal.*

Regional Communications Network (RCN): Bill Morris, Public Info. Officer, Box 83-M, Carlstadt, NJ 07072-0083. 50 mile radius of NY City; 2-way Radio Public safety notification group.

Rocky Mountain Monitoring Enthusiasts: James Richardson, 11391 Main Range Trail, Littleton, CO 80127, 303-933-2195. Regional Rocky Mtn area; scanner monitoring.

Rocky Mountain Radio Listeners: Wayne Heinen, 4131 S. Andes Way, Aurora, CO 80013-3831. Colorado Front Range; All bands. Annual meeting calendar for an SASE.

Southern California Area DXers (S.C.A.D.S.): Don R. Schmidt, 3809 Rose Ave., Long Beach, CA 90807-4334, (310) 424-4634. California area; AM, FM, TV, scanner and shortwave broadcasting.

Southern Cross DX Club Inc.: G.P.O. Box 1487, Adelaide, SA 5001, Australia. Australia, New Zealand, South Pacific; All bands. *DX Post.*

SPEEDX (Society to Preserve the Engrossing Enjoyment of DXing): Bob Thunberg, Business Mgr., P.O. Box 196, DuBois, PA 15801-0196. Worldwide; SWBC, utilities. *SPEEDX* monthly newsletter.

Susquehanna Cty Scanner Club: Alan D. Grick, P.O. Box 23, Prospect St., Montrose, PA 18801. PA area; Scanning all bands.

Toledo Area Radio Enthusiasts: Ernie Dellinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537. NW Ohio and SE Michigan; Shortwave, scanning, amateur.

Triangle Area Scanner/SW Listening Group: Curt Phillips, KD4YU, P.O. Box 28587, Raleigh, NC 27611. Central NC.

Wasatch Scanner Club: Jon Van Allen, 2872 West 7140 South, West Jordan, UT 84084. State of Utah. VHF/UHF. Newsletter/directory.

World DX Club: Arthur Ward, 17 Motspur Drive, Northampton, England NN2 6LY (in USA-Richard D'Angelo, 2216 Burkey Drive, Wyomissing, PA 19610). United Kingdom and worldwide. SW, MW broadcasting DX, FM & TV DX, amateur radio. *Contact.*

Worldwide TV/FM DXers Association (WTFDA): P.O. Box 514, Buffalo, NY 14205-0514. Worldwide membership; TV, FM, NWS.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Oct 2	**Boaz, AL**	Boaz Outlet Hamfest/Marshall County ARC/Hal Colfield, KK4OT, 110 Beason Lane, Albertville, AL 35950. Location: VFW Fairgrounds on Highway 431 North, 8am-3pm, talk-in on 147.07+.
Oct 2-3	**Va Beach, VA**	Virginia Beach Hamfest and Computer Fair Presented by Tidewater Radio Conventions/Manny Steiner, K4DOR 3512 Olympia Lane, Virginia Beach, VA 23452, (804) 340-6105. Location: Virginia Beach Pavilion. Saturday 9-5, Sunday 9-4. Tickets $5 in advance, $6 at the door. Talk-in on 146.97.
Oct 2-3	**Va Beach, VA**	Popular Communications Worldwide SWL Conference 76 North Broadway, Hicksville, NY 11801, (516) 681-2922. Location: Virginia Beach Pavilion, $25 registration. Hotel accommodations at the Radisson Hotel Virginia Beach, 1-800-333-3333.
Oct 3	**Springfield, OH**	Springfield Hamfest/Independent Radio Association P.O. Box 523, Springfield, OH 45501. Location: Clark County Fairgrounds, 8am-4pm, $5 admission. Talk-in on 145.450 and 224.26 MHz.
Oct 3	**Queens, NY**	Hall of Science ARC Hamfest/Arnie Schiffman, WB2YXB, (718) 343-0172. Location: New York Hall of Science parking lot. Opens at 9am. Admission by donation. Talk-in on 440.200.
Oct 8-9	**Augusta, GA**	ARC of Augusta Hamfest/P.O. Box 3072, Augusta, GA 30914. Location: Augusta College Sports Complex, $5 admission, talk-in on 144.89/145.49.
Oct 10	**Durham, CT**	ARRL Connecticut State Convention/Nutmeg Hamfest/Bob Schulte, WK1N, (203) 349-1373. Location: Durham Fairgrounds, Rt 17.
Oct 15-17	**Atlanta, GA**	1993 Monitoring Times Convention/P.O. Box 98, Brasstown, NC 28902. Location: Atlanta Airport Hilton. $50 registration for full weekend. $5 admission for exhibit room only. For more details see the ad on page 8.
Oct 16	**Starke, FL**	ARC-BA Hamfest/Bradford Area ARC/Tony Spatafore, WB2FGL, P.O. Box 852, Starke, FL 32091. Location: Bradford Co Fairgrounds, US301 North, $2 admission, talk-in on 145.15 or 146.52.
Oct 16-17	**Odessa, TX**	West Texas ARC Hamfest and Convention/Robert Jordan, N5RKN P.O. Box 7033, Odessa, TX 79760, (915) 335-7980 Location: Holiday Inn Convention Center, $8 admission, Saturday 8 am-6 pm, Sunday 8 am-2 pm.
Oct 17	**Kalamazoo, MI**	Kalamazoo Hamfest/SW Michigan Amateur Radio Team and Kalamazoo ARC/Gary Hazelton, KB8PL, 75075 M-40, Lawton, MI 49065. Location: Kalamazoo Central HS, $2 advance or $3 at the door; doors open at 8am. Talk-in on 147.040.
Oct 23-24	**W Palm Beach, FL**	Palm Beach County Hamfest/PBRA Hamfest, P.O. Box 461 Lake Worth, FL 33460. Location: Expo Center, So Florida Fair Grounds, Southern Blvd. Saturday 9 am-5 pm; Sunday 9 am-3 pm, admission $5. Talk-in on 147.165/147.765.
Oct 30	**Bowling Green, KY**	Franklin Fest '93/Southern Kentucky ARC, Ed Schwab, KA4REF P.O. Box 9656, Bowling Green, KY 42102, (502) 843-4389 Location: Wall Street, $4 admission, 8 am-2 pm, talk-in on 146.065/146.665.
Nov 5-7	**Houston, TX**	West Gulf Division ARRL Convention/Richard Shankle, N5KV 203 Arrow Wood, Lake Jackson, TX 77566.
Nov 6-7	**Lawrenceville, GA**	Alford Memorial ARC/P.O. Box 3100, Lithonia, GA 30058, (404) 985-8750. Location: Gwinnett County Fairgrounds, Saturday 9-5, Sunday 9-3:30
Nov 13	**Myrtle Beach, SC**	Myrtle Beach Hamfest/Grand Strand ARC, Web Williams, KD4CQK (803) 293-7888. Location: Myrtle Beach HS.
Nov 13	**West Monroe, LA**	Twin City Hams/Jimmy Ramsey, N5DMX 103 West Fairway Dr., West Monroe, LA 71291.
Nov 13-14	**Ft. Wayne, IN**	Indiana State ARRL Convention/Don Gagnon, WB8HQS P.O. Box 10342, Fort Wayne, IN 46851.
Nov 20-21	**Tampa, FL**	Suncoast ARC Convention/William Holcomb, KC4YTP P.O. Box 2423, Clearwater, FL 34617-2423, (813) 837-4533. Location: Florida State Fairgrounds

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

INDEX OF ADVERTISERS

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*. **Ad copy must be typed for legibility.**

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.

CB CHANNEL GUIDE UPPERS AND LOWERS. 32 pages what can be heard on 25-32 MHz. CIA, Army, CB, spies, etc. Also contains channel charts $5.95 plus $2 s/h: RSB, P.O. Box 3299, Morristown, TN 37815

NEW HT AND SCANNER STAND for handheld radios. Secures your radios to prevent accidental turnovers. Send $6.95 plus $2 s/h to: RSB, P.O. Box 3299, Morristown, TN 37815 or send SASE for more information.

SHERLOCK FREQUENCY FINDER software. Works with HB-232 Computer-To-Scanner Interface. New feature packed version now records audio. SASE for details. DataFile, Box 20111-MT, St. Louis, MO 63123.

TREASURE QUEST MAGAZINE The Journal of Lost Treasure, Shipwrecks and Recovery. Salvage, metal detecting, archaeology. Covers both land and sea treasure hunting. Hi-Tech search and recovery. Subscription, five issues, $16, 160 pages. Sample copy $4. Treasure Quest Magazine, P.O. Box 10030, McLean, VA 22102-8030.

GE SUPERADIO III, custom designed with noise-free SCA, $85. Professional SCA decoder card, excellent tone, $20. Performance guaranteed. (800) 944-0630.

RADIO CABINET SCREWS and MOUNTING SCREWS for PC board (Philips head 1-1/4" long) #2 and smaller. Call Bob Jr. at (410) 242-4282 after 4:00 or write to: Robert Covington, Jr., 1705 Selma Ave., Baltimore, MD 21227.

WANTED: REGENCY HX1000, HX1200, or HX1500 SCANNER. State condition and price. Bob Packer, 6505 S. Adams Ct., Littleton, CO 80121.

WANTED: Pocket AM radios, pre-1965, tube or transistor. Please provide model, condition and price. Mike, 2718 E. 10th St., Tucson, AZ 85716; (602) 325-3532.

CALLER ID DISPLAY — Radio Shack Duofone (Cat. #43-951). Like new, $40 includes shipping and insurance. Ira Paul, 21471 Ridgedale, Oak Park, MI 48237.

WATKINS-JOHNSON RS-160, 2-1000 MHz SCANNING RECEIVER SYSTEM complete with Scan/Pan display, frequency readout ($64K new) sell for $5K obo. WATKINS-JOHNSON WJ8617B 20-1100 MHz RECEIVER with signal monitor ($34K new) sell for $14K. WATKINS-JOHNSON WJ8718/MFP LF/HF RECEIVER ($12K new) sell for $4K. John (305) 749-1776 days; (305) 755-8725 nights. *Serious buyers only, please.*

GE SUPERADIO II with SCA, $50; COBRA 2000GTL SSB base, $350; MFJ VERSA TUNER II DELUXE, $75; ASTATIC GOLDEN DIAMOND EAGLE D104, $200. Other related gear, (407) 898-4152.

FOR SALE: BEARCAT 800XLT. Full 800MHz non-modified, used only one hour. First $175 pp. Other checks returned. Dan Crivello, 168 S. 84th Street, Milwaukee, WI 53214.

FOR SALE: KNIGHT FM RECEIVER MODEL KG 220 covers 30-50, excellent condition. Dick (607) 724-8153.

We've Moved Sale! LSCM2006 $459.95 while supplies last. Includes LED S Meter, 45CPS, Continuous 800, beep-volume/meter on-off control. Say you saw it in ***MT*** and receive another $10 off. Add a data/tone squelch for $39.95. Add 6000 channels with keyboard control for $249.95. Add the HB232 computer interface for $279.95. Add the Key Research PS-90 for $59.95. ***NEW—GE Trunking Systems Tones Override.*** Your scanner won't lock up on the five post tones when the radios unkey...$95.95. Send SASE for more info. LESCOMM, P.O. Box 81294, Corpus Christi, TX 78468-1294; ph. (512)985-2220.

DECODE CELLULAR DATA

The **Digital Data Interpreter (DDI)** will display cellsite data on a PC. See phone numbers, frequency changes and more from control and voice channels. The S/W allows selected data to be shown and it tunes somes radios. The **DDI** is an inexpensive diagnostic tool that can provide powerful diagnostic capability to your cellular test bench.

New deluxe model now available. Call or write for an order form and information on your radio. Most radios require an internal connection.

CCS — DDI
P.O. Box 11191, Milwaukee WI 53211
414-781-2794 ext. 20

Take a look at the
Ontario DX Association
We publish *DX Ontario*, an 80-page monthly magazine.
$2.00 for sample to MT Readers.
Call our DX-Change news service
(416)444-3526
or The Listening Post BBS
(905)841-6490.
Ontario DX Association
Box 161, Station A
Willowdale, Ontario M2N 5S8
Phone/Fax (905)853-3169.

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Reynoldsburg, OH 43068
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Largest selection of sconner frequency guides (federal, military, police, aero, etc.); AM/FM/TV broadcast directories; HF "ute" directories; Books on espionage, covert ops., bugging, wiretapping, surveillance, clandestine radio, & more! BIG FREE CATALOG!

CRB RESEARCH
P.O. Box 56-MT
Commack NY 11725

LETTERS cont'd

base stations. This particular conversation came in clearly from both mobile unit and the base, in the middle of a sunny afternoon."

Yep, such reception still happens. We received a clipping of a case last spring in which a woman from Eugene, Oregon, saved the life of a man who had driven off the road into a ravine. She received his transmission on her CB from Wyoming, over 1,000 miles away. But John Ward's reception more than doubles that distance!

Quickies

"I am secretary of the publication of International Listeners Organization in Pakistan. I am a 15-year-old student. Radio listening, penfriendship, stamp collecting, and reading are my hobbies. Please publish my address in *MT*."

Rashid M. Toor
St. College Wali, Home No. 221
Desehra Ground
Sheikhupura, Pakistan

"Three statements in the article 'New AMers Take to the Air' [8/93 p.6] did not make sense to me. Why 1605 to 1705? I thought AM broadcast stations were 10 kHz apart. What is the logic behind giving a city with no full time station another daytime only station? How does a station transmitting 1 kW automatically start transmitting 10 kW?"

Philip Epstein, Minneapolis, MN

Read past months of the 'American Bandscan' column which has been following expansion band developments. Editor Karl Zuk says the expansion has been "imminent" since 1990 and has been a case of "hurry up and wait," so don't expect too much in spite of the hype.

The actual broadcast band is 535 - 1605 (not 540 to 1600 as shown on your dial), so that's why the expansion is listed as 1605-1705. All the new assignments are for full time stations, says Karl. And how does a 1 kilowatter suddenly become a 10 kilowatter? It buys a new transmitter, of course! Stay tuned ...

"Your September issue, in 'Outer Limits,' indicates that Radio Liberty is operating on FM in Brazzaville, Zaire. Brazzaville is still located, to my knowledge, in the former French Congo, across the river from Zaire, by my maps. Nice job you are doing despite the occasional slips."

Frank Tamas, Madison, WI

"With regard to Radio ROMing, note Walnut Creek's new QRZ CD-ROM (1547 Palos Verdes Mall, Suite 260, Walnut Creek, CA 94596; 800-786-9907) [*We did; see p.92, 9/93*]. You can get most CD-ROMs well below list, especially after they've been out a while, from third parties. For example, last Saturday at a swap meet at the Cow Palace in Daly City, CA, Free Spirit S/W (109 W. Pearl, Trafalgar, IN 46181; 800-638-5757) had AMSOFT Vol. 2 for $29 [*See p.98, 8/93 for review*].

Joel Rubin, San Francisco, CA

Editor's Notes

• Last month a reader recommended Harding Energy Systems as a supplier of NiHy rechargeable batteries. Several readers have discovered that the phone number given is no longer valid, however. You can contact Harding in Grand Haven, Michigan, at 616-798-7033; 7044 FAX.

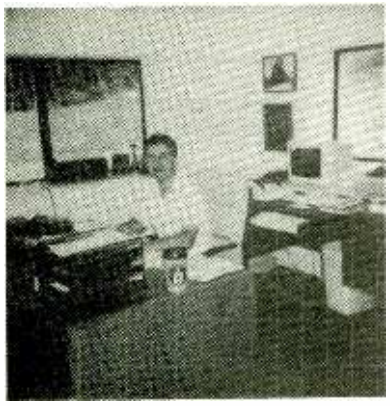
• Are you a reader planning to attend the Wireless Symposium and Exhibition, January 12-15 in San Jose? If you are and you might be interested in providing pictures or other report, I'd like to hear from you.

Here's hoping all your monitoring times are good ones,

Rachel Baughn,
Editor

Closing Comments

We're In Our New Home!



As of August 23rd, *Monitoring Times* and the entire Grove Enterprises organization moved to our brand new headquarters. We're still in Brasstown, just five miles from our previous home on Dog Branch, and our Post Office address (Box 98) and telephone numbers remain the same. But our spacious new building offers 6000 square feet of office space, overlooking a pristine mountain valley.

MT staffers Rachel and Beverly have noted how our consolidated headquarters (we were previously in two separate buildings) streamlines the operation and has drawn our "family" back together. They also appreciate the improved lighting, much brighter than in the old converted residence.

We have installed three antenna masts on the roof of our 125 foot metal building; the center mast is a vertical antenna, making the building one heck of a ground plane! You can imagine how that improves reception (and transmission from our new ham station).

Larry, for whom we had no desk when he moved to Brasstown from New Orleans, is reveling in his new office. Right now, in my office, I'm looking out into the dense woods, admiring the placid beauty of our natural surroundings.

Particularly spacious are our shipping/receiving and engineering/manufacturing areas. We expect to offer considerably more equipment in the Grove catalog in coming months as exciting new products are under development.

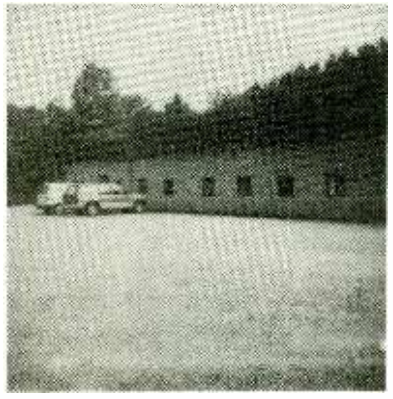
Finally, the eighteen-wheelers can drive in and turn around without the drivers cursing (which they do very well), and our staff members have ample parking space where they can open their car doors without chipping eath others' paint (and cursing like the truck drivers)!

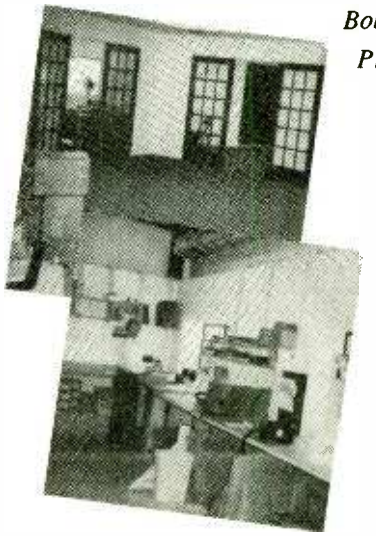
This new facility represents a milestone in our growth. While the general economy is sluggish, to say the least, our sales and subscriptions have never been better. More and more dealers are carrying *Monitoring Times*, and our new Grove products — the SDU-100 spectrum display unit and CVR-4 military aircraft Scanverter — are catching on fast.

For the reader of *MT*, we hope our renewed enthusiasm generated by our new headquarters will be reflected in our writing, noted for its timeliness, accuracy and originality.

A videotape of our new headquarters will be showing at the *MT* convention in October. We hope we'll see you there, but if not, drop us a line; we always enjoy hearing from you.

Bob Grove
Publisher





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- Fully modular design, featuring plug-in circuit boards and high-quality surface-mount components. No other manufacturer can offer such professional-quality design and construction at so affordable a price.

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