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Monitoring Times

A Publication of
Grove Enterprises, Inc.

1993 Index to Monitoring Times

New SW receiver makes its debut at the 4th MT Convention

Backstage At Your Local Live Shot

- Inside NOAA Weather Radio
- **Arthur Cushen:** Blind Broadcaster and DX Pioneer

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December 1993

Monitoring Times

Arthur Cushen: Blind Broadcaster

What you as a radio listener do as a hobby, Arthur Cushen does as a career and as his way of keeping in touch with the world. Most of us would be satisfied to be half as prolific in our jobs as Cushen, who monitors signal reception for at least four stations, and produces written, audio and braille reports about radio listening for several magazines, hobby publications and radio programs. Here is the life of this extraordinary DXer.

Backstage at Your Local Live Shot

By Bennet J. Liles and Brian Cathcart

Two members of the broadcast industry let us in on the procedure and the jargon of television on-site reporting. You with your scanner can follow along as the shot is set up, the reporter is cued, and the transmission begins on your television screen. We also have some clues for picking up satellite feeds for those of you with a dish.

Inside NOAA Weather Radio

By Ken Reitz

An interest in the weather may be the most universal experience shared by humankind: New technology just gives us fancier gadgets for measurements and predictions. Weather information is broadcast over almost 400 NOAA weather radio stations, but one can also find weather data on the ham bands, on satellites and on shortwave. But beware: Like radio, your involvement in the weather hobby can go as deep as your pockets and your time will allow.

COVER PHOTO: *WPTV's Unit 508 ENG (Electronic News Gathering) Live Truck. Behind it is an 11-meter Ku band satellite dish for NBC news feeds. Courtesy WPTV and Brian Cathcart.*

The Annual Monitoring Times Convention 28

There's no way one can sum up the true flavor of any convention, but we hope this mostly pictorial report will communicate some of the highlights. "A good time was had by all" and, yes, "we wish you were there!"

The 1993 Monitoring Times Index 31

And More ...

"Beginner's Corner" asks, "Are We Having Fun Yet?" reminding us not to forget *this is a hobby* and it's supposed to provide relaxation. For example, stop and listen to the programming occasionally instead of chasing DX. Have you heard a good book lately? One place to start could be by tuning in programs reading or talking about books, which is the feature in this month's "Program Spotlight."

If you're hoping to introduce someone to the joys of shortwave broadcast listening, and looking for a receiver that will neither break your budget nor chase them away with bad selectivity, inaccurate tuning, and tinny audio, read "Magne Tests." The Sony SW-30 may be a winner for the beginner, and for the traveler, too.

A couple of projects for stay-at-home winter months include a preamp ("Experimenter's Workshop"), tuning dial and homemade speaker enclosure ("DeMaw's Workbench") and longwire receiving antenna ("Antenna Topics"). Reviews of commercial antennas that won't have you climbing around on a snowy roof include the Funtenna by ComRad, and the White Box antenna by Palomar.

"Utility World" recaps the drastic cutbacks in the use of Morse code in 1993, and makes a prediction of CW's impending demise. Uh-oh, tune up that code key and sharpen your pencil...this subject's hot!

Hot or not, you'll find something to interest, teach and put to use in this and every issue of *Monitoring Times*. Happy Holidays!

DEPARTMENTS

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LETTERS

As the year winds down, we have to admit 1993 has been a good year for Grove Enterprises and *Monitoring Times*. It has been a stressful one in many ways, but now in December we are settled into new quarters and new routines with even higher productivity.

It is my sincere hope that the past year has been a growing one for you, too. If that growth has been painful at times, I hope that occasionally you could turn to the radio hobby for a few pleasurable hours and that it increased your appreciation and understanding of others in our world. Radio has saved many lives this year, without doubt, as it has also cheered the sick and the lonely, entertained the young and the old, and sparked the imaginations of all its listeners.

The Scannist as Watchdog?

Barnaby J. O'Leary of San Francisco, CA, sends a newsclipping about a man who shot himself and his two young children after a nine-hour standoff with police. Frustrated with police accounts of the incident, a citizen who had recorded the police communications released the recording to the *Antioch Daily Ledger Post Dispatch*. The tape implies that the man was given a ten-minute ultimatum, which some contend may have triggered his decision to shoot himself and his children. Police had not previously reported a ten-minute deadline being given.

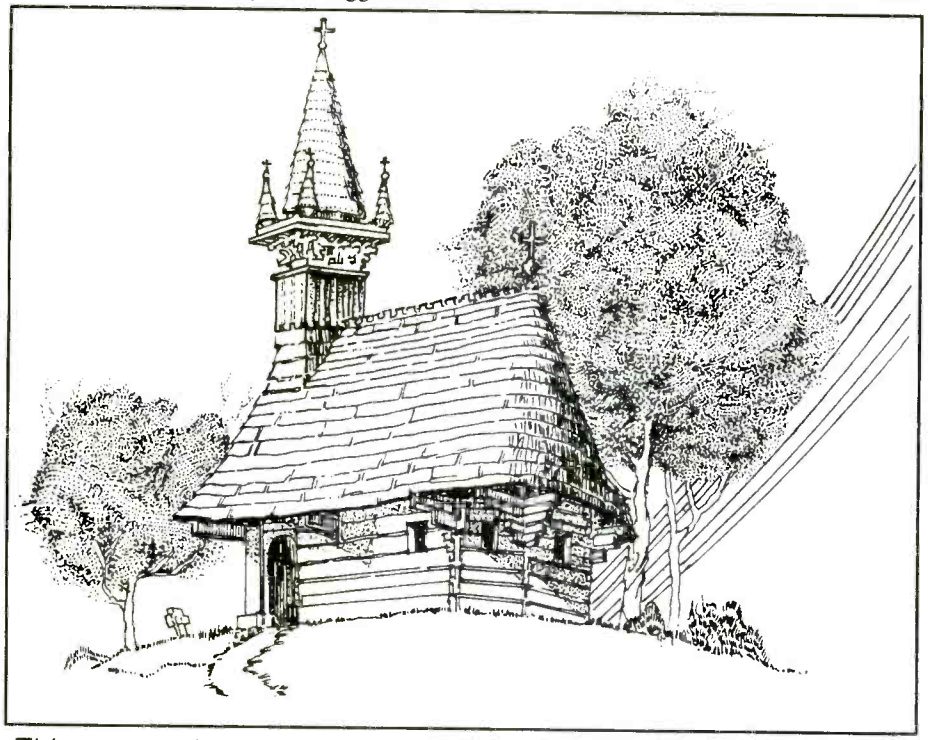
In this conflict between scanner enthusiasts and police, Barnaby says several questions are raised:

- Why did the police give a 10-minute ultimatum; why did they deny it; and why did they delete that reference from their tape?
- What treatment would any known scanner enthusiast expect from the Antioch police department?
- While the scanning enthusiast did cross the line by sharing, was the public's right to know (sufficient) justification?

Any time, of course, that a radio listener comes across evidence of illegal activity or activities contrary to the public interest, he or she is faced with a difficult decision. Should he share the communication, even though it is proscribed by the Communications Act of 1934? If so, to whom should the information be given: the police, the press, the political opponent, etc.? The possible personal consequences of revealing the communications must be weighed against the consequences to the public of not revealing them. It comes down to a case-by-case basis. What do you think?

Too Easy Two Meters

A couple of months ago we mentioned in passing the popularity of two meter hand-held



This pen and ink drawing by Helen Wilkerson of Greenville, SC, was based upon a greeting card sent to her by Radio Romania.

LETTERS

transceivers with New York City gangs. Bob Valen of Lumberton, TX, now sends a copy of Chapter One, "Two-Way Radios" from the book *Hard-Core Poaching* by Ragnar Benson. This chapter sings the praises of amateur radio two-meter radios over Citizens Band radios for coordinating out-of-season wildlife hunting.

Valen says, "The fact that Mr. Benson can purchase 2 meter radios without an Amateur Radio License is much like the heated issue of gun control—ease of availability in today's market place. Any citizen or criminal can get one because there are ways of getting around any imposed requirements.

"The weaknesses evident in the sale of amateur radio equipment shows a gross lack of self-enforcement by the industry. The simple act of a mail order purchase has some real problems. Mr. Benson purchased 2 meter rigs without having to give and verify a call sign or provide an amateur radio license."

Here's a quote from *Hard Core Poaching*: "Orders placed with a mail-order firm generally generate the fewest number of questions. There are dozens of call signs printed in magazines. It isn't particularly difficult or risky to appropriate one. Locally, have a wife or girlfriend pick up the units. She can pay in cash and claim complete ignorance, cutting any ties to you once she walks out the door."

Valen admits, "Many of us realize there are more pressing issues in our society today. Yet, I see this issue as one that can be corrected by those of us in the hobby or industry. Certainly, radio retailers can sharpen up a bit and be more vigilant when involved in the mail order business. Monitors also can be more vigilant of radio activities like those of Mr. Benson (wildlife poaching) and report them to the local authorities."

Thanks for the input, Bob, and thanks for your well-wishes and kind words for the magazine. Concerning asking retailers to regulate the sale of amateur transceivers, however, anyone can legally OWN amateur equipment; they just can't transmit without a license. There is no justification for a seller to even inquire about the purchaser's license, other than for their own information.

Why Reinvent the Clock?

"In the September issue of *Monitoring Times*," begins Gene Carr of Lawrence, Kansas, "you published an item headed, 'Why spend money on someone else's customized 24-hr clock ...' followed by instructions where to buy and assemble parts for same. This is okay for tinkerers; I hope I have an easier solution.

"I bought a 7-1/2 inch, big numeral, battery-operated, crystal-controlled, sweep second hand clock at WalMart for $5. I added 24-hour stick-on numerals that come inside every VHS videocassette package. A stationery store made a UTC sign to go under the clock for $3.50. I'm enclosing a snapshot of the finished product. Thanks for *MT*'s continuing excellence."

In-Flight Electronics

An attendee at the *MT* convention (I'm sorry, I don't remember who) handed me a very informative chart from the *New York Times* which listed what electronic devices are allowed on which airlines. The break-down is shown in the chart above.

Airline	Banned During Takeoff and Landing	Banned at All Times
American	conventional electronic devices, electric shavers, CD players	AM-FM radios or VHF radios, cellular phones, cordless computer mouse, remote-controlled toys, TVs
Continental	conventional electronic devices, CD players	AM-FM radios, CB radios, cellular phones, any radio transmitter-receiver remote-controlled toys, TVs
Delta	conventional electronic devices, CD players	AM-FM radios, cellular phones peripheral computer devices (mouses, printers), radio transmitters, remote-controlled toys, TVs, VHF scanners
Northwest	conventional electronic devices, CD players	AM-FM radios, cellular phones, any device that emits radio waves, TVs
TWA	conventional electronic devices, CD players	AM-FM radios, cellular phones, remote-controlled toys, TVs, walkie-talkies
United	conventional electronic devices, CD players	AM-FM radios, cellular phones, remote-controlled toys
USAir	AM-FM radios, conventional electronic devices, TVs	cellular phones, CB radios, CD players laptop computers with antenna, remote-controlled toys

New York Times

Selected Shorts

• "The U.S. Navy Cruiser Sailors Association is now actively seeking new members to swell our ranks. Membership is open to all ship's company, marine detachment, aviation division personnel and flag members that served or are serving aboard cruisers. Associate memberships are available for past and present Navy men and women, reservists, widows of cruiser men and interested individuals.

"For information contact: Ronald J. Maciejowski, Secretary, USNCSA; 55 Donna Terrace; Taunton, MA 02780 (USS Worcester CL-144).

• "This is just to thank you for the October *MT* story on WEWN. It surprised me, actually, since normally their efforts are passed over as just another religious station. This will help lessen my dependence on cable TV and more on SW radio."

John Schubert

(One of several letters expressing appreciation for the WEWN profile by J.D. Stephens)

• "In the May issue there was mention of Radio Caroline in the 'Outer Limits' column. My son D.L. Bogart was on the last trip of Radio Laser and knew the Caroline crew. So he used the address given to contact them and got a quick return. They were wanting to know what had happened to the Laser D.J.s.

"New radios and their parts are much different from the ones we had in radio supply in the Radio Repair School at Fort Gordon in 1952. I went from there to Korea to be in a Q.M. Laundry Co.

"Happy to see you in your new home. We sure enjoy your magazine very much and read every bit of it. There is no stopping your growth now."

Harley Bogart, Jr.
Aurora, MO

Continued on p. 119

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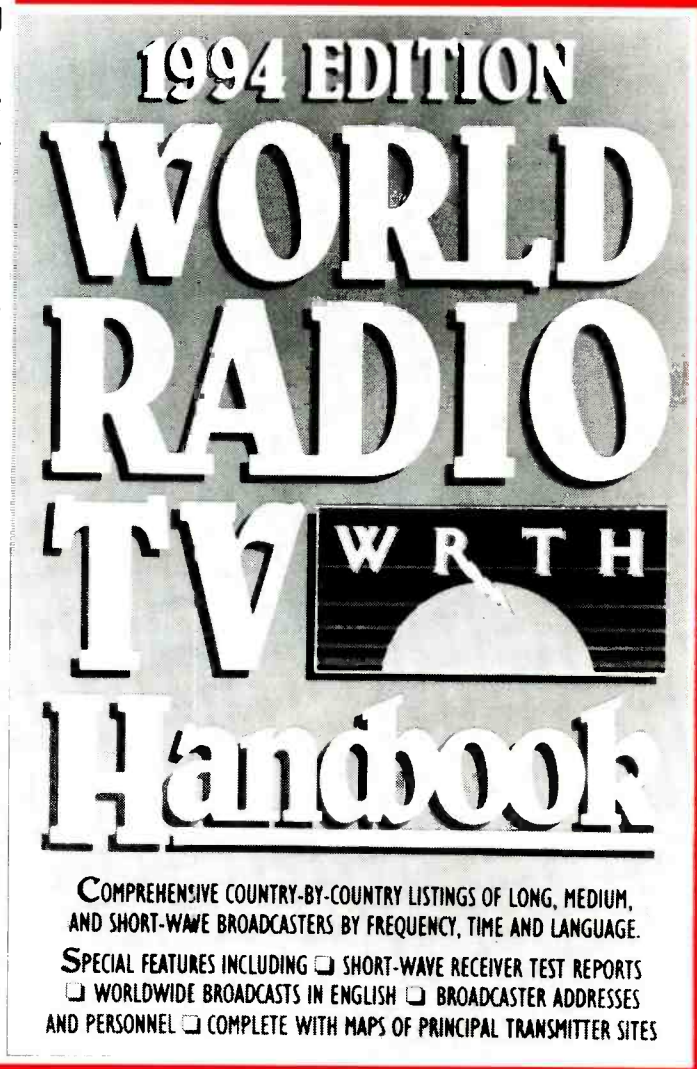

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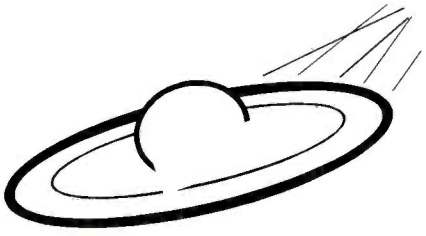
COMMUNICATIONS

FCC Invalidates Local Mobile Ban

The FCC has decided to overrule certain state and local ordinances that prohibit amateur radio transceivers when the laws are based on incidental reception.

The ruling affects hams whose transceivers are outlawed because they can, along with ham frequencies, also receive public safety, special emergency, or other radio service frequencies.

The ARRL asked the FCC to preempt the law because amateur operators have "special needs for out-of-band reception." The FCC concurred saying that laws banning the use of ham transceivers "are inconsistent weith federal objective of facilitating and promoting amateur radio service."



UFOs Can Sting!

It appears to be illegal to listen in on police frequencies in England. But how in the world would the authorities know if you were monitoring?

According to *Law and Order* magazine, police in Appleton, Cheshire, came up with a transmission that was designed to shock. An all points bulletin went out, advising that a flying saucer had crashed and burned. Five civilians who hurried to the scene were arrested and charged with illegally monitoring police communications.

Flying High

A mysterious voice known as the "Roanoke Phantom" has been causing problems at the Roanoke Regional airport. Using an aviation transmitter mounted in a car, the prankster would issue official-sounding instructions to pilots, ordering them to break off landings at the last minute or to change altitudes. On other occasions, the voice has issued false "maydays," claiming to be the victim of a crash.

Originally, the hoaxster would simply chat with the air crews, inviting them to smoke marijuana with him after they landed.

Seven weeks after it all started, Rodney Bocook was arrested and charged with communicating false information, endangering the safety of aircraft in flight, and using obscene language on the radio. If convicted on all counts, Bocook faces a maximum penalty of 22 years in jail and a fine of $500,000. Bocook's attorney immediately asked that his client receive a psychiatric evaluation.

More Cash and Carry Ether

It used to be that only the rich could afford to go on shortwave. Now it seems as if anyone with a few dollars can get worldwide attention. Add to the growing list of stations taking on paid programs is Radiocentras, a commercial station in Vilnius, Lithuania. Says a station official, "our 5 kW transmitter may be rented to any broadcaster, private, commercial, religious, public, state, utility services, DX clubs, etc."

There's no word on how much Radiocentras is charging. You can, however, get the specifics from P.O. Box 1792, Vilnius, Lithuania. Radiocentras uses lower sideband on 9400 kHz.

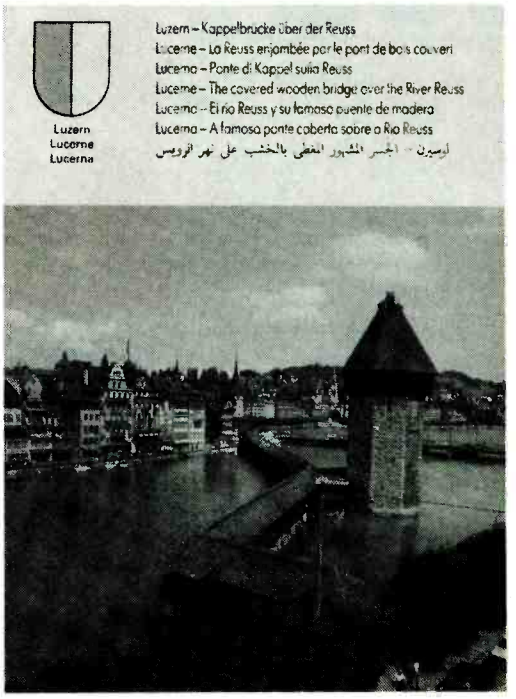
Having a Blast

It was quite a party at Bosnian Radio Mostar, celebrating its first anniversary some weeks back. The party was short-lived, however, when some 200 pound guests arrived unexpectedly. The special anniversary broadcast was greeted by several shells which fell on the city's central district.

The HVO (Bosnian Croat militia) proclaimed Bosnian Radio Mostar "to be it's radio station" last year.

Why Not a Snowman?

When Katherine Klein and Randy Baca-Hensel decided to put the tower for their radio station, KXLL 105.9 FM, on Mummy Mountain, they didn't want to "soil" Paradise Valley, Arizona, with a standard radio tower. So the two have decided on an environmentally sensitive solution — disguising the tower as a giant saguaro cactus. "I have a real innate sensitivity for those mountains," said Baca-Hensel.



SRI is for the Birds

Swiss Radio International says that it is looking to the skies. "We're changing... for the better!" said one recent announcement. "SRI has decided to give even more attention to the broadcasting vehicle known as a satellite. For you, that means perfect reception of programs that deserve to be heard under the best possible conditions."

SRI was quck to point out that it was not abandoning shortwave. "We're not about to pull out everything by the roots." The new satellite broadcasts are scheduled to begin in April of next year.

Many Broadcasters

There are 11,484 licensed broadcast stations in the United States. This includes 4,951 AM, 4,903 FM commercial and 1,630 FM education stations.

UN Radio

UN Radio By Phone

UN Radio has opened an electronic bulletin board. By dialing 212-963-3777, you can choose English or Spanish, then hear a daily

COMMUNICATIONS

briefing, daily news, news from UN Peacekeeping Operations, or "The World in Review. "All you need is a touch-tone phone. This is not a computer bulletin board. A special instruction sheet is available by fax by calling 212-963-6982.

Closing the Big Ear

It was the largest employer in Fauquier County, Virginia, with a payroll of $85 million. Housed within a 700-acre base bounded by barbed wire fences, is a facility once known as "Washington's Big Ear" and for over half a decade, it has been vital to U.S. national security.

Vint Hill Farms opened on June 12, 1942, intercepting key communications during World War II, later training its antennas on Washington's Embassy Row, and more recently, producing new intelligence technology.

But despite several celebrated successes, Vint Hill did not suvive the conclusion of the Cold War, ending up on the list of base closings. It is scheduled for closing in 1988. The Pentagon said that it was "low in military value."

Some others disagree. According to Rep. Frank Wolf, Vint hill succumbed because its job is so sensitive. "Even for [base closure commission chairman] Jim Coulter to find out [what was going on at Vint Hill] he had to have top-secret clearance.

Others [on the commission] weren't eligible." "There's one function out there that you can't even breathe about," says Wolf. "Nobody on the base closing commision knew about it." Col. Mark Cornwell, who took command of the base two days before it was scheduled to close, said, "Of course, Vint Hill has a history of popping on and popping off base closure lists in the past."

Unless something changes in the near future, one military intelligence batallion will move to Fort Gordon, Georgia, next year. Other units will transfer to Fort Monmouth, New Jersey, in '95 and '96.

FCC Fights Pirate Epidemic

Radio Free Berkeley broadcaster Stephen Dunifer may be free, but this pirate broadcaster, who speaks on behalf of the public's right to broadcast even if it can't afford to buy a station, will still find broadcasting to be expensive if the FCC finds a way to collect its $20,000 fine.

Dunifer is only one of several low-power, fly-by-night broadcasters in the area. Another operation is called San Francisco Liberation Radio, for which Richard Edmondson was recently stopped—by eight police cars and nearly 20 San Francisco Police!

"The FCC didn't make it clear to the police why they wanted me stopped, and the police thought they were pursuing some dangerous criminal when they pulled me over," said Edmondson. The FCC may decide to fine him $20,000 as well. Although Edmondson has not admitted any connection to San Francisco Liberation Radio, Philip Kane, engineer in charge, says "We have conclusive evidence."

Meanwhile, Stephen Dunifer says he has plans for a shortwave pirate operation to give him a global audience.

Peace at Last

Perhaps the world's most famous pirate broadcaster shut down the transmitters for the last time this past October, saying his work was done. For 20 years Abie Nathan broadcast his message of reconciliation from the good-ship *Peace* "somewhere in the Mediterranean."

Nathan, who was born in Iran and trained in the Indian Air Force, was a captain in the Israeli air force from 1948 until 1951. However, disturbed by the hate and venom he heard from both Egyptian and Israeli radio stations, he decided to start an independent station broadcasting a message of peace. The program format was Top-40 music interspersed with his message of "no more war, no more bloodshed."

The ship, which Nathan initially planned to sink after his final broadcast, will be preserved as a peace monument. It could also be considered a monument to the power of radio. Abie Nathan felt that the 1967 Arab-Israeli war could have been avoided if there had been better communication. In this season especially, we salute the efforts of Abie Nathan and all other broadcasters seeking to improve "Communications." Peace and good will toward all.

Communications is written by Larry Miller from a variety of sources, including material submitted by the following Communications staff reporters: Dave Alpert, New York, NY; Paul Casey, Ottawa, Ontario; J. Harold Eads, Fincastle, VA; Curt Elsbernd, San Mateo, CA; Robert Finn, Destination Unknown; Henry McGann, Triangle, VA; Jim Rindfleisch, Newport News, VA; Barbara Sue-Ting-Len, Union Nations, New York; R. W. Van Hengel, MI; Thom Wendling, Sanibel, FL; Bob Woods, Martinsville, VA; and Paul Wright, Deming, NM. A special commendation goes to our Virginia bureau for an excellent job of reporting on the Roanoke Phantom. Additionally, we obtained information from *BBC Summary of World Broadcasts, National Scanning Report, Radio World* and *W5YI Report*. Thanks to all. MT

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TC200 Tone Counter (CTCSS signalling tones)	$ 179.
APS-104 (Extends RF detection distance 10x)	$ 995.
CF800 Cellular Band Pass Filter/Amplifier	$ 299.

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ARTHUR CUSHEN

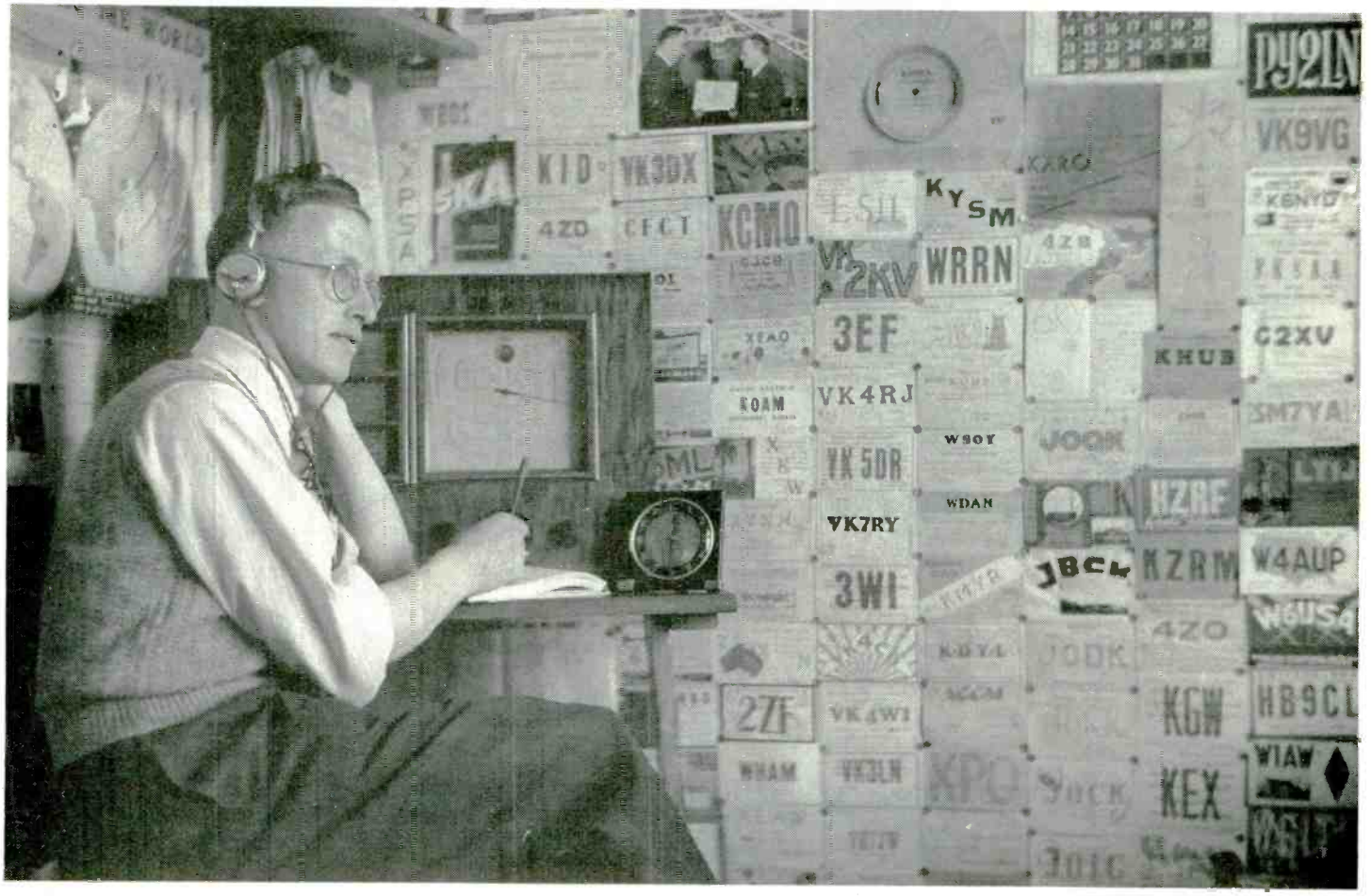
Blind Broadcaster and DX Pioneer

Over the past 33 years the voice of Arthur Cushen in Invercargill, New Zealand, has been heard across the shortwave bands. His braille script and his contribution to the programs of Radio New Zealand International and Radio Nederland are known to thousands of listeners. However, many newcomers to the hobby of shortwave listening may not fully appreciate the value of the service he provided to international broadcasters and the groundbreaking contributions he made to the radio listening hobby. So we asked him to tell us how it was. Here, then, is "Arthur Cushen on Arthur Cushen."

Putting DX in Print

It was back in 1932 that Arthur Cushen, at that time suffering from very poor sight, heard a broadcast that gave him a new outlook on life. He listened at 3am on December 26 to the first Christmas broadcast of King George V, never realizing that some 40 years later he would meet the Queen's granddaughter, Her Majesty Queen Elizabeth II, during the personal presentation of an award for his services to radio listening and the blind community.

The excitement of hearing overseas voices prompted him to join the New Zealand DX Club and by 1940 he had verified all the mediumwave stations in Australia and New Zealand and many shortwave stations. In September 1939, he began contributing a page on shortwave list-



Listening on an English Ekco 7 tube in 1942 before I was married. This was my only receiver from 1939 to 1954.

ening, which some 54 years later is still a feature of the *New Zealand DX Times*, the magazine of the New Zealand Radio DX League (successor to the DX Club).

Arthur was unable to serve during the war, so he worked for the Security Intelligence Service. He, along with other members of the DX Club, passed on some 6000 prisoner of war messages to New Zealanders and many next of kin overseas. He was already publishing small radio logs, but in February 1942 he received a letter from the BBC asking him to monitor their signals broadcast to the Pacific. Thus commenced some 51 years of working for the BBC. As it was wartime, he was also given the opportunity of sending the information by international telegram, collect, and over 1000 telegrams were sent to the BBC during the 1940's.

When Radio Canada International, the shortwave service of the CBC, was created in 1945, one of the BBC engineers employed in the installation and operation asked Arthur Cushen to become their monitor in the South Pacific. Today, he continues to send his weekly reports to Montreal.

In addition, each month he is assigned a shortwave band to survey by RCI. All the transmitters using that frequency range are logged, indicating the length of transmission, the signal level and the location of the broadcaster. This layout is similar to the computerized information in *Passport to World Band Radio*.

The signals from RCI are monitored in a total of 56 frequency checks made daily five days a week. Local listening time is 8:30am-noon and 4-6pm, while for the BBC the monitoring is from 6am-noon and 6pm-11:30pm.

In 1972 the VOA approached the BBC with the suggestion that Arthur might monitor their signals as well, so Cushen began sending reports to Washington. Now, VOA monitoring reports are put on to a special form in which the frequen-

Recording a broadcast for Radio New Zealand for a Braille Script at the Studios in Invercargill, New Zealand.

Judith Russell and Arthur Cushen in the RNZ office. Note that files are identified in both print and braille.

cies and times are indicated by filling in the appropriate numbers. This takes about 40 minutes to prepare as there are up to 64 observations a day! However, the system allows the VOA to feed the information into a machine which optically reads the material and transfers it to the computer.

As one would expect, visitors from these three organizations have made the trek to Invercargill over the years. Likewise, Arthur and Ralda Cushen have visited Montreal and London and spent considerable time at these broadcasting organizations talking with the staff on the problems of reception in the South Pacific.

In 1950 Cushen began a highly successful feature column called "Shortwave" in the *New Zealand Listener*, which is now the radio and television program publication of Radio New Zealand and Television New Zealand. It brought in hundreds of letters each year and was only discontinued in 1988 when a new Editor of the *Listener* wanted to give it a new look. This, to some degree, was because a new competitor, *TV Guide*, had appeared on the book stands.

In 1952 Arthur Cushen took over a column from Ray Simpson in *Radio & Hobbies* magazine published in Sydney. This magazine feature is called today "Electronics Australia." Arthur has recently celebrated his 40th year with this publication, which he commemorated in the July issue. In 1957 the local newspaper, the *Southland Daily News*, asked Arthur to write a radio column, because a few months earlier, the city's first commercial radio station had commenced to operate and there was intense competition for the advertiser's dollar. Under the heading "On The Beam," this feature is still published today in the *Southland Times* which bought out the *Southland Daily News* in 1968.

Two books have been written by Arthur Cushen. *The World In My Ears* was published in 1979. There were buyers in over 70 countries, but Gilfer Shortwave was the largest dealer. Long sold out and off the market, there are still requests today for this publication, but the copyright was given away so that it could be produced in braille in many countries, including The Library of Congress. At the same time, a talking book version was released in New Zealand, Australia, Canada, United States, United Kingdom, Germany and the USSR.

In response to letters wanting a publication about listening in the South Pacific, Arthur Cushen's *Radio Listener's Guide* appeared on the book stands in 1988. This was a completely home produced publication: Ralda Cushen designed the cover, Pauline Winter and Judith Russell, two of the staff in the office who have been working on many projects for the past 14 years, did the research and typing. The soft cover book sold out quickly. In 1990, a second edition was published, completely revised and containing "Secrets Of Wartime Listening To The Enemy," concerning Arthur's work for the Security Intelligence Service.

Broadcasting

In 1959 Cleve Costello of Wellington commenced a program called *This Radio Age* on Radio New Zealand's shortwave service; Arthur Cushen joined the program in 1960 to provide DX information. Soon after the program began, a 15-minute DX Program was begun on the old 7-1/2 kW transmitters of Radio New Zealand and its popularity was such that it was also carried on the National Program of Radio New Zealand. Retitled, "Arthur Cushen's DX World," it continued until the opening on 24 January 1990 of the 100kW transmitter. Radio New Zealand International, (renamed because Radio New Zealand was been taken over by the medium wave network) then picked up the DX program as part of Tony King's *Mailbox*. It is produced fortnightly, and is broadcast three times each week.

In 1965 Radio Nederlands' popular "DX Jukebox" with Harry Van Gelder was receiving requests for information about listening in the Pacific. Because the Radio New Zealand signal seldom reached Europe, they negotiated with the New Zealand Broadcasting Corporation to allow Arthur Cushen to broadcast from Hilversum. The arrangement, still in effect today, calls for Arthur Cushen's fortnightly programs to be recorded by 4ZA, the local commercial station, to be aired by Radio Nederland on the first Thursday of each month.

At first, the procedure created problems in maintaining its topicality. After the session was recorded in Invercargill, it was airmailed to Holland, where the program was put together and then airmailed to Bonaire—making it over a month from the time of preparing the material until it was finally broadcast.

All that has completely changed in the past few years. Both programs are now prepared

Presentation of the commemorative stamp award at the ANARC Convention, Montreal 1986. L to r: Ian McFarland, Arthur and Ralda Cushen.

independently; Tony King phones for RNZI on a Friday, and he and Arthur talk about the news on shortwave and record the feature, while on Monday evenings at 6:15 pm Jonathon Marks phones from Holland and he and Arthur put together the program for the following Thursday. Mr. Cushen always writes in advance to both broadcasters with an idea of what he will be featuring so that it becomes a more chatty type of presentation.

Today, the broadcasts are carried in 12 transmissions from these two stations. Radio Nederland broadcasts, of course, are also relayed, not only using the facilities at Flevoland in Holland, but from Bonaire in the Caribbean, Madagascar off the coast of Africa and since February, the transmitters of the former Soviet Union at Alma Ata and Irkutsk.

The accompanying braille transmission is not a full text. Mr. Cushen relies very much on ad lib and lists mainly the time and schedule in his braille material and chats about the information more fully, which he feels is a more friendly way of broadcasting. Generally, two inserts of interesting stations of the month are provided for *Media Network*; sometimes these are sent ahead on cassette and other times they are sent over the telephone.

Radio Listening

Of course, the basis for Arthur Cushen's whole livelihood is the radio. He has had to train himself to use his ears as he has no sight and, of course, listening around the dial one gets a very acute knowledge of times, frequencies and the propagation conditions. He started listening on a Stewart Warner in 1932. The first receiver he bought was an English Ekco 7-tube made by E.K. Cole in the United Kingdom which he used from 1939 until 1954. Other receivers have come and gone since then, including Hallicrafters, National, Eddystone and the present equipment.

The invention of the Sony keypad receiver in 1980 was the greatest help to Arthur's independence. Before that, using receivers with an

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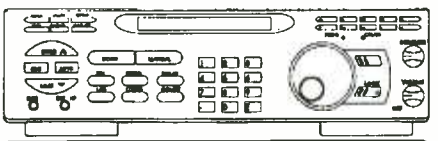

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Arthur and Ralda Cushen being interviewed by Henry Hatch of the World Radio Club programme when they visited the BBC Studios in London 1969.

analog dial, he used to use the local stations as a pointer to take him up to a known shortwave frequency. Since the Sony 2001 (which is now by his bedside with the Sony small recorder), he has gone on to later models including the 2010 and a McKay Dymek which has been altered to suit his listening. This receiver has four knobs and large digital display which Arthur cannot read, but the knobs are 10,000, 1000, 100 and the last knob indicates every five kilohertz. By placing a marker on the knobs when they are all pointing to 12 o'clock (as in a clock face), they are all on zero; using that system, he can find his way around the dial.

Arthur also has a Racal which is used mainly for band surveys and monitoring, but his BBC work must be on the Sony receiver using a small inverted "L" aerial. The aerial system is fed into an old pushbutton base from a car radio and he has the choice of six aerials: one running northeast across several neighbors' backyards; a 60-meter dipole anchored on the roof of the old Cushen two-story home next door; three short inverted "L's" 20 feet high and 30 feet long; and an active aerial.

Arthur Cushen's first verification was on 22 January 1937 from 3YZ Greymouth in New Zealand. Verifications rapidly increased and today on mediumwave, 2961 stations are verified, including 1161 from North America, 481 from Asia, 144 from Europe, 31 from Africa, 178 stations from Central and South America, and 966 from the South Pacific, Australia and New Zealand — a total of 166 countries. On shortwave, the total is 6342 stations from 294 countries.

Of greatest interest to Arthur are Africa with 614 and South America with 580. There is keen competition in New Zealand between club members as there are two different systems for calculating verified loggings. There is a ladder system in which total verifications advance the DXer from Junior to Intermediate to Senior, etc. They also have a continents list in which the number of verifications from each continent (as we have just discussed) is what counts. Arthur does not report clandestine or pirate radio stations and his reception is of recognized medium and shortwave stations.

On mediumwave, Arthur's prize catches include 5AL Alice Springs, Australia, 30W; VUS Shillong, India, 50W; and from North America, 100W WDEL, Wilmington, Delaware. There are only four states in the United States that Arthur has never heard from New Zealand: Vermont, Maine, Rhode Island and New Hampshire. The best signal Arthur has heard from Europe is the Voice of the 8TH Army in Rimini, Italy, heard on 1241 kHz with 800W in 1945 at the end of the war. Across Asia there are many interesting mediumwave stations and Arthur has several Japanese stations running only 100W.

On the shortwave bands, it is difficult to identify the prize verifications out of a total of over 6000! There are many which have historic value, representing countries which have come and gone.

In order to organize and display the material, all the mediumwave stations are in files, including five large files covering the USA from KA to WZ. Special albums focus on Africa, Asia and Latin America and a huge album gives a selection of the existing stations throughout the world. When a new country arrives, such as Slovakia, Arthur pulls from the hundreds of verifications in storage to add to the album.

The Rewards

You can imagine that the mail is exceptional and Arthur Cushen receives much praise from listeners. A recent letter from Michigan reads, "You have more of an international presence than the United Nations! I hear you regularly on RNZI and HCJB, then on Radio Nederlands, then in a letter to Radio Korea, or a verification from Radio Bulgaria — you're everywhere! Your SW reports are wonderful and timely..."

When attending an Association of North American Radio Clubs (ANARC) Convention in Montreal in 1986 as the guest of Radio Canada International, which was celebrating 40 years of operation, there were many American listeners who felt they knew him. Many commented, "I thought Invercargill was the capital of New Zealand"! At that 1986 Convention, the *World Radio & Television Handbook* was also celebrating 40 years of publication. Arthur has been selling the *Handbook* in New Zealand from the very first issue in 1946.

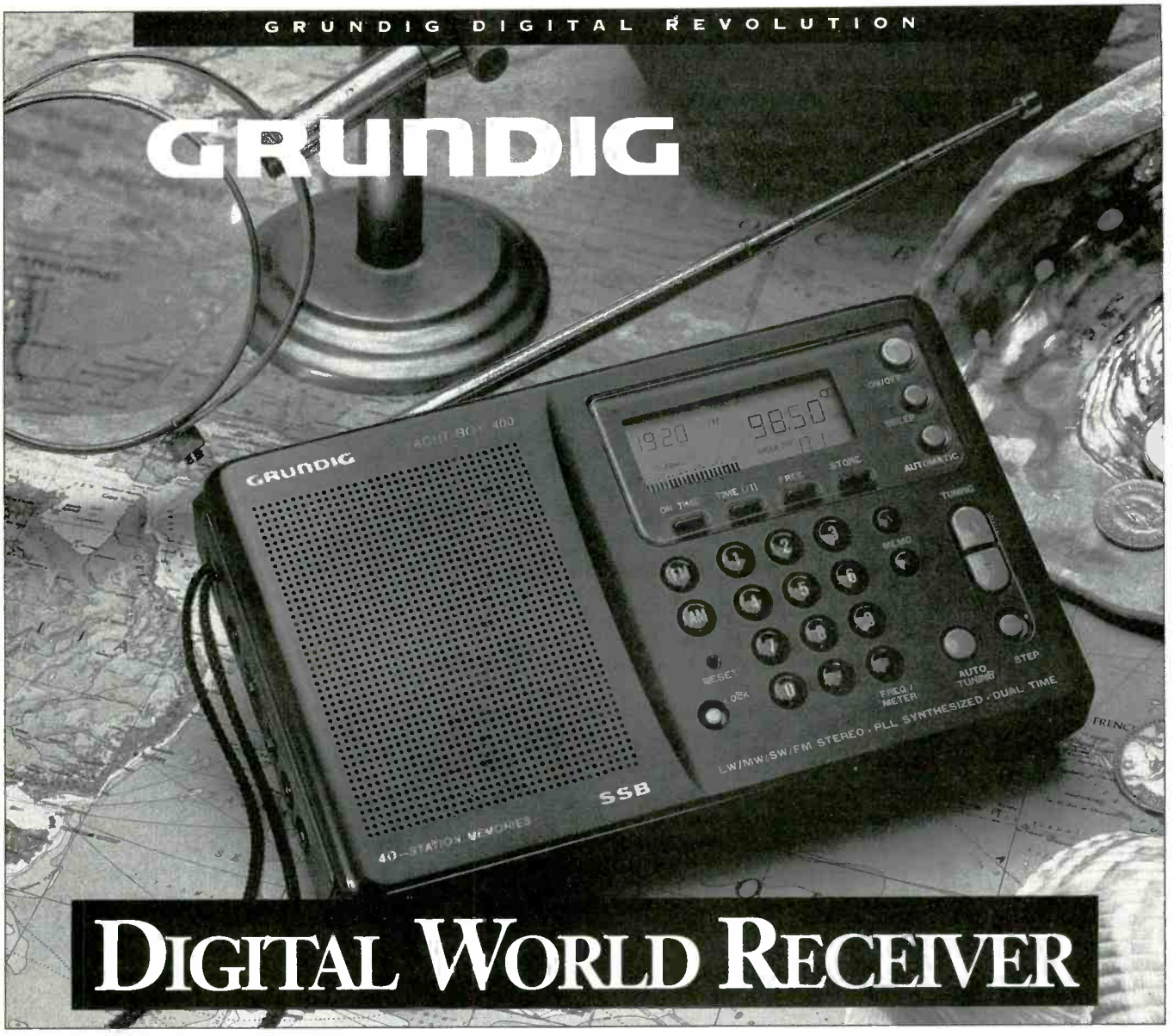
Over this long period of listening there have been many awards for recognition of Arthur Cushen's work. The major one is the "MBE." Presented personally by Her Majesty the Queen, the MBE stands for The Most Excellent Order of the British Empire.

Arthur has been made a life member of many organizations, including the New Zealand Radio DX League. In 1967 he was ANARC "Man of the Year," in 1992 their "International DXer of the Year." At the 1986 Montreal Convention Cushen received several awards including one from Radio Canada International, one from Radio Nederland and another from the members of the Michigan Area Radio Enthusiasts. Arthur has been involved with the formation of the South Pacific Association of Radio Clubs, an umbrella organization which is closely aligned to the Association of North American Radio Clubs and EDXC (European DX Council).

This story would not be complete without thanks to Arthur's wife Ralda who has done so much to help him maintain his independence, his interest, and to overcome his disability. There have been many young ladies who have worked in the office, but the two senior members have been Pauline Winter, who retired last December after 14 years, and Judith Russell, who still works with Arthur and is now Office Manager. Benita Latchford, Mr. Cushen's main shorthand typist (and who also prepared this material), along with several others who work part-time, enable Mr. Cushen to maintain the high quantity and quality of output which is mailed out regularly to individuals, magazines and broadcasters.

This dedicated DXer's voice, writings and braille text have been heard or read by millions of hobbyists worldwide, and it is safe to say that Arthur Cushen's life's work has placed its stamp upon an entire era of radio listening. MT

GRUNDIG DIGITAL REVOLUTION



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GRUNDIG DIGITAL REVOLUTION

Backstage at Your Local Live Shot

By Bennett Liles

Are all TV news people hard of hearing? What are those little hearing aid gizmos they have plugged into their heads? If you saw William Hurt and Holly Hunter in *Broadcast News* (a movie about TV news), you probably have a hint of the fun things you could hear if you could only tap into that line from the TV director to the newsman's earpiece, especially during a fast-breaking story. AND YOU CAN! Lurking in the 450 MHz band are the voices of ENG - Electronic News Gathering.

If you've ever been browsing this band around news time and suddenly heard the sound from one of your local TV stations, your scanner has probably locked onto an IFB carrier. These are VHF frequencies that carry program sound from a local TV station to its reporters in the field wherever they may be covering a local story.

IFB is Interruptable Foldback (often popularly called Interruptable Feedback). The sound signal from the station is routed back to the reporter, interrupted now and then by the TV director in the control room back at the station. If all is going well with the live shot, you may hear only an occasional, "In tape! 30 seconds to live!"

At the end of the live report, as soon as the picture has returned to the anchor desk, the audio signal may be momentarily replaced with, "Good job, guys. You're clear." That is, IF all the little wheels keep turning. When video tape breaks, it might prompt a, "Go back live! Go back to him NOW! Take his mike! Cue John! Go John, GO! ADLIB!" Meanwhile, on your TV screen a suddenly flustered reporter is tearing through his notes and staring into the camera like a deer in front of a truck, trying to believe his own words as he says, "We'll have that video in just a moment."

Even as record snowfall melted away, an Atlanta reporter was describing its disruptions to their operations.

The way this whole sometime-circus begins is always a clue that a live shot microwave link is being set up. One crew member is at the live site, panning and tilting the microwave transmitter antenna and (in the Atlanta area), trying to line it up on the Peachtree Plaza Hotel. That's where the local repeater pickups are and there's probably enough RF on its roof to cook a turkey in your hands.

The one doing most of the talking, though, is the one in ENG control. He or she is watching the remote unit's tone and bars, giving aiming instructions to the remote crew for best picture. The conversation here is just like talking to someone on your roof who is spinning your yagi for a clearer view.

Sometimes the remote crew will already have shot some tape on the scene and will first ask to beam this tape back to the station for editing. ENG control will tell him when to roll his tape. If you don't hear them do this, they probably had the tape carried back to the station by someone earlier. You may also hear the reporter say something about his "incue," the key phrase he uses during his report that cues the station to role in the video tape while he narrates.

Suddenly, a voice comes crackling in. "Go over to channel five and get his tape now." He isn't dispatching an errand to a rival station nor is he switching communication channels. They are just switching to another microwave channel to get a tape feed from another crew at a different live shot location. You are probably expecting this if you've been listening to their comm channels, hearing various crews call in, ready to feed their recorded scenes. By now you already know what tonight's big stories are going to be and which reporter will be onscreen live for the coverage. You may have also heard some of the reporter's TRUE opinions of the people he is covering.

By the time the shot is being received at the station and is ready to go live, you will only hear the station's side of the conversation. This is because, although not yet on the air, the reporter's microphone is hot and is beaming in on the audio channel of the microwave link. The producer will be giving the remote crew, its reporter (and YOU) time cues till live.

Check your TV and make sure it's on the right channel. About one minute before the live shot, switch to the IFB frequency and listen to program sound from the station. As the anchor people start reading the story, you may hear a voice say, "In the monitor" or "In the box." Almost magically there appears in the TV monitor between the anchor people, the remote reporter, microphone in hand, hearing in his earpiece exactly what you are hearing on your scanner. "Standby..... and GO!"

The reporter starts talking. Now you listen for the incue. When you hear that phrase, Shazam! The picture goes to the pretaped scenes. A quick, "In tape" momentarily interrupts the TV sound and then it's back. Soon, the reporter is onscreen again finishing his standup. "Back live!" The

Live Action at the Firestorm in Southern California

Everyone was doing live feeds when the Santa Ana winds blew disastrous wildfires and firestorms into the Los Angeles area the last week of October. TV Interruptable Foldback circuits also blew as the fires spread.

Even if you were not close enough to monitor the IFB action directly on your scanner, satellite dish owners could take monitoring the situation one step further. Monitors equipped for C/Ku-band satellite reception capability got almost non-stop live feeds and TV programming of the unfolding events in the Los Angeles area.

Some local LA stations interrupted regular programming and provided continuous coverage of the disaster. Dish owners saw wild feeds, news feeds, raw video/audio direct from the scene as it happened.

Satellite News Gathering (SNG) technology now allows C/KU-band satellite equipped viewers to see the action as it happens even though they might be thousands of miles away from the action.

Future events of this magnitude will no doubt produce similar results. Dish owners wanting to follow big stories should check the following satellites for video:

Galaxy 2 at 74 west (C-band only), Galaxy 4 at 99 west and Galaxy 7 at 91 west (both C and Ku-band), SBS-5 at 123 west and SBS 6 at 95 west (Ku-band only), and Telstar T2 at 85 west (C-band only). Common audio sub-carriers to tune are 6.2 and 6.8 MHz mono.

reporter goes on talking. He's going long, taking too much time and the director's insistent voice appears. "Wrap!" Immediately, the reporter goes to something like, "And that's about it from here. Back to the studio."

Earlier, you heard the reporter and the anchor arrange a question about what the police chief had to say on the situation. "What does the police have to say, John?" The reporter just happens to have the exact quote at hand, news to everybody but you!

As the anchorman reads into the following stories, you simply switch back to the two-way comm frequency, find which remote unit is up next and tune back to IFB for time cues. If that station is through with its live shots, then tune in another one in town and see if they have one coming up. If so, tune to their IFB frequency and enjoy the show. If the station has a helicopter involved in the day's events, it will likely be found on the same two-way comm channel the rest of the station's ENG crews are on.

When the story is a fast-changing or especially crazy one, the behind-the-scenes conversation can be quite interesting. The most chaotic situation I have monitored was just after the Atlanta Braves won the National League Pennant at Atlanta Stadium in 1992. The remote trucks were all parked outside the field, waiting for the fans to come out, when the game was won on a missed throw to home plate.

Pandemonium! Mayhem! The whole place went crazy. The remote trucks were literally rocking in a sea of hysteria. One station's live shot went awry as the camera appeared to be walking away from the scene. "Steady the shot! Steady the shot!" The director's plea was answered with, "I can't! Some fan is making off with the camera!"

The director insisted, "We're coming to you! Steady the camera!" The cameraman fired back, "I don't HAVE the camera anymore!" Another well-known Atlanta reporter screeched that she was being "brutally kissed" by a host of delirious Braves fans and was retreating to the remote van.

The possibilities are as endless as the types of stories you may see on your local newscasts. They have people paid (not much) to listen to scanners all day. Just listen to them and they'll tell their crews and YOU where the action is. If you are near enough to any metropolitan area to pick up TV on a yagi, then scan amongst these frequencies around 6pm and 11pm. Soon you'll be backstage at your local live shot.

Atlanta ENG frequencies:

450.05	WSB comm channel 1
450.4875	WSB comm channel 2
450.75	WSB IFB channel
455.25	WSB traffic chopper
450.1125	WAGA comm channel 1
450.45	WAGA comm channel 2
455.75	WAGA IFB channel
450.6125	WXIA comm channel 1
450.61	WXIA comm channel 2
450.15	WXIA comm channel 3 (chopper)

A Glossary of Media Communications

By Brian Cathcart

LIVETRUCK : "508 to videotape...I'd like to tune a shot to Remote 1...I'm at 52 degrees and powered up on frequency 4, sending bars and tone."

STATION : "Signal looks good 508...lock it down."

LIVETRUCK: "10-4...508 to editing, I'm ready to send a Package, a VO-SOT and some B-Roll for the tease...let me know when you're rolling."

STATION : "Control to 508, you're up in 20 minutes for a five fifty-eight. Also, let me know when you have a rollcue for the package."

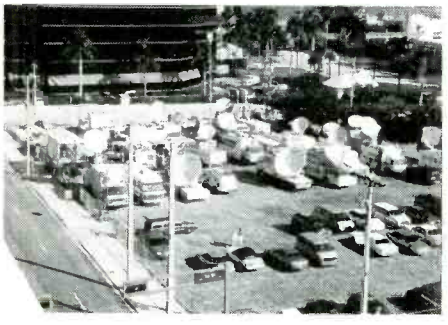
This is an example of what you might hear when listening to television broadcast media on a scanner. As an assignment editor for a TV station, I hear conversations like this every day. To someone not involved in television news, though, the terms used in this conversation can make it difficult to understand. The following pages are a Glossary of the things you can hear:

Mobile Units

Unit Numbers: Some TV stations will use their channel number somewhere in their unit identifications. At our station (Channel 5), we use 3-digit unit numbers with "5" as the prefix; i.e. 507. Some unit numbers are news vehicles, while others are for live trucks. Sometimes reporters are assigned unit numbers as well. News helicopters usually are identified as "Sky", "Air", or "Chopper" followed by the station's channel number, i.e. "Chopper 5".

Live Trucks: There are two types of live trucks, microwave and satellite:

Microwave trucks, known as "ENG" (Electronic News Gathering) trucks, use microwave frequencies to transmit their signals to the station. These signals are "line-of-sight" (maximum distance about 60 miles) and require turning ("panning") the microwave dish on the truck precisely towards the receiver. Microwave frequencies in the 2, 2.5, 6.4, 7, 13, and 40 GHz band are available for this use, but most stations have chosen to use the 2 and 2.5 GHz band for ENG trucks.



Satellite trucks, known as "SNG" (Satellite News Gathering) trucks, use microwave frequencies in the 6 to 7 GHz "C" band or in the 12 to 14 GHz "Ku" band. The signals are "uplinked" to satellites in orbit. From there, they are "downlinked" to receiving stations. When video is uplinked or downlinked it is called a "feed". Satellite trucks can uplink from almost anywhere in the world. However, any truck that is uplinking must setup (or "book") time they use. This time slot is known as a "window". Typically, satellite trucks also have microwave transmitters for times when the truck is close enough to the station. Booking a window almost always costs money, so satellite trucks will use ENG whenever possible.

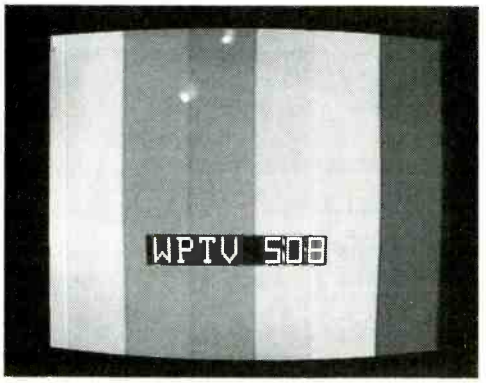
PUP: NBC's acronym for "Portable Uplink Package"; it is uplink satellite equipment that is portable. NBC adds this to their affiliates' main receiving satellite dish to give it the capability to uplink (transmit).

Frequencies: In the opening conversation, the truck operator powered up on "Frequency 4". Microwave frequencies in the 2, 2.5, 6.4, 7, 13, and/or 40 GHz bands are assigned to TV stations as channels for use by live trucks. In West Palm Beach, Florida, nine channels in the 2 and 2.5 GHz band are available for use. Our station is assigned channels 1, 4, and 9; the remainder of the channels are used by other stations.

Tuning in a shot: Before a live shot can be done, the live truck has to establish a signal path to the station or to a satellite (referred to as "tuning in a shot"). For satellite trucks to tune in, the operator moves the truck's satellite dish to the satellite's orbital position. No communication with the station is needed except to learn what satellite is being used. For microwave trucks, adjustments at both the truck and the station must be made, requiring either radio or phone communication between them.

At our station, we have two receivers. Our main one is located on our 1000-foot transmitter tower, so it is referred to as "The Transmitter" or "Remote 1". Our secondary receiver is located at 1515 South Flagler Drive, so it is referred to as "The Fifteen-Fifteen" or "Remote 2". Most stations will label their receiver sites in a similar manner.

Again, in the conversation above, our live truck is tuning the shot to the transmitter. This receiver is at the top of our transmitter tower and can be turned 360 degrees. The live truck operator has to give his location in degrees so that the operators at the station know which direction to turn the receiving dish.



"...bars and tones...": The live truck will transmit a signal of color bars and a steady tone to give the operators who are tuning the shot a way to find and maximize the signal. It allows them to see if any color, video, or audio level adjustments need to be made. There is also an identification number on the color bars, such as "WPTV 508". This ID will contain the station callsign, and usually the truck's number and/or identification.

Station Departments

Videotape: This department is where all of the live shots are received. This receiving area can be called the feedroom, the feedpoint, or any other name that applies to what the department does.

News Editing: Here the video is edited for the news program. At our station, it is also where video from the live trucks is recorded (some stations record incoming video at the feedpoint). On the radio, this is usually referred to simply as "Editing".

Production Control: At our station, everything that appears on the air during the news is controlled from this room. The Director, Audio Technician, Graphics Operator, and Producer all work here during the show. Also called "Control Room", "News control", or simply "Control".

Newsroom: This is where all the news is collected and prepared for the News show. On the radio, it's referred to as "base", "news base", "news desk", or simply "Newsroom".

Engineering: The engineering department is in charge of editing commercials (sometimes handled by production personnel), recording shows and satellite feeds, tuning in live shots, and repairing and maintaining equipment. They may have their own channel or use the same channel that news personnel use.

Master Control: Everything that goes on the air passes through Master Control: commercials, TV shows, and the output of Production Control.

News Show Terms

Block: A segment of time between commercial breaks. Most stations will refer to their blocks by letters, i.e. the first block as the "A-block", the second as the "B-block", and so on.

Kicker: A light-hearted segment at the end of the news broadcast to end the show on a positive note.

Spot: Commercial

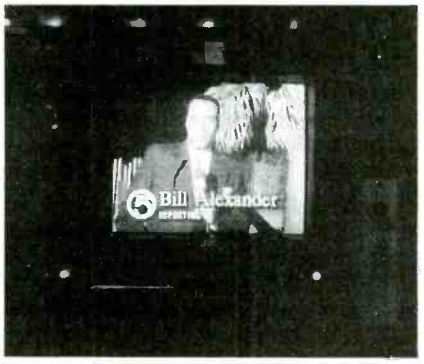
Tag: A segment at the end of a News package where an anchor will give additional information relating to the story.

Tease: A preview showing what's coming up in the show; it "teases" people to watch. Also called a "Toss". The preview for the 6 o'clock news, for example, is at 5:58 on the clock, so it is referred to as "the five fifty-eight."

Video terms

VO: Abbreviation for "Voice-Over" in which an anchor or reporter narrates while video is being played; their voice is placed over the video. Pronounced "VEE-OH" or "VOH".

SOT: Abbreviation for "Sound On Tape". Any kind of audio that is recorded with the video, whether it is background audio (i.e., the crackling sound of a house on fire) or an interview with someone. Pronounced "S-O-T" or "SAHT".



NAT: Acronym for NATural sound. Also called NAT-SOT, it is basically the same as SOT, but refers only to background audio that is recorded (no reporter voice or interview).

Bite: An interview with someone. (VO, SOT, NAT, and Bite can be combined depending on what the video contains, like VO/SOT or VO/Bite.)

Stand-up: The familiar shot in which the reporter narrates a portion of their story in front of the camera.

B-roll: Video that corresponds with a narrated description in a story. For example, if the story was about a new seat belt law, the B-roll would be video of a car accident or a seat belt in a car.

Package: A self-contained story by a reporter, consisting of video (B-roll), interviews (Bites, SOT), and the reporter narrating both in front of the camera (Stand-up) and while video is being shown (VO).

Supers: Short for "Super-imposed". These are the word graphics on the screen that describe a person, location, or other information that helps with the story. For example, when a reporter is talking into the camera (doing a Stand-up), the super would be his or her name. Many stations use a graphics computer called a "Chyron" (KI - RAHN) to do this. Also called "Graphics".

Rollcue: A word or phrase that an anchor or reporter says that cues the Director to roll video (VO) or a Package.

Outcue: A word or phrase in a Bite that signals a director when to cue the reporter or anchor to start narrating again.

Wipe: Switching from one video source to another by literally "wiping" the old video source off of the screen. This is done by a switching computer that can change from one source to another in a variety of ways; it can "explode" the screen, spin it away, dissolve it, or do any one of several other tricks. Generally, no matter how the computer switches it, it is always referred to as a wipe.

Pre-prod: Short for "Pre-production" — any special effects for a Package that have to be produced before the package can be edited.

"In the panel": When a live shot is done, the signal sent from the live truck can be super-imposed on a screen panel next to the Anchor in the studio. A technique known as "Chroma-Key" uses blue as a medium for super-imposing these images. When the live signal is being shown while the Anchor is introducing the Reporter, the Producer will let the Reporter know this by saying "in the panel" over the radio.

"Split Screen": Same as "In the Panel", but places the images of the Anchor and the Reporter side-by-side. No blue screen (Chroma-Key) is needed for this.

"Roll tape": Begin playback or record on a video tape.

Other equipment

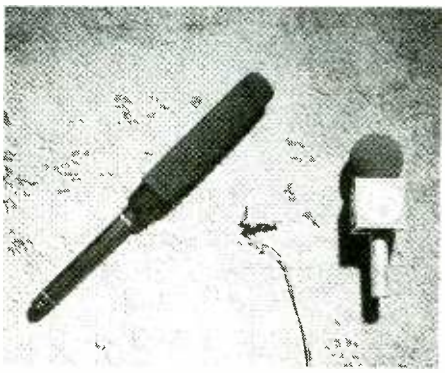
IFB: "Interruptable Fold Back" is the audio which passes through the earpiece that an anchor or reporter wears. In the studio at the station, the anchor's IFB is for instructions from the Director or Producer. For a Reporter doing a live shot, the IFB has program audio so that he or she can hear when it is their time to narrate.

There are several ways IFB can be relayed. Most stations have a reserved phone number that ties directly into their audio control board; when reporters call this number (usually with a portable cellphone), program audio is sent through it. The reporter's earpiece is then plugged into the phone, allowing the reporter to hear the audio (which can be interrupted by the Producer or Director for any instructions they may have).

If the Reporter is not able to call the IFB number, he or she can use a TV to listen to the program audio. The disadvantage to this is that instructions cannot go into the reporter's earpiece. Additionally, some stations will have frequencies reserved for IFB use. These frequencies are set up to do the same thing as the IFB phone number; program audio is broadcast on it, and it can be interrupted by the Producer or Director for instructions.

Mix-Minus: On an IFB, this allows the reporter at the live shot location to hear the program audio through their IFB earpiece, but without ("minus") his or her own voice.

Mic ("Mike"): Short for Microphone. There are three main types : Lavalier (clip-on), handheld, and shotgun (used on cameras or placed on long booms). May be wired or wireless.



Frequencies

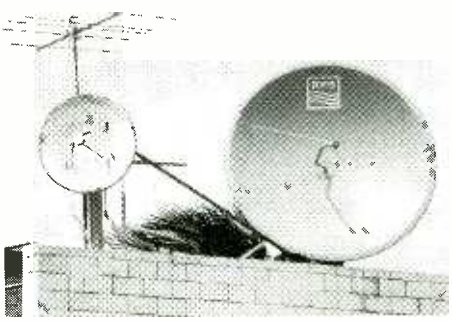
25.670 to 26.470 MHz: Used rarely, mostly for wireless microphones and for communications in stations with older equipment.

152.875 to 153.3625 MHz: Used for communications or Remote Pickup Broadcast Stations (RPU's, which are mobile/portable live broadcast facilities, like live trucks). This band is shared with the Motion Picture Industry, Special Industrial, Petroleum Production, and Manufacturers.

161.6275 to 161.7725 MHz: Can be used for low power communications or RPU's by TV and Radio broadcasters. At our station, we use 161.640 for a vehicular repeater in two of our live trucks.

450.000 to 451.000 & 455.000 to 456.000 MHz: Most broadcast media organizations (TV and Radio) will use these bands for their operations. Most commonly, 450-451 MHz band is the repeater output and the 455-456 MHz band is the input, but sometimes that's reversed. These frequencies can also be used for wireless microphones and RPU's. Generally, you will find frequencies separated by 12.5 kHz steps (i.e. 450.2125, 450.5875) are the operations channels, and even frequencies (i.e. 450.250, 450.350) are IFB channels. Some channels are used for Studio-To-Transmitter (STL) audio links.

944.000 to 952.000 MHz: Not used by TV broadcasters, only radio broadcasters for STL's. Microwave frequencies are used by TV broadcasters because a larger frequency bandwidth is required for broadcasting a TV signal, and microwave frequency ranges are the only ones allocated by the FCC with enough space to do so.



Wireless microphones: Wireless mics can operate on a wide range of frequencies. The majority of those used by TV broadcasters operate within frequency ranges assigned to television channels ("BT" service) and within the frequency ranges listed above ("BA" service). However, due to their low power output, they can operate on almost any frequency as long as they do not cause interference. All of our field wireless mics operate between 171.000 and 216.000 MHz.

Business bands: Some broadcast media organizations use business band frequencies instead of the standard broadcast-assigned frequencies. Broadcasters can get licensed within business bands by applying under their company name ("Scripps-Howard Broadcasting" instead of "WPTV", for example). Several stations are using trunked radio SMR's (rented from a local radio shop) to make their transmissions difficult to monitor by their competition.

Cellphones: It's hard to find a station that doesn't use cellular phones. Although not completely private, cellphone communications pretty much keep the competition from listening in. It is not worth the expenditure of time or the risk of arrest from the "cellular police" on the outside chance one might hear TV news crews talking to their stations or IFB's.

Traveling Broadcasters

When broadcasters such as ESPN or NBC travel to cover a football game or special event and they need frequencies to use in their own radio equipment, the first thing they do is contact the area Frequency Coordinator. This is the person in charge of assigning frequencies to broadcasters for his area, including those who set up temporary broadcasting facilities.

The traveling broadcasters will typically stay in the 161.640-161.760 MHz, 450-451 MHz, or 455-456 MHz band for their operations, so the frequency coordinator will assign these broadcasters any frequency that is not used by a local TV or radio station. This means that if you found NBC using 450.850 in Miami, they may not be able to use it in Orlando. The frequencies are assigned based on availability.

Of course, these broadcasters can also use frequencies in the business bands. Usually, they will contact a local radio shop that rents 2-way radios and holds business-band frequencies. This way the broadcaster does not have to carry radio equipment with them or worry about finding available frequencies. The radio shop can also rent out radios with Broadcaster-assigned frequencies, but the radio shop must consult with the Frequency Coordinator before he can do this.

Special thanks to the photographers, engineers, and technicians at WPTV who took the time to contribute their help and input to this article.

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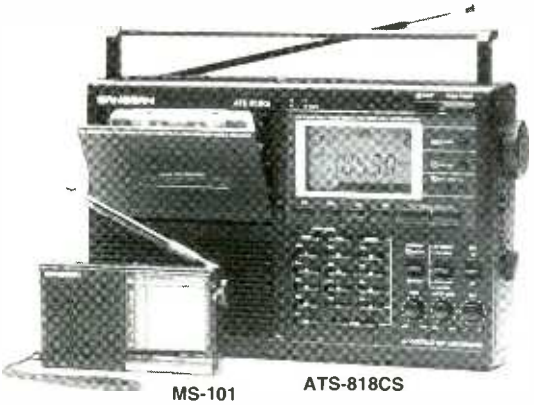

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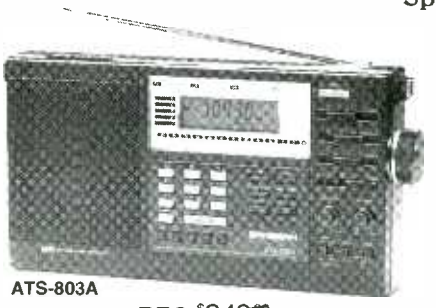

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Inside NOAA Weather Radio

By Ken Reitz

What's the first thing complete strangers talk about? What do even the non-superstitious consult before making plans? The pleasures and tragedies of the weather are among the very few experiences shared equally by most inhabitants of the world.

In the United States there is a radio network of nearly 400 stations boasting millions of listeners, yet it never shows up on any radio marketing survey. The National Oceanic and Atmospheric Administration (NOAA) of the U. S. Department of Commerce is, in fact, the "Voice of the National Weather Service." Twenty-four hours a day, seven days a week, Americans with radios capable of receiving these stations depend on NOAA Weather Radio.

Operations room at the Richmond office of the National Weather Service. 2 meter amateur radio station and packet terminal at far right.

In January 1975, during the Nixon administration, NOAA Weather Radio was created to provide the public with direct warnings of natural disasters and impending nuclear attack. It can also warn of impending man-made disasters such as toxic spills and nuclear power plant accidents. The system is, in fact, the only federally operated network which broadcasts directly to its citizens.

For people living on the thousands of miles of coastal and inland shores these transmissions have particular significance. With the ability to warn of approaching hurricanes, coastal flooding or just plain bad boating weather, advice from the National Weather Service is keenly heeded.

People living in America's midwest depend on NOAA Weather Radio's warning tone which causes an otherwise muted radio to spring to life with a warning of immediate severe weather. For many, this brief lead-time could make the difference between life and death in "Tornado Alley."

Tuning Into The Network

While most of the 380 Weather Radio stations are owned by the Federal Government, the Department of Commerce notes that a few are funded by "private interest groups" and even fewer are "low powered experimental repeater stations serving a very limited local area." All operate on one of seven frequencies in the VHF-FM band (162.550, .400, .475, .425, .450, .500, .525 MHz). According to Commerce Department information, a similar, though much smaller network transmits weather information across southern Canada using the same frequencies.

Radios capable of receiving these broadcasts are numerous. Virtually all scanners, most amateur 2 meter transceivers, many CB radios and countless battery operated AM-FM TV band portables available in every town in America can receive the NOAA broadcasts. How effective the reception will be depends on three factors: first, the over-all quality of the receiver, second, the antenna used, and third, the distance between the transmitter and your receiver. Generally, the NOAA Weather Radio stations maintain a transmitting radius of 30 to 40 miles. Even so, moderate to poor quality receivers will have difficulty picking up a good signal at half that range.

A Visit To NWS, Richmond

Last spring our local NOAA Weather Radio station, WXK65, announced a special class for those interested in becoming part of the Skywarn spotter network. An assortment of hams, one avid CBer, and folks with an interest in weather showed up for the class, taught by an energetic staffer. It lasted about three hours and included a tour of the NWS offices. A month later I arranged for a more in-depth visit and interviews with station personnel.

The offices of the National Weather Service in Richmond, VA, are in a nondescript wing of Byrd International Airport. There is little, in fact, to indicate the presence of this office except for a small fenced-in area of the parking lot in which are found several rain gauges of varying vintage, a ceilometer (for measuring the cloud ceiling) and a sunshine recorder.

Supervisor Central Wills, a 19 year veteran of the NWS who spent 12 of those years in the Richmond office, took me into the operations room where work stations were packed with an assortment of esoteric weather related equipment. Here digital and analog instruments silently record or display the factual representation of a summer day in central Virginia. Two red digital clocks show the local and UTC time. Wills notes: "This office is always on Standard Time."

Instruments with rotating paper cylinders record the barometric pressure, ceiling height and more, while digital displays show the wind speed and direction. The telephone rings virtu-

ally every minute as Richmonders preparing for a day at the beach or a trip to the mountains call in to find out the latest. They apparently have not heard of NOAA Weather Radio.

The gear ranges in age from the most sophisticated CD/ROM based training computers (such as that used to train the staff for the up-coming Doppler radar installation), to what appears to be surplus military equipment with primitive screen graphics. Indeed, equipment for the Weather Service would appear to be a fairly low Federal budget priority. The weather radar used at Richmond dates from 1957.

A Good Future At NWS

Central Wills maintains that it is "...an exciting time for anyone interested in meteorology." The next three years will see tremendous changes in the National Weather Service. Not the least of these changes will be the addition of an extensive network of 160 Doppler weather surveillance radar installations (known as WSR-88D) which will "allow forecasters to 'see' inside storms and detect wind-driven rain that is carried toward or away from the radar."

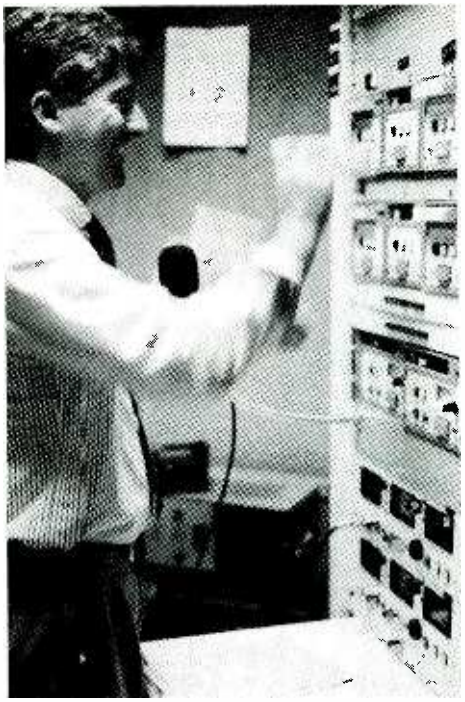
To keep up, the NWS will be looking for an additional 500 interns. While in the past many came to the NWS from the U.S. military, the downsizing of that institution will require the Weather Service to look to college graduates to fill new positions. According to Commerce Department information, "...The existing 52 WSFO's (Weather Service Field Offices) and 197 smaller service units will be phased into an integrated national system blanketing the 50 states and Puerto Rico."

While Wills was describing some of the equipment, a speaker in the console came to life requesting a roll call of sites comprising a regional emergency network. The excercise completed, and a few phone calls later, Wills showed me the computer which is used to transmit a severe storm warning. To demonstrate the speed with which the system could react to severe weather, he ran a test warning. Within two minutes the necessary information was detailed, including the exact location of the storm, relayed and broadcast state-wide with confirmation.

Another computer station was, in fact, a direct teletype link to the control tower at Byrd Airport. Every half hour the Weather Service sends pertinent weather information to the tower for use by the many pilots flying in the area.

Still another computer was dedicated to the Integrated Flood Warning System which monitors automatic rain gauges throughout the state. The data is transmitted via microwave to the Richmond office where flood warnings can be issued if the rainfall is significant.

In one corner is found the Skywarn Net desk. Here an Icom IC 27A two meter amateur radio



Richmond NWS staffer Dave Lipson changes weather broadcast tapes at NOAA Weather Radio WXK65.

transceiver, hooked up to an Isopole antenna on the roof of the building, stands ready in case a severe weather watch is issued for central Virginia. The rig is owned by the Richmond office and operated by Billy Walton, KC4ETD, a retired electrician and former volunteer fireman.

Inside WXK65

NOAA Weather Radio WXK65 is located in a small 8 x 10 foot, sound-deadened room with double glazed windows, and looks out onto the main operations center. Here, in a stack over six feet tall, are six rack-mounted, broadcast quality Ampro tape cartridge playback machines and two recording decks. Each playback deck runs a type of weather information: current conditions, forecasts, boating advisories, public information such as pollution alerts, etc.

Station staff can record updates or emergency information and slip the new tape into a playback deck to be played in sequence or immediately. If necessary, the official alarm warning could be sounded and a staff member could go on live. The audio from the console is fed via landline to the actual transmitter atop the State Police radio tower on the other side of the city.

The announcing duties at the weather station are clearly enjoyed by everyone. Dave Lipson particularly likes to think of himself as an on-air personality and relishes the widespread, if anonymous, fame his voice enjoys. Once, he says, he was actually asked for his autograph by a WXK65 fan who saw him at a local boating show.

There was, inside the Richmond NWS office, the same feeling one gets in any small business operation; a certain camaraderie among the workers, a real sense that everyone there is enthusiastic about their work. Yet, curiously, the office has no weather satellite capabilities. At a time when the government has spent so much money on weather satellites, both polar orbiting and geostationary, one wonders why an NWS office doesn't at least get to view the effort. Forecasting for the area is done from a regional office, which in this case is in Washington, D.C., not at the local office, and it can be argued that such equipment would be a waste of taxpayers money.

The other curiosity one could not help but notice was the color TV monitor above the main console. Though it was off while I was there, I was told it was tuned to The Weather Channel.

Do-It-Yourself Meteorology

Most people are content to catch the daily forecast on the radio or glance at the thumbnail sketch in the newspaper. The more curious stay glued to The Weather Channel. But, the true weather enthusiast can go just as far off the scale as any radio buff.

In fact, the weather and radio hobbies are closely linked. Many decades ago avid shortwave listeners, using surplus military or weather service facsimile machines, found they could copy weather maps over shortwave frequencies. As technology improved these radio/weather amateurs followed closely behind. With the advent of digital transmissions, solid state receivers, satellite telemetry and imaging, amateur radio/weather enthusiasts developed networks for exchanging information. One place to find some of these networks is to look in the *World Ham Net Directory* (available from Grove Enterprises, ARRL, and elsewhere).

Just as with the amateur radio hobby or with the satellite TV hobby, the weather hobby has become one with no limits. It is possible to sink ten thousand dollars into your own weather station. From commercial grade weather instruments to turnkey off-the-shelf satellite imaging systems, there is truly no end to the amount one can spend!

However, as with the radio hobby, part of the fun is in doing as much of it yourself as possible for as little as possible. To that end there is a great deal of written material to help. Hopefully this article will give you a map of the hobby and allow you to explore it as deeply as your interest or finances will take you.

The $20 Weatherman

The easiest way into this hobby is through radio and TV. First, a NOAA Weather Radio is a must. For around $20 Radio Shack sells an adequate, close range, tunable Weather Radio. After listening to this a few times you'll either be fascinated or totally bored. It's the first true test of your interest.

The U.S. Department of Commerce offers a complete list of the NOAA Weather Radio Network including each city in every state with its assigned frequency. They also have a list of NOAA Weather Radio receiver manufacturers for both industrial and consumer grade radios. Both are free by request at the following address: National Weather Service (Attn: W/OM11), National Oceanic and Atmospheric Administration, Silver Spring, MD 20910.

Public Television has an excellent weather program on every day called *A.M. Weather*. Produced by Maryland Public Television, this fifteen minute program is a no-nonsense fast paced look at weather in the lower 48 states with actual meteorologists. You can escape the network weather clowns and get the real story (without commercials) each morning.

To find the station and time in your area to watch *A.M. Weather* write for their free station listing. There are over three hundred stations listed including two in Canada. The listing includes a chart that gives a full color guide to weather map symbols and aviation weather abbreviations. Send a self-addressed stamped envelope to: A. M. Weather, Maryland Public Television, 11767 Owings Mills Boulevard, Owings Mills, MD 21117. They will not respond without the SASE. You'll also receive a pitch to donate directly to A.M. Weather to help ensure it stays on the air.

Satellite TV viewers may watch *A. M. Weather* on Spacenet 4 channel 6 from 6:45 a.m. to 9:30 a.m. in repeated 15 minute blocks.

A. M. Weather also makes available PC Weatherman, an opportunity to "...use your home computer as your own, personal weather station, providing instant access to the latest National Weather Service observations and forecasts for your local area or anywhere in the country." Weather data from PC Weatherman is accessed free from anywhere in the country on toll free lines. There are no charges regardless of how often you connect. You'll need a PC compatible computer with at least 512K RAM, DOS 3.0, a modem, and a EGA or VGA color or monochrome monitor. Cost for the software is $25. For complete details ask for information at the above address for Maryland Public Television.

Skywarn Spotter Program

The National Weather Service maintains an extensive network of trained severe weather spotters. These spotters are volunteers with little or no experience in meteorology. After a brief training session spotters are assigned a code number and given an 800 reporting number in the case of severe weather in the spotter's normal location.

This program provides the Weather Service yet one more bit of data to help pinpoint or track severe storms as they develop. Even with the use of Doppler radar, these direct observations may

Table 1

Starter list of companies selling weather reception equipment and related products.

A & A Engineering
2521 W. La Palma, Unit K
Anaheim, CA 92801
Phone: 714-952-2114 FAX: 714-952-3280
(HF WEFAX and Satellite WEFAX kits)

Down East Microwave
RR 1 Box 2310
Troy, ME 04987
Phone: 207-948-3741
(1691 Low Noise Amplifier, UHF yagis)

GTI Electronics
1541 Fritz Valley Road
Lehighton, PA 18235
Phone: 717-386-4032 FAX: 717-386-5063
(Receiver Panadapters, Wideband Pre-Amps, Satellite Imaging Systems)

Hamtronics, Inc.
65 Moul Road
Hilton, NY 14468-9535
Phone: 716-392-9430
(Weather Satellite Receiver Kit)

OFS WeatherFAX
6404 Lakerest Ct.
Raleigh, NC 27612
Phone/FAX: 919-847-4545
(Weather Facsimile Software)

Quorum Communications, Inc.
8304 Esters Blvd. Suite 850
Irving, TX 75063
Phone: 214-915-0256 FAX: 214-915-0270
(Remote Sensing Data Hardware and software; 1691 downconverters, complete systems)

Satellite Data Systems, Inc.
P.O. Box 219
Cleveland, MN 56017
Phone/FAX: 507-931-4849
(Complete meteorological satellite systems; PC based weather display systems; demo disks available)

Spectrum International, Inc.
P.O. Box 1084
Concord, MA 01742
Phone: 508-263-2145
(complete weather satellite systems)

Vanguard Electronic Labs
196-23 Jamaica Ave.
Hollis, NY 11423
Free Info BBS (200-2400 Baud): 718-740-3911
24 hours/day 7 days/week.
Business Phone: 718-468-2720

The Weather Station
P.O. Box 1109
New London, NH 03257
(Professional grade weather instruments for the amateur meteorologist.)

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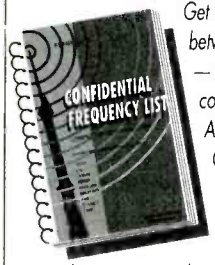


Get 450 pages of frequencies between 1613 kHz and 30 MHz — listed by frequency with a complete reverse callsign list. All stations in HF range: voice, CW, RTTY and FAX. Details on marine, embassy, aircraft, press, weather, INTERPOL, time, channel markers, numbers stations and more. Metal spiral binding allows the book to lay flat and the pages remain in tact even after months of use.

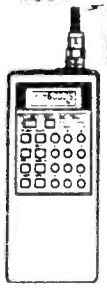
QST Magazine says: ***"...recognized throughout the world as the most comprehensive list of shortwave utility stations available. What Passport to World Band Radio is to shortwave broadcasting, Ferrell's Confidential Frequency List is to utility DXing.***

GILFER SHORTWAVE
52 Park Ave., Park Ridge, NJ 07656
201-391-7887

GALAXY ELECTRONICS

67 EBER AVE. BOX-1202
AKRON, OHIO-44309
216-376-2402

NEW



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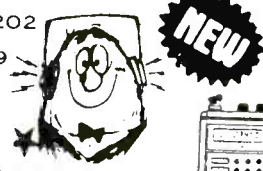

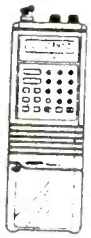

BC-2500XLT
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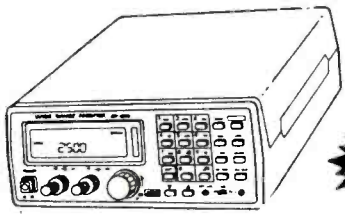
AR-2500
2016ch, 1-1,500 MHZ, LCD Display, AC/DC, Search, Priority, All Accessories **$465**



NEW

NEW

BC-890XLT
200ch, Turbo Scan, 29-54, 108-174, 216-512, 806-956 MHZ, Backlit, Delay, Priority, More! In Stock! Call!

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R-2000 150KHZ-30MHZ, 10 Memorys	669.00
ICR-71A .1 TO 30MHZ, 32 Memorys	1015.00
ICR-72A .1 TO 30MHZ, 99 Memorys	939.00
ICR-7000 25 TO 1300MHZ, 99 Memorys	1225.00
ICR-7100 25 TO 2000MHZ, 900 Memorys	1250.00
DRAKE R8 100HHZ TO 30MHZ, 100 Memorys	995.00
FRG-8800 150KHZ TO 30 MHZ, 12 Memorys	699.00
FRG-100 .10 TO 30MHZ, Memorys	549.00
NRD-535D .1 TO 30MHZ, Memorys, Digital	1715.00

POLICE/FIRE SCANNERS

BC-200XLT, 200ch, 29-54, 118-174, 406-512, 806-952	249.00
BC-2500XLT, 400ch, 29 TO 1.3ghz & FM, Turbo Scan	CALL!
BC-760XLT, 100 ch, 29-54, 118-174, 406-512, 806-956	279.00
BC-855XLT, 100 ch, 29-54, 108-174, 406-512, 806-956	225.00
BC-8500XLT, 500ch, 29 TO 1.3ghz & FM, Turbo Scan	CALL!
AR-1000XLT, 1000ch, 500KHZ TO 1300 MHZ	415.00
AR-1500XLT, 1000ch, 500KHZ TO 1300MHZ, PLUS SSB	469.00
AR-2500, 1 TO 1500MHZ, 2000ch, LCD DISPLAY	449.00
AR-3000A 100HZ TO 2000MHZ, 400ch, LCD DISPLAY	995.00
ICR-100 100KHZ TO 1800MHZ, 121ch, LCD DISPLAY	625.00

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determine whether or not to issue local severe weather bulletins or warnings. Spotters are often amateur radio operators who can literally report from the field via radio. Most local Weather Service Offices have a spotter training session once a year. Call your local office to find out when their next session will be.

Coastal Weather Information Maps

The National Ocean Survey makes available a series of Marine Weather Services Charts. These 12" x 19" charts are packed with information pertinent to all U.S. ocean coasts. The charts feature maps of 15 different coastal regions from Eastport, Maine, to the Alaskan waters, pinpointing the location of each NOAA Weather Radio transmitter site; day and nighttime warning display sites both in and out of boating season; U.S. Coast Guard stations, Light Stations, and marine police boat locations.

There are also weather notes; examples of day and nighttime warning signals; AM & FM radio stations in the area, their frequency and time of National Weather Service direct forecasts and warnings; location and frequency of radiotelephone stations in the area which broadcast marine weather forecasts, and much more. For information on obtaining these charts and their cost write: National Ocean Survey, Distribution Division (C44), Riverdale, MD 20840.

Weather Data Via Shortwave Radio

Readers of this and other electronics hobby magazines are already aware of the possibility of receiving weather facsimile (WEFAX) maps, charts and satellite photographs via land based radio stations operating in the shortwave spectrum. These magazines have columns devoted to such reception and have ads from many companies specializing in this part of the hobby. Write or call for a catalog from the following excellent sources of information and equipment related to WEFAX:

- Amateur Electronic Supply
  5710 W. Good Hope Road
  Milwaukee, WI 53223; ph 414-358-0333
- Grove Enterprises
  P.O. Box 98,
  Brasstown, NC 28902; ph 704-837-9200
- Universal Radio Inc.
  6830 Americana Pkwy.
  Reynoldsburg, OH 43068; ph 614-866-4267.

Tuning Into The Weather Satellites

The ultimate in weather reception is operating your own weather satellite receiving station. There are two ways to do this. First is the low orbit NOAA weather satellite system comprised of several polar orbit spacecraft in the APT (Automatic Picture transmission) mode. The second type is the GOES (Geostationary Operational Environmental Satellite) operated by the U.S. government, and METEOSAT, a similar satellite operated by the European Space Research Organization.

The single most authoritative text on this subject is called the *Weather Satellite Handbook* by Dr. Ralph E. Taggart, WB8DQT. The book is published by the American Radio Relay League and is available at all the usual radio hobby outlets. Taggart's articles on the subject often appear in *QST*, the League's magazine for amateur radio. This book is the best starting place for anyone wanting to learn more about weather satellites and their reception.

Finally, for those who have finally dug themselves inextricably into this hobby there is only one place to go: *WeatherSat Ink*. This quarterly magazine is known as The Environmental Satellite Applications Journal. Here you'll meet people who are into the hobby even deeper than you and what's more, they're determined to put you in the same fix!

Just how troubled are these people? The latest issue shows a portable APT satellite reception station on a motorcycle! Edited by Tom Glembocki, KO4BD, this magazine begins where all the other hobby magazines stop. In straightforward style *WeatherSat Ink* presents news and views, and on-going experiments with homebrew reception gear in an area of electronics which still has plenty of work for the experimenter. You'll see fascinating photos taken directly off the satellites, find out the latest status on America's weather satellite fleet, and get details on hard-to-find software and publications. Subscriptions are $18 per year by writing WeatherSat Ink, c/o Bluebird Greenhouses, 4821 Jessie Dr. Apex, NC 27502 or FAX 919-362-5822.

SPEC-COM Journal is published bi-monthly and features columns on WEFAX, APT and GOES weather reception in addition to all the other digital amateur communications modes. Annual subscriptions are $20 per year from SPEC-COM Journal, P.O. Box 1002, Dubuque, IA 52004 or call 319-557-8791 or FAX 319-583-6462. They ask $3.75 ppd for a current or sample issue.

So, what's your real interest in the weather? I hope that this article has piqued your interest and that you'll dig a little deeper into a subject that holds great fascination for many. MT

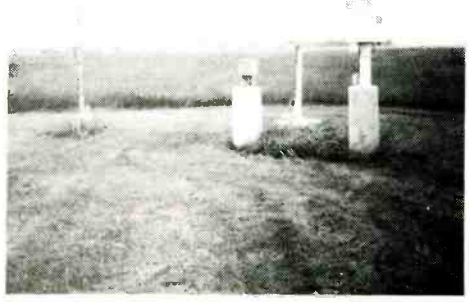
Visit to an Automated Weather Station

By Lloyd Matthiesen

If you have been beacon hunting on the low frequency, or longwave band lately, you may have noticed stations continuously droning out aviation weather in a staccato, synthesized voice. These are the new Automated Weather Observation Stations (AWOS), which send out reports via LF beacons, and telephone.

I was given a tour of the AWOS at the Pipestone Municipal Airport here in Minnesota by Clarence Taylor, the airport manager. I was particularly baffled about how visibility and cloud cover could be measured automatically. Taylor explained that a horizontal laser beam strikes a sensor approximately three feet away. Data from this, along with other factors such as temperature, dew point, time of day or night, and precipitation, produce a visibility figure expressed in miles.

Cloud cover is measured by a solometer, which uses a radar-like principle. It directs a vertical laser straight up to reflect off the clouds and measures the time it takes to reflect back to a sensor.



Closeup of the AWOS installation. L to r: laser visibility, junction box, rain gauge and solometer.

Also measured are temperature and dew point, precipitation, wind direction/velocity, and air pressure. The information is sent to a computer in the airport office. The data is also sent in digital form to the National Weather Service which makes it available nationwide. All data is updated every minute. The system even generates maintenance data, telling Clarence when to clean off the lenses on the solometer!

Table of Contents photo:
Ceilometer (top of picture) from which a laser beam is bounced off the bottom of the clouds to a mirror; the distance is displayed in the NWS office. Two rain gauges see little duty during an unusually dry summer.

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A compact 11" wide by 5-1/4" high and weighing a scant 10 pounds, the SW8 runs on optional internal batteries or its supplied AC adaptor. High-contrast, backlit LCD display provides 100 Hz tuning accuracy. Dual-mode clock timer and 70 scannable memories round out the key features of this welcome receiver!

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0.5 microvolt sensitivity

Dual 6/4 kHz selectivity on AM 2.3 kHz selectivity on SSB

Dual-mode clock/timer

70 scannable memories

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THE ANNUAL MONITORING TIMES CONVENTION

A Convention With Class!

Photos By Harry Baughn

The Fourth Annual Monitoring Times Convention was perceived by its planners to be a watershed year—would the convention continue? Where would it continue? If so, where? And in what form?

By the end of the weekend, all seemed clear; YES!—there appears to be a solid base of support for the convention and all indications are that it will only continue to increase with the years. Not only that, but consensus was that, for the time being at least, the convention has found a home at the confortable and congenial Atlanta Airport Hilton.

Guest speaker Carole J. Perry and Publisher Bob Grove

Banquet speaker Carole Perry, noted amateur radio educator, was taken by surprise by the dedication and the professionalism shown by all participants. "Now, this is MY kind of convention!" was her reaction. Her enthusiasm and energy were contagious—in fact, several Grove/*MT* staff members began taking a ham class even before the month was out!

That the *MT* Convention "has class" is no surprise to us. Exhibitors recognize it, too: an average of $15,000 worth of prizes were given away during the weekend; two new products premiered at the convention—a new shortwave receiver (the Drake SW-8: see "What's New" for more description) and the new version 3 ScanCat software; and, for the fourth year running, exhibitors reported record sales. Registrants had the opportunity to choose between 34 seminars!

That, in fact, was the major criticism: one could not attend all the seminars one wanted to without cloning! Some tried, using tape recorders, but it was an unsatisfactory solution. Perhaps it's one reason 80% of the attendees return each year!

International broadcasters, such as Radio Finland, played a dual role: exhibitor and program participant.

Other Highlights

The contribution by international broadcasters Frederica Dochinoiu (Radio Romania), Juhani Niinihsto (Radio Finland), and Kim Shippey (Monitor Radio International), was warmly appreciated by the entire body. Although we anticipate a greater number of shortwave broadcasters at the fifth convention, no one could have represented the variety to be found in international broadcasting with more eloquence, wit and humor than these three personalities. There is no doubt that international delegates will have a more prominent role to play in future conventions thanks to the participation of these three.

For Don Dettenmeyer of Centerville, Ohio, and Charles Nobes of Columbus, GA, the highlight had to be winning the grand prizes—two ICOM R7100 VHF/UHF receivers! ICOM also kept the excitement going in the exhibit hall by giving away a personalized jacket every half hour and the powerful little R1 handheld general coverage receiver every hour.

Optoelectronics awarded the new M1 frequency counter to the winners of the two post-banquet "bug hunts," and several lucky banquet attendees won prizes from the *Christian Science Monitor*, including a Sangean MS103 receiver and speakers. For the full list of prize donations, see page 4 of the November *MT*.

A limited number of spots were available for a tour of Delta Airline's communications center down the street from the hotel. We thank Delta and Jean Baker for arranging the tours and we hope to be invited again! Probably all attendees listened to aero communications on one band or another; the view of the airport from the 15th floor listening post was inspirational. Unfortunately, it was not the best location for reception, although everyone enjoyed the opportunity to play with the Grove SDU and talk with engineer Chuck Morrison about its operation.

The Listening Post—equipped with the Grove SDU-100 Spectrum Display Unit and several receivers—gave attendees the chance to "see and hear" the action!

Did You Hear Us?

Another first for the convention was a live phone link-up with *Spectrum*'s radio magazine Saturday night via WWCR on 5810 kHz. Staff heard on the air included Bob Grove, Larry Van Horn, Rachel Baughn, Skip Arey, Jacques d'Avignon, Jim Frimmel, Bill Grove, Ken Reitz, and guest speaker Carole Perry! With all these personalities, there was scarcely time for questions, but we hope listeners caught the air of excitement.

If it sounds like this convention was something special, be sure not to miss the Fifth! The average attendance of 250 and the number of exhibitors can only be expected to grow. We fully anticipate an increased number of shortwave broadcasters to be represented next year, including some of your favorite U.S. stations, and even more of the *MT* staff writers will be on hand for this fifth anniversary. Mark your calendars now for the 21-23rd of October and join us for Five in '94 at the Atlanta Airport Hilton! MT

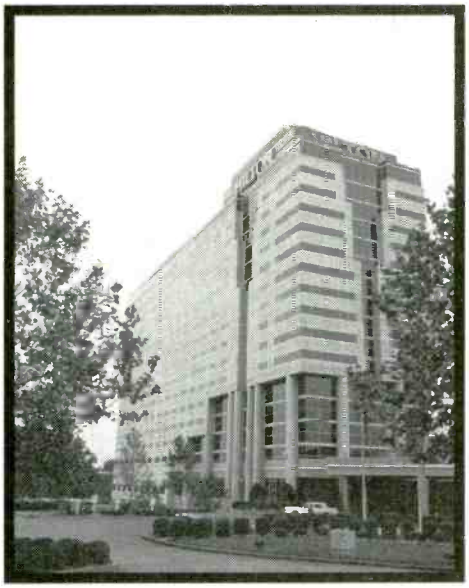
Turn the page for more highlights from Convention '93!

Drake honored the MT Convention with the premier of the desktop SW8 short-wave receiver.

Bob Grove welcomes an impressive panel of staff, speakers, and international broadcasters on opening night.

Delta communications staff gave MT tours a warm welcome.

Cellular Security doing on-the-spot mods at their booth.



Comfortable facilities, congenial staff, and built-in entertainment (Atlanta's international airport) make the Hilton our unanimous choice for next year!

MT's editor, Rachel Baughn, enjoys the opportunity to meet Frederica Dochinoiu of Radio Romania.

The two grand prize winners proudly display their R-7100s, donated by ICOM.

Excitement ran high at the opening session where topics ranged from how to legally sidestep federal attempts to restrict scanner coverage to how much shortwave broadcasters do or don't value listener response.

A wealth of information was to be had from exhibitors and seminars alike.

MT 1993 INDEX

Reprints of any article are available. Send $2 per article along with an SASE to: Monitoring Times Reprints, P.O. Box 98, Brasstown, NC 28902.

MAGNE TESTS
JAN Lowe's Compact SRX-50 Portable
FEB Casio Debuts with PR100 Portable
Giro's New R918 Portable
Yaesu's Tabletop FRG-100 Preview
Full Report on Lowe HF-150 Now Out
MAR Sangean AT606p
APR Grundig YB 205
MAY Yaesu FRG-100; The Little Radio That Could (With Help); $14.95 Radio
JUN Sony ICF-SW33
Revised "World Access Radio"
JUL Panda Digital Portable
Nothing further on World Access Radio
AUG Grundig's Yacht Boy 400
World Access/Electrola Tabletop Preview
SEP American Electrola DXC-100\World Access Radio 8A
OCT Sony ICF-SW77 Portable (Revised)
NOV Static Arrestors
DEC Sony ICF-SW30

ON THE HAM BANDS
JAN Batteries and Battery Packs
FEB PLA/NET—Environmental Radio
MAR Low Band DXing
APR Low Power Station Monitoring
MAY Satellite Communication
JUN Tracking Amateur Satellites
QRP Update
JUL Pasokon SSTV
The K4TWJ QRP Pen
FCC Visits 14.313
AUG Good Rigs at Low Cost
New All Band (160 thru 10) Meter Antenna
SEP Novice Activity
OCT DXCC
Extended Double Zepp
RS-15 (Radio Sputnik)
NOV Buying, Rejuvenating and Using Older Radios
DEC The Amateur Antenna

OUTER LIMITS
JAN WFIF-AM, National Vanguard Radio, Pirate Fax station, Voice of Broad Masses of Eritrea
FEB Romantic Space Radio, Somalia Clandestines, Korean Clandestine, 31 Meter Clandestines, Digital Pirates, He Man Radio vs. WLIS
MAR 1992 Breaks Pirate Activity Record, WMXN-FM Relay, Black Liberation Radio, European Pirates, Radio Free Bayonne
APR CCC Radio Creates Controversy RMI Clandestine QSLs, WMXN-FM Relay Busted, Voz de la Resistencia de Gallo Negro, Voice of the Khmer, Black Liberation Radio
MAY Europirates, Southern Music Radio Relays, Radio Policy, Radio N, Radio Peace in Action, Radio Caroline, CCC Radio Address Update, 1993 Worldwide Pirate Radio Logbook
JUN The Crowd on 41 Meters, USA Right Wing Clandestine QSLS, Korean Clandestine, Radio Caroline
JUL Anti-Castro Clandestines Jammed, Radio G'day from Australia, Haiti Clandestine
AUG VOA Using 7415 kHz, Cuban Jamming Update, California Free Radio
SEP Many Pirates Moving Near 7470 kHz, Europirate QSL'S, Check Out 6840 kHz
OCT Radio Brod Off Air, Then On Air, TV Marti Off, Brother Stair On?, Pirate TV?, Ernest Zundel, Ancient Clandestines, KIWI and DLR
NOV Pirate Radio Spanish QSOs Identified, TV Marti Blows It Again, Two Good Cuban Targets, Vatican Numbers QRM, WRMR Gets Publicity
DEC Cuban Clandestine Ratings Claimed, Jorge Mas and Cuban Pirates, Voice of Human Rights and Freedom for Iran, Europirates

PLANE TALK
FEB Radar
APR Shanwick Welcomes a DXer
JUN Keeping Out of Harm's Way (ATC radar)
AUG Flight software, microburst simulation, and more
OCT The Pilot's Perspective
DEC Selective Calling

PROGRAM SPOTLIGHT
JUNE International Broadcasts for Women
SEPT Music on the World Bands
DEC International Broadcasts on Books and Literature

RADIO REFLECTIONS
AUG The Information Age
(Smithsonian Radio Display)
NOV 1947 Zenith Transoceanic Model 8G005

READING RTTY
JAN The RTTY Decoder Olympics
FEB Korean RTTY
MAR A High Tech Story (new modes)
APR Hey, Bow Ties Are In
MAY Tuning in Facsimile *(last column)*

SATELLITE TV
JAN Low Cost Satellite TV Systems
FEB Direct Broadcast Satellite Update
MAR Small Dish and LNBF Update
APR A Ku-Band Primer
MAY The Mailman Cometh
JUN 1993 World Satellite Yearly
JUL HI-FI DXing via Satellite
AUG Radio Sweden's TVRO Guide
SEP Hi-Tech Changes in the TVRO World
OCT Those Astonishing Amateurs
NOV European Ku Band Viewing
DEC New Publications Review

SCANNER EQUIPMENT
JAN Realistic® PRO-39 Handheld Scanner
FEB Uniden Bear Tracker BCT2
MAR Uniden BC172XL
APR Realistic® PRO-46 Handheld Scanner
MAY Uniden Bearcat 700A Scanner
Cellular Restoration for the BC700A
JUN AOR AR33B
Scanner Sensitivity
JUL Uniden BC890XLT Scanner
AUG Realistic® PRO-44 Handheld Scanner
SEP Uniden BC2500XLT
OCT Yupiteru MVT-7100
NOV Uniden BC8500XLT Scanner
DEC Realistic® PRO-2028

SCANNING REPORT
JAN Antenna Tune-up
FEB Aircraft Radio
MAR Inside 911
APR Common Scanning Questions
MAY Public Service
JUN Vacation Fun
JUL Scanning the Weather
AUG Monitoring the PA Turnpike
SEP Invisible Antennas
OCT Scanning the Mounties
NOV Scanning the US Mail, UPS and Armored Trucks
DEC OptoElectronics Interceptor

UTILITY WORLD
JAN Ring out the Old, Ring in the New
New Aero Freqs
New Callsigns
Attention Aero Buffs
New Military
FEB Tracking Time
Restore Hope Update
Selscan Listening
Interesting Intercepts
MAR CFARS
14648.0 Identified
IBA Update
Medium Freq Coastal Radio Stations
APR Maritime Monitoring
Major US Coast Guard Change
NMF Broadcast Information
New Navy MARS Callsigns
MAY Ute QSLs
UVA Identified
Astrophysical Observatories
Government SSB Nets
Weather FAX Products
SRI Discontinues RTTY Service
WFLA AM-970 on HF
JUN You Want Beacons? Go Fish
RTTY-Decoders or PC?
JUL The Goldwing System
Blue Angels Flying High
German Ute Callsigns
Two New LDOC Stations on the Air
An Important New FAX Frequency
Aero USB-An Experiment
Red Cross Geneva Frequencies
FDLE Frequencies
AUG Major World Air Routes
Major World Air Routes Areas (MWARA)
NAVTEX for Capetown Radio
African Meteo Stations
SEP Good-Bye to ZLW
NMN Info
NAVTEX Broadcast
Facsimile Broadcast
HOKA Code 3-Round 21
KC-135 Tanker HF Bandplan
OCT Aero RTTY
Stettin Radio Frequencies
MAS Update
Offutt Radio Sites Visited
Coast Guard Cutter Update
NOV Intro to Utilities
Update on Yugoslavia Freqs
Netherlands Military Callsigns
USAF MARS Packet Network
DEC CW is Dead!
US Navy Call Signs
Shuttle Amateur Communications
Pot Luck Frequencies

WHAT'S NEW
Reviews:

CD-1 Decoder	March
Cellushield	June
Grove CVR4 Scanverter	Aug
Grove SDU-100 Spectrum Analyzer	Nov
ICOM GP-22 Position Locator	July
JPS NIR-10 Noise/Interference Unit	Feb
Junghans Mega RC Clock	Dec
MFJ Mobile Scanner Antenna	June
Millenium Rechargeable Battery	Aug
Nitelogger	Sept
OptoElectronics Interceptor	May
PRO-2006 Mobile Mount	April
Ramsey Speech Kit	Sept
Realistic® Amplified SW Antenna	July
Sangean Reel Out Antenna	May
SCA Capable FM Radio	April
Touchstone by EEsof	Jan
Universal M400 Decoder	Aug
WWV Format Clock	May

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**asterisk before/after time signifies station sign-on/sign-off;*
// means parallel; + means continuing but not monitored;
= 2 x indicates 2nd harmonic of following frequency.

AFGHANISTAN R. Afghanistan external heard on 4775 at 1400-1600 including English 1430-1500 (BBC Monitoring) Director of Afghan R. says transmitters nearly all destroyed, reception only possible in Kabul area (ORF *KW-Panorama* via Hans-Peter Tillman, British DX Club *Communication*) [non] RFE/RL Afghan service stopped Oct. 20 (R. Netherlands *Media Network*) Due to major U.S. cutbacks; see p. 68.

ALBANIA R. Tirana in Albanian to us at 0000-0430 on 11745v, 9760v, 6120v; English still 0130-0200 and 0230-0245 on 11840, 9580; but European services an hour later: 1530-1600 on 9760, 7155; 2300-2315 on 11825, 9760, 1395. SW frequencies vary up to 5 kHz. Fax +355-42-23650 (BBCM)

ARMENIA [non] Arax Radio Agency, Yerevan [believed via Russia/other CIS sites], autumn English announced or heard: 2244-2257 on 7440, 9705, 11920; 2343-2357 on 12010, 11920, 9685; 0344-0357 on 7105, 10344, 17605, 17690 (Brian Alexander, PA, *World of Radio*) 7105 is Samara, 17 and 17 Far East. Also 1945-2000 on 6065, 5930, 4990, 4810 (RVI *Radio World* via Steven Cline, Wolfgang Büschel)

AUSTRALIA Glenn Bartholomew indicated *Communicator* has been terminated as of Oct. 26. It's too much to hope that this clears the way for R. Australia to resume a genuine DX program covering SW (gh) Some more RA programs in new lineup which began in late August: *The Science Show*, Sat. 0910-1000. *Australia All Over*—outback life, Sun. 0910-1000 and 2110-2200. *Blacktracker*—Aboriginal music, Wed. 1330, 1730, Fri. 2330. *Book Reading*—Aussie novels, Sat. 0413, 0713, Sun. 0110, 0310. *Business Weekly*, Sat. 1130, 1530, Sun. 1930. *Fine Music Australia*, Sun. 1130, 1530. *Innovations*, Mon. 1130, 1530, 1930. *Music Deli*—from a variety of cultures, Fri. 1330, 1730, Sat. 0330. *Ockham's Razor*—sharp talk about science, Sat. 1010, 1210, 1410. *One World*—environmentalism Pacific, Sat. 0530, 0730, 1730, 1930. *Science File*, Wed. 1130, 1530, 1930. *Study in Australia*—opportunities for overseas students, Sat. 2210, Sun. 0010, 0210, 1010, 1210. *The Europeans*, Sun. 0130, 1330 (BDXC *Communication*)

Brisbane 9660 closes at yearend, Perth 9610 already gone (Marcel Rommerts, RN*MN*)

BELARUS R. Minsk has weekly English program, *Bible Focus Team*, Mons. 1945 on 7210; and via Ukraine on 6010, 7105 (TWR via Wolfgang Büschel)

BHUTAN BBS on 5030 ex-5025 still announced, very good until 1501* (Jorma Mantyla, Finland, via Ben Krepp, *Fine Tuning*) Now instead of Rebelde, Sarawak wipes 'em out, but caught BBS s/off at 1600 after Sarawak closed (Dave Valko, WA, *FT*) BBS silent Sunday.

BOLIVIA R. Nacional de Huanuni, 5964.75, *0906 in Spanish, Japanese, English; I recorded the new Japanese announcement for them. R. Ecología Internacional, 4441.23, in San Matías, 1215-1700 and 2100-2400 daily, sometimes until 0100 or 0200, lots of music requests and greetings in the evening; like many new SW stations in Amazon basin, uses HUCARR transmitter from La Paz company founded by Humberto Carrizal; this one is 300 watts, half-wave dipole. Visited new 4903.87 station, in Santa Ana del Yacuma, correct name is La Palabra, which was slogan of R. Cáritas, Paraguay, where Basque director Padre Yosu Arketa formerly worked; tiny 100 W-max transmitter, 10m high half-wave dipole, nom. 4903, sked 1200-1800 and 2100-0045 (Sun. 1200-1345 and 2300-0045) (Takayuki Inoue N., *Relámpago DX* via *RNM*)

R. Altiplano reactivated Oct. 1 after 22 months off, *1000 except Sunday on 5044.9 (Emilio Pedro Povrzenic, Argentina, *Latinoamérica DX*) R. Nueva América, 4795 at 0620 (Harold Buggins, UKOGBANI, BDXC) Should be easier now with 50 kW (Kevin O'Daly, BDXC ed.)

BRAZIL RNB, English to Europe *1755-1918* heard for three days on 15268.1 instead of 15265 (Brian Alexander, PA) Matched precisely by 15448.1 instead of 15445 to us at 1248 check! (gh, OK)

BULGARIA VOA W-93 schedule shows new site, "PLV," must be Plovdiv, for English to W. Africa, 215 degrees on 13675, 500 kW at 1800-1900, 15080 250 kW at 0600-0630 (via George Thurman, Bob Padula) Plovdiv 250 kW has Horizont home service 0500-0800 and 1000-1745, Sun. also 0800-1000, all on 9855. Varna 100 kW in Bulgarian on 5890 0300-0400, 1700-2000. Most R. Bulgaria frequencies are Povlidv except 100 kW Kostinbrod near Sofia on 5890, 7375, 9905, 11870; 6210 and 6220 either Kostinbrod or 150 kW Stolnik (R. Bulgaria via Büschel) New English 1330-1500 on 11630 to Far East (Büschel)

CAMBODIA National Voice of Cambodia, English news at 1200 including body counts on 11940.4, too close to Singapore; was better off using 11938v (Ralph Famularo, Japan, SPEEDX)

CANADA RCI finally shifted 0300-0400 from 6010 to 6000, also 9725, 9755, but Tue.-Sat. made it a service for Canadian forces around Haiti, English at 0330 (Bill Westenhaver, PQ) Cuba complained about 6010, but then put spurs on 6000, 6020 (George Thurman, IL)

Deteriorating state of other 6 MHz stations: 6005, CFCX is weak and difficult to hear even in Montreal daytime, format talk weekdays, country music weekends (Sheldon Harvey, PQ) No sign of CHNX, 6130, Halifax at 1200, had to listen to Laos instead (Dave Clark, Ont., *FT*) In early Oct., both Vancouver stations were not heard, CKFX 6080 and CKZU 6160 (Dave Valko, WA, *FT*) 6160 active except when they forget to turn it on (Terry Palmersheim, WA) 6030 Calgary IDs as *New Music Radio, Mix 1060*, mostly rock, at 0415-0439, first time heard in years and never so early (Rob Keeney, KS, *FT*)

CHINA Heilongjiang 5950 carries new Economic Broadcasting Station at 0400-1300 (Tetsuya Kondo et 2 al., R. Japan *Media Roundup*)

COLOMBIA Armonías del Caquetá reactivated on 4915 at 1215 but Brazil, Perú QRM (Santiago San Gil, Venezuela) in mid-Oct., clandestine R. Patria Libre until 1157* on 6270.12, until 0057* on 5910.1, both weak (Brian Alexander, PA)

COSTA RICA RFPI news: 30 kW on 7385 reached 15 kW by mid-Oct., Tue.-Sun. 0000-0800 only. Mounting log-periodic for other frequencies delayed by weather; suggestions welcomed for clear 9 MHz band frequency. 15030 transmitter is carrier-controlled, saving energy in pauses (*Mailbags*) AM moved to 7375, SSB to 7385.

CUBA R. Rebelde's experimental 3365 went off, still on 5025. RHC replacing 13660 with 9 MHz channel, 0200-0430 English (Arnie Coro, *DXers Unlimited*)

[non] Húber Matos, Jr., is charged by U.S. Attorney in Miami with Medicare and Medicaid fraud, laundering drug money. He is in Costa Rica, no hurry to return. Many rumors that CIA has cut off or cut back funding for his Voz del CID, and CID has been asking for donations to keep it on the air; also selling airtime to other exile groups (Jeff White, WRMI, *World of Radio*) Check 6305, 9942 while it lasts.

CZECHIA R. Prague at *0000-0030 on new 9405 and 5915, also 7345 (Brian Alexander, PA) and 9810, 5930, same five at 0300; 0100 on 9405, 7345, 5915; 0400 on all plus 13715 to ME/Africa (BBCM) New out-of-band 13590 at 0730, 13580 at 1630 (Büschel) 13580 with English at 1600, 1800; 9490 at 1800, 2100, 2200 (BBCM) Presently using two transmitters in Slovakia, from Jan. 1 R. Prague reduced costs by renting only one 250 kW at Rimavská Sobota (Oldrich Cip, R. Prague, RN

Media Network) R. Prague competed with two private stations, R. Rio and R. Metropolis to operate external service (RN*MN*)

DOMINICAN REPUBLIC HIAS, La Inconfundible Onda Musical, testing SW 4779.6, one day until 0301, another signing off at 2305*, very weak (Santiago San Gil, Venezuela, *W.O.R.*)

ECUADOR R. Calidad on 2899.87 at 1110, strong but terrible modulation, FM, presumably harmonic from Riobamba 1450 (Rich McVicar, *DX Partyline*) *On-Line*, European magazine on HCJB, Fri. 0700, 2130, 0400 to Americas. *El Mundo Futuro*, Tue. 0800, 1030, 1930, Wed. 0100, 0330, 0530 (HCJB *Program Notes*) Scientific credibility not improved (gh)

FINLAND YLE temporarily extended 11755 from 4 to 16 hours per day for Finns in Russia (BBCM) W-93 schedule showed it multi-targeted; no more evening English for us, Sunday 1430 cut to 25 mins.; features are: Sun., documentaries; Mon., *Business Monday*; Tue., Sports; Wed., *Environment Report*; Thu., *Finnish History*; Fri., Highlights; Sat., *Capital Coffeebreak*, Finnish language course. Add another country on 13 MHz—13770 at 0930-1000, 1100-1200 to East Asia. English at 2230 on 9615 to Europe, Africa, Asia, S. America (via Gigi Lytle, TX)

FRANCE RFI expanded our English to one hour from 1200 on 15365, 21645 (Bill Westenhaver, PQ)

GABON Africa Numéro Un, 15475 and 9580 have English news 1851-1855 but not on Saturday (Brian Alexander, PA)

GERMANY Deutsche Welle has to cut 350 jobs and several languages by 1996. These must justify existence with audience numbers: Scandinavian, Dutch, French, Italian, Greek, Japanese; on two-year test at reduced schedule are Slovak, Czech, Slovene, Hungarian, Albanian, Dari, Pashto; English, other AfroAsian languages continue (DW spokesman on RN*MN*) German expands from 4- to 8-hour cycles (BBCM)

HAWAII KWHR, Naalehu, will be on by Dec. 24 if at all possible with special inaugural program (Joe Hill, WHRI) Authorized 24-hour schedule: 0000 on 17555, 0200 on 17510, 0600 on 9930, 1600 on 7425, 1800 on 13625, 2000 on 13720, 2200 on 17510 (George Jacobs via WHRI)

HONDURAS R. Copán International, 15675, Mon.-Sat. 1400-1500, 2100-2300, Sun. 2100-2200, but ending time of 2100 broadcast varies; new color QSL cards of Mayan ruins, report to R. Miami, 8500 SW 8th St., Suite 252, Miami, FL 33144 (Jeff White, via Gigi Lytle)

HUNGARY RFI Paris planned to cease relay here as of Nov. 20 (Wolfgang Büschel) R. Budapest should be back at 2200 and 0300 for winter, contrary to printed schedule; some topics: Thurs., repeated Suns., *Discovering Hungary*—Nov. 26, Courtyards; Dec. 2, Country Ways; Dec. 9, The Big City; Dec. 16, Budapest's Rural Population; Dec. 23, New Fields. Mons. rep. Fris., *Green Talk*—Nov. 29, New Environmental Code. Tues. rep. Sats., *Choices*, People and Events of '93—Nov. 30, The Media; Dec. 7, The Economy; Dec. 14, Publishing. Thu., Dec. 2, *Animals Across the Border*. Thu., Dec. 23, *Money Monthly*. Fri., Dec. 24, *Christmas Readings, Days Around the World*—the lonely sailor. Sat. Dec. 25, *Music for the Season*: Hungarian Mass. Sun., Dec. 26, *A Year of Jazz*. Tue., Dec. 28, personal choices of staff members. (via John Carson)

ICELAND INBS, daily in Icelandic: 1215-1300 on 13835, 15770; 1410-1440 on 13855, 15770; 1855-1930 on 11550, 13855; 1935-2010 on 13855, 15770; 2300-2335 on 11402, 13855 (Jari Perkiomaki, Finland, *USENET* via George Thurman)

INDONESIA RRI Pekanbaru on 5040 ex-5985 to 1515* (A. Yoshida and Y. Kato, RJ*MR*) Also here to 1515*, tho sked 0930-1600 per David Foster via Andy Sennitt; Jayapura 5045 and Yogyakarta 5046 both inactive (Bruce MacGibbon, OR, RJ*MR*)

IRAN [non] V. of Human Rights and Freedom, via Egypt, at 0645-0730 on new 15145 ex-11470, // 15100 and much stronger 15670, all heavily jammed (Wolfgang Büschel, Germany) V. of the Movement of the Mojahedin of Iranian Baluchistan (Persian: *Jonbesh-e Mojahedin-e Baluchestan Iran-e Tabari*), believed from Iraq with Baghdad address, 0600-0745 and 1300-1430 daily in Baluchi on 15340; also mentions 21 meter band; previously used 11970, 9545, 7250, 7180 (BBCM)

IRAQ [non] V. of the Iraq People announced 15135, 13670, 15235, 9980, 15580 (BBCM) Tentatively this in Arabic, brief classical music at 1910-1935 on 13670, 15135, 9569, all weak (Brian Alexander, PA)

IRELAND [non?] A petition campaign calls for a SW service, perhaps a 10 kW transmitter satellite-fed in eastern Canada, or lease another station cheap (HCJB *DX Partyline*)

ITALY AWR Forlì is running only 2.5 kW and weather knocked it off the air for two weeks. Purchased estate in Italy for its own 250 kW site, but no license yet from government. Would prefer to have its own station; not satisfied with Russian frequency selection and unreliability of tape playbacks (AWR Germany via Büschel) Finn Krone's DSWCI DX program on AWR stopped without notice Oct. 3 as English program production moved to England (Krone, DSWCI via Büschel) May come back on a different AWR Europe outlet (RN*MN*)

NEXUS-IBA, 7125, mailbag program *Hello There* airs first Sat. 1600, repeats Sun. 0600, 0715, 0815, 1430, Mon. 0215, 0615, 0715, 1900, Fri. 0215, 0700, 1230, 1900, Sat. 0215, 0615, 0815 (Alfredo E. Cotroneo, NEXUS, *SWL List* via Will Martin) Contrary to press info from Ernst Zündel, his German *Voice of Freedom* will *not* be carried on NEXUS-IBA, which does not accept programming promoting racism or violence (Cotroneo, *USENET*, via Patrick Crumhorn, TX)

JORDAN Seldom-heard R. Jordan actually audible on 9560 in English news at 1600, 1700 in mid-Oct. (Tom Sundstrom, NJ, FIDONET *SW Echo* via Thurman) Scheduled 1200-1300 and 1500-1730 (Jari Perkiomaki, Finland, *USENET* via Thurman)

KASHMIR AZAD A 100 kW SW transmitter is a top priority for Azad Kashmir Radio, at Mirpur; Pakistani Broadcasting Minister Nisar Memon laid foundation stone (R. Pakistan via BBCM)

KOREA SOUTH Clandestines for the North: Echo of Hope, 2000-2100, 0800-1200, 1400-1700 on 3985; 2300-0100, 0300-0700 on 6348. V. of the People, 1500-1630, 2000-2130, 0900-1030, 1200-1330 on 3912; 2300-0030, 0300-0430, 0600-0730 on 6600; at 2300 and 0300 also on unannounced 6518 (A. Osuka and T. Yamashita, RJ*MR*)

LITHUANIA Radiocentras, commercial in Vilnius, announced in English at 1930: on 9400, LSB, 5 kW, 250°, QSL for 3 IRCs to Box 1792, time for rent, fax 370-2-612800. Was on the air almost continuously in Lithuanian, breaking every half hour for such announcements in English, German (BBCM)

MEXICO R. Educación, 6185, 0000-0800 now separate from MW, programs for abroad, English announcements, Italian, planned French, German (Harald Kuhl, México, *Play-DX*) Haven't found any regular English programs, just announcements at odd times along with Spanish. Still noted with domestic service at 1200 check (gh, NM)

MONGOLIA RUB announced English schedule, Mon., Thu., Sat. at 0910-0940 and 1200-1230 on 12015, 11850; 1445-1515 on 7780, 7260; 1940-2010 on 11850, 11790; best here at 0910 on 12015, sometimes 11850 (David Norcross, Guam, *W.O.R.*)

MOZAMBIQUE [non] V. de RENAMO "life from Mozambique" now via Swaziland 6155 at 0400-0500, 1600-1700 (BBCM via RN*MN*)

NETHERLANDS RN to be reorganized in Jan. or Feb., keeping English, Spanish, Portuguese, Dutch but some other languages going

off; budget stays at $43 million, but more emphasis on Europe, world's undeveloped media areas; less SW, more local re-broadcast in some areas (RN*MN*) Dec. previews: *Mirror Images*, Tues., on Amsterdam Documentary Film Festival. *Marks on Mechanics* encores Weds. 0150, 0850, 1050, 1250, 1450, 1850, 2350—clocks, carillons, player pianos, early phonographs, jukeboxes. *Sounds Interesting*, Sat. Dec. 4 on fish, fowl, meat, vegetarian entrées, 0750, 0950, 1150, 1350, 1550, 1850, Sun. 0050, 0350. Wed. documentaries: Dec. 1, Dutch roots in Brooklyn; Dec. 8, ghettos; Dec. 15 and 22, emergency services (via Diane Mauer, Will Martin, Frank Orcutt, Gigi Lytle)

NEW ZEALAND R. for the Print Disabled, ZLXA, Levin, Sun.-Thu. *1900-0900* Mon.-Fri.; Sun. 0500-0800 on 3935; 7290 until 0600* weekdays. *CQ Pacific*, Mon. 0800 (Arthur Cushen, RNZI *Mailbox*) Diabolical propagation prompts assignment of third SW frequency, 5960, should be on soon, check around 0600, special QSL for reports to Box 360 (ZLXA Director, *ibid.*)

RNZI resumed 11735 instead of 9550, Sat. and Sun. only at 1850-2137 (Adrian Sainsbury, RNZI via Ed Evans, WSHB, USENET via Thurman) *Travel South* for prospective visitors to South Island, Tues. 0630 on 15120, 1010 on 9700, 1705 and 2115 on 9550. NZ and Pacific five-day weather forecasts, 2335 daily on 15120; outlooks also after the 0700 Mon.-Fri. news on 9700. Program previews, *What's On*, 1755 Mon.-Fri., 2015 Mon.-Thu., 1050 Mon., Wed., Fri. (RNZI)

PERÚ R. Marañón, 4834.9, reactivated at *1000 to *Chariots of Fire* (Hans Johnson, MD and Dave Valko, PA, *FT*) R. Mundo, Cuzco, "voz campesina," on 5046 ex-5082.6 at 1015-1045 (Fernando Viloria, Venezuela via Santiago San Gil) R. Atlántida, 4789.9, has tourist program *Trocha Turística* Sat. and Sun. 2300 starting with English ID

CEMCOS
Radio Madre de Dios
PUERTO MALDONADO - PERU

(San Gil, Venezuela) R. Madre de Dios, 4950, has program for worldwide DXers, *Festival de Música Internacional*, mailbag and playing music sent in by listeners, Suns. 0100-0200 [UT Mons.?]. Host/producer Alcides Arguedas Márquez had an accident breaking bones, causing his program to be suspended while he is hospitalized. We don't have funds for his treatment and hope to raise $2000 from listeners. Please help us: Radio Madre de Dios, Campaña de Solidaridad, Apdo. Postal 37, Puerto Maldonado, Perú (letter dated Aug. 31 via Santiago San Gil, Venezuela)

R. Nacional, Lima, 6095.0 reactivated after 10-year break, heard at 0200 (Emilio PedroPovrzenic, Argentina) 6095.1, about 10 kW, steady, morning and night (Henrik Klemetz, Colombia, *Play-DX*) good here to 0500*, 10 kW? (Harald Kuhl, Mexico City, *ibid.*)

PHILIPPINES R. Veritas Asia now using 22m, 13555 at 1535-1600 Urdu (KSDA via Büschel)

RUSSIA Dr. Gene Scott via Novosibirsk: 0400-0800 21845, 0030-1100 12040, 1130-1600 6070, 2200-2400 6120. KNLS Chinese via Novosibirsk, Fri., Sat., Sun. 1300-1500 on new 6080. CRI in English via Russia 2200-2257 on 7315 (KSDA via Büschel) R. Tsentr, 1630-1700 on new 7170 (Anatoly S. Klepov, *DX Moscow* via *Play-DX*) Arkhangelsk daytimes on 6160 ex-5015 (Olle Alm, Sweden, *SWB* via *Play-DX*)

SA'UDI ARABIA For S93, Riyadh deleted English and French from SW external services (Bob Padula, *ADXN*) Was rarely heard, 1600-2100 English on 9705 (gh)

SERBIA [non] R. Yugoslavia for D-93: 1330 on 11835, 1930 on 6100, 17710, 2200 on 6100, 6185; to us 0100 and 0200 on 6190 (Andy Sennitt, RN*MN*)

SHRI LANKA To counter Catholic and local resident protests over new VOA station, Minister who introduced agreement said it provides that "U.S. will use its best endeavors not to broadcast any programs detrimental to the national interests of Shri Lanka." (Reuter via Bill Dymond) Bound to conflict with journalistic freedom—VOA no doubt makes similar concessions to other countries to get relays (gh)

SLOVAKIA R. Slovakia International, 81290 Bratislava, Mytna, c.1, complete: to Europe, 1300-1327 Russian 13715, 13580, 11990, 9485; 1330-1357 German 11990, 9505, 7345, 6055; 1400-1457 Slovak including Mon.-Fri. repeat of 1100-1200 domestic service, on same. 1830 Russian, 1900 Slovak, 1930 English, 2000 German, 2030-2057 French all on 9440, 7345, 5915. These shift one hour earlier during DST; not shifting are the following. To America, 0100 English, 0130 Slovak (also on 9440), 0200-0227 French all on 9810, 7310, 5930. Australia, English 0830, Slovak 0900-0927 on 21705, 17535, 15605, 11990. Some are via Czechia (BBCM)

SWITZERLAND At least during winter, SRI resumed repeating previous UT day programs not only on 0100 broadcast but finally at 0400 to us, instead of starting new day for Europe (Joel Rubin, CA) Saturday program *Grapevine* plans Xmas special, holiday stories, customs by tape or letter from listeners, also inviting music requests (gh)

TAIWAN VOFC features in middle of hours, UT days on 0200, 0700, 2200, next day 0300; Sun., *Main Roads and Byways, Mailbag Time*; Mon., *Jade Bells and Bamboo Pipes*; Tue., *Kaleidoscope, Taiwan Economic Journal*; Wed., *Music Box*. Thu., *Perspectives, Journey into Chinese Culture*; Fri., *People, New Record Time*; Sat., *Reflections, Jade's Kitchen* (via Gigi Lytle, TX)

TAJIKISTAN [non] V. of Free Tajikistan, new clandestine pro-Iranian, anti-Communist on 7088v, 0700-0730, 0900-0930 (BBCM via RN*MN*)

TONGA R. Tonga, 5030, off air due to link problems from studio, unknown when or if will be back (Marcel Rommerts, Tonga, DSWCI *SW News*) See BHUTAN

UKOGBANI APR stations are pressuring BBC to adopt "constant local time" for convenience of relayers, i.e. make one-hour shifts with American DST (via Jim Wishner, MN) Let's hope this tail doesn't wag the entire BBC SW dog!

WORLD HARVEST RADIO INTERNATIONAL

USA *World of Radio* is now scheduled: on WWCR, Fri. 2215 on 15685, Sat. 0730 on 7435, 2130 on 15610, Sun. 0415 on 7435, 0700 on 5810, Mon. 0000 on 7435, Tue. 1330 on 15685; on WHRI, Sat. 0130 on 7315, 0600 on 7315, 9495, Sun. 0130 on 7315, Mon. 0100 on 9495, Wed. 1900 on 13760. WWCR-3, 12160, schedules *The Big Backyard*, from Australian Embassy, Sun. 2330 (gh)

WEWN decided to use only three transmitters, the fourth on standby (WEWN frequency manager via Mick Ogrizek, *ADXN*) Stronger from mid-Oct., running 450-500 instead of 300-400 kW (George Thurman, IL) WS of CSM went to less cumbersome name, Monitor Radio International (via Jim Moats, OH) Possible buyer for WCSN is Adventist World Radio, which inspected the station (Rich McVicar, *DXPL*) WRMI, 9955, in English and Spanish includes Latin American music, DX news, 7-week series *Around the World with Marcel Rommerts*, other travel programs (via Gigi Lytle, TX) La Voz de la OEA obviously doesn't monitor itself, announcing wrong 9560 instead of 9565 for years, now two wrong with 11830 shifted to 11835, but still on 15160 for 2345-2430 broadcast (gh) WVHI, 1330, Evansville, IN, has application for SW; VP and CE is Ralph Turpen, not Ronald Yoder (J.D. Stephens, AL)

UZBEKISTAN Tashkent home service, lovely local music, 0400-1400 on 15330, 15165 (Büschel) English 1200 and 1330 back on 17745, new 15420 (BBCM German DX, RVI via Büschel)

VENEZUELA R. Occidente, Tovar, reactivated 9750 after several years, very strong 1700-1800+ (Santiago San Gil, Venezuela)

TNVN

VIETNAM RVOV is running contest "What do you know about Vietnam?"—answer three questions, postmark deadline Dec. 31, first prize 5 megadong, more megadong in second and third prizes; listen for details, appropriate answers (via Gigi Lytle, TX) May Americans convert "enemy" megadong?

YEMEN Sana'a, 9780v, has new English service around 2105-2140 (Brian Alexander, PA)

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.*

0044 UTC on 11790
IRAN: VOIRI. English national newscast to topics on Yeltsin, UN, and Libya. Arabic vocals to "this is the Voice of Iran in Teheran." Two political commentaries. // 9022 poor, // 15260 not heard. (Tom Banks, Dallas, TX; Giovanni Serra, Rome, Italy)

0055 UTC on 9810
SLOVAKIA: Radio Slovakia Intl. Station sign-on to "this is Bratslavia; you are listening to Slovakia." Frequency quote to national newscast. *Back Page News* segment on tourism, Slovak recipes, and medical updates. (Thomas S. Barnes, Marietta, GA) Station monitored 0111 on 5930//7310 kHz with music to *Slovak Daily Front Page Review.* (Serra, Italy)

0122 UTC on 7465
PIRATE: Romantic Space Radio. Echo effect announcements. Electronic music to announcer's comment of program being relayed via an American pirate station (unknown which one). (Harold Frodge, Midland, MI)

0123 UTC on 11820
SWEDEN: Radio Sweden. Swedish newspaper editorial comments. Pop music, and announcer chat to interval signal. Station ID in Swedish to sign-off 0130 // 9695 kHz. (Serra, Italy)

0123 UTC on 4825
BRAZIL: Radio Cancas Nova. Portuguese. Pop music to lively DJ announcer. Brazil's Radio Educacao Rural noted on 4755 kHz, 2344 UTC, with local commercials and Braz pops. (Maywoods DX Team: Ed Shaw. Jim McClure, Wayne Gregory, Chuck Everman, Jerry Johnson, John Hafendorfer, Loy Lee, and "special guest from the outskirts of Atlanta"—Mr. Jerry Lineback!) *My special thanks to this dynamic DX Team...always a pleasure to receive your logs!—GVH*

0124 UTC on 4835
GUATEMALA: Radio Tezulutan. Spanish. Music to ID at 0127. Lady announcer's GREAT local marimba music. La Voz de Nahuala noted on 3360 kHz at 1103. Low modulation for local music and "Nahuala" ID. (Maywoods DX Team, KY)

0125 UTC on 6085
GERMANY: Deutsche Welle. *European Journal* to 0145. Station promo, ID/frequency quote, to info on receiving publication, *Tune-In.* Toll free DW phone number for all 50 U.S. states, 1-800-392-3248. (Frank Hillton, Charleston, SC) DW monitored 0214 on 7285 kHz, with news on Pakistan and India. (Bailey, AR) Program on German compositions on 6145 kHz, 0312. (Maywoods DX Team, KY; Don Taylor, Green Cove Springs, FL)

0158 UTC on 9510
ROMANIA: Radio Romania Intl. Interval signal to sign-on ID/frequency schedule. International news topics of the Middle East, to chat on Romanian language // 11940, 11830, 6155 kHz. (Serra, Italy) Audible on 9510 kHz, 0243-0300. IDs and programming from Frederica Dochinoiu. (Banks, TX)

0214 UTC on 9835
HUNGARY: Radio Budapest. Discussion on airlines to station ID. National folk music on // 11910. (Serra, Italy)

0246 UTC on 11710
ARGENTINA: Radio Nacional/RAE. Spanish. Lady's station ID. Orchestra music to Spanish ID at 0257. (Maywoods DX Team, KY)

0250 UTC on 5950
TAIWAN: Voice of Free China. Chinese language lesson program. (Kelly Bailey, Midland, AR) Taiwan's BC Corp monitored in Chinese at 0545 UTC, 11885 kHz. Asian instrumentals to commercial breaks. Time-tips to ID 0600. Announcer duo. (Jerry Witham, Keaau, HI)

0335 UTC on 6095
PERU: Radio Nacional. Spanish. Lively Andean music to ID breaks, "Radio Nacional." Full ID at 0400. Peru's Radio Del Pacifico audible on 4975 kHz, 0445 UTC. Religious music to commercials and ID 0500. Traditional Andean music. (Witham, HI)

0340 UTC on 9380
GREECE: Voice of Greece. Newscast topics of Greece, the Mediterranean, and Balkans, deportation of 4,000 illegal Albanian immigrants from Greece. (Witham, HI) VO Greece monitored to 0350 on // 9420, 11645 kHz, national news, IDs, and Greek folk music. (Banks, TX) VOA's Kavala relay heard in Serbian at 0400, 11805 kHz, English IDs. (Maywoods DX Team, KY)

0405 UTC on 3995
SOUTH AFRICA: Channel Africa. International and regional news to rooster sound effects and wake-up music. *Dateline Africa* promo to 0415, // signal on 7230 kHz. (Witham, HI) Station noted at 0404 0427 on 9730 kHz. (Barnes, GA; Banks, TX)

0415 UTC on 4855
MOZAMBIQUE: Radio Mocambique. Portuguese. Male DJ's pop music show. Female's African vernacular dialect news at 0430. Weak signal with interference. (Witham, HI)

0450 UTC on 11680
CHINA: China Radio Intl. Feature on the Great Wall of China to musical interlude. China's inland water system discussed to *Listener Letterbox* program. (Kris Bowen, Livingston, NJ) *Music Album* for Olympics 2000. (Bob Fraser, Cohasset, MA)

0508 UTC on 11954.8
ANGOLA: Emissora Provincial de Benguela. Portuguese. African pop vocals at tune-in with signal peaks (S7-8) by 0510. Musical promo for "Radio Nacional" ID. Phone-in news item from Nacional reporter to local commercial. Additional station promos (with echo effects). Portuguese pop vocals to news briefs at 0520. No sign of // 5043 kHz. (GVH/NC)

0518 UTC on 9700
BULGARIA: Radio Sofia. Editorial on Russia's political scene. (Bowne, NJ) Report on Bulgaria's politics, 2017, 15330 kHz. (Fraser, MA) Bulgarian news 0302, 11765 kHz. (Maywoods DX Team, KY; Banks, TX)

0600 UTC on 4930
NAMIBIA: NBC. National news to international update. Auto insurance commercial to "Namibia National Radio" promo as "Non stop entertainment." Pop tunes to weather report at 0615 // 4965 kHz. Vocals and IDs at 0143, 3290 kHz. (Maywoods DX Team)

0700 UTC on 6160
CANADA: CKZU-CBU, Vancouver. CBC news of Canada and U.S. to 0715. Station promo to Frans Krommer music. (Witham, HI)

0705 UTC on 6518
SOUTH Korea: Voice of the People. Korean. Announcer to Chopin interlude. Serious text, using *Entry of the Gladiators* march to emphasize her point! //6600 kHz, however 6518 kHz was the stronger signal, easily over-powering jamming. (Witham, HI)

0728 UTC on 3316
SIERRA LEONE: SLBS. Low modulation for male's English political speech. (Maywoods DX Team, KY) *Nice... SLBS not reported often—GVH.*

1035 UTC on 4753
INDONESIA: RRI-Ujung Padang. Indonesian. Indo pop music to regional announcer. Indo's RRI-Jambi heard on 4925 kHz at 1133 1149. (Manuel Rodriquez Lanza, Caracus, Venezuela) *Welcome to MT!—GVH.* Indo's RRI-Samarinda heard on 9614.4 kHz at 1135 UTC. (Maywoods DX Team)

1124 UTC on 4810
PERU: Radio San Martin. Spanish. Monitored to 1138 UTC, with talk, ID and music. Audible this frequency 2303-2353 UTC with salsa music, ads, and ID as; "continuamos con esta tarde de recuerdos por San Martin..." (Lanza, Venezuela)

1125 UTC on 2310
AUSTRALIA: VL8A-Alice Springs. Country and western tunes to English talk and IDs. Aussie VL8T-Tennant Creek audible on 2325 kHz, 1127 with // programming. (Maywoods DX Team, KY)

1132 UTC on 4890
PAPUA NEW GUINEA: (Papua Terr.)NBC. Pop music, local English time-check to ID. *Concert Hall* program. Additional PNGs: Radio Milne Bay (Papua Terr) on 3365 kHz, 1151 in Pidgin, Radio Western Highlands (New Guinea) on 3375 kHz, 1145 in Pidgin, and Radio New Ireland (New Ireland) on 3905 kHz, 1156 with c&w music and English text. (Maywoods DX Team, KY)

1510 UTC on 17500
TUNISIA: RTV-Tunisienne. Very good signal for Arabic music and talk. Station audible on 11550 kHz at 1756, and 7475 kHz at 2108. Arabic music, and "Tunisia" ID. (Maywoods DX Team, KY) TRV audible in Arabic on 11550 kHz at 1115. (Serra, Italy)

1725 UTC on 11520
SAUDI ARABIA (non): The National Radio for the Democratic Arab Saharan Republic. Presumed Arabic. Carrier hum audible 1718 UTC. Off at 1720, resuming at 1725, with hum and music heard. Brief announcement at 1728, to nationalistic music. Abrupt cut off for newscast. Strong signal, hum and distortion throughout. (Witham, HI) *Nice log, Jerry—GVH.*

1759 UTC on 9165
SUDAN: Radio Omdurman. Arabic music, time pips at 1800. Station ID, "the English service of the Sudan National Broadcasting Corporation." National anthem, newscast and political commentary. (Serra, Italy)

2009 UTC on 12085
SYRIA: Radio Damascus. Arabic music, station ID and national anthem. Recitations heard on // 15095 kHz. (Serra, Italy)

2012 UTC on 11585
ISRAEL: Kol Israel. *Israeli Mosaic* discussion on the economy of a separate state of Palestine. (Fraser, MA) Hebrew service heard on 17454 kHz at 1158. (Serra, Italy)

2138 UTC on 7425
PIRATE: Voice of Laryngitis. Macabre ad for Freddie's Dead Bodies for Science. FCC Investigator Eager Beaver program, blasted by WEWN sign-on 2158 UTC. (Frodge, MI)

Utility World

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CW is Dead!

Since this is the last column of the year, let's take a moment to reflect on the big utility band story of 1993: the death of CW.

Well, a little premature, perhaps, but the days of CW are numbered.

Throughout the shortwave radio spectrum, CW (Morse code) is being replaced by more efficient means of communication. One only has to look at loggings in these pages over the last six years to see the decline of the grand old language of radio communications.

Samuel F.B. Morse, the inventor of Morse code, was somewhat of a renaissance man: he was a noted 19th century painter and political essayist, and the founding member of the nativism movement against immigration.

Early in life, he became intrigued with the idea of sending messages using electrical current. Morse persuaded Congress to finance the first telegraph line and on May 24, 1844, Morse tapped out his first CW message, "What hath God wrought." Morse got rich and by the mid-1850's, the United States had 23,000 miles of telegraph line.

For years, Morse code was used not only by the railroads, but it was also the language of the oceans. Ships at sea and the Coast Guard turned to CW after the turn of the century when the wireless came into use.

Ever since the *Titanic* sank in 1912, the Coast Guard and other stations around the world have monitored the 500 kHz international distress and calling frequency for ships in distress.

On July 31, 1993, that practice stopped. Traffic on 500 kHz had dropped dramatically in recent years. One Coast Guard spokesman said, "Satellite links, marine telephones and computers pushed out Morse code."

"As we conclude our watch on 500 kHz, we wish the maritime community fair winds and following seas," the Coast Guard said in a final Morse code message. "From all Coast Guard radiomen, we bid you 73 (best regards)."

Now it appears that CW is destined to be the Latin of the communications world. Ships are no longer required to carry Morse code proficient operators. The Boy Scouts no longer require CW to earn the first class rank. Morse code is no longer taught in the Coast Guard and the US Navy stopped teaching surface ship radiomen Morse code in 1988. One Pentagon spokesman says that CW aboard submarines is even being phased out. Military stations in Canada are also phasing out CW broadcasts.

One of the hottest debates in the amateur radio community today is whether CW should be abolished for ham tests. Discussions and editorial comment have already surfaced on whether amateurs in this country should support initiatives by other countries to remove the international regulation regarding CW proficiency at the next ITU Plenary radio conference.

The current ITU regulation requires:

> "Any person seeking a license to operate the apparatus of an amateur station shall prove that he is able to send correctly by hand and to receive correctly by ear texts in Morse code signals. The administrations concerned may, however, waive this requirement in the case of stations making use exclusively of frequencies above 30 MHz."

No doubt there will be fierce debate in amateur journals and on the air regarding the demise of this regulation. Opposition from older hams will be strong, but I believe it is inevitable that the amateur radio CW proficiency requirement will die at the next World Administrative Radio Conference (WARC).

Certainly on the maritime bands, the demise of Morse code now appears to be in full stride in the maritime bands. As a result of a previous mobile maritime WARC, spectrum space for Morse code in the maritime bands was decreased in July 1992. The spectrum space that belonged to CW was turned over primarily to more efficient digital modes of communication. Even the maritime radio telephone spectrum was reorganized to give these digital modes more frequency space.

Several marine stations that specialized in CW communications to ships have folded. Others will follow in the near future. Maritime stations like ZLO in Wellington, New Zealand, and others have closed their doors due to HF inactivity and the decline of Morse code. Satellites and modes like SITOR-A/B have eliminated the need for these stations.

Maritime station KLB-Seattle Radio, WA, is only one example in this country of CW's declining impact. The station is only open for 16 hours a day.

"Some ships, especially foreign vessels, still use Morse code," said Chris Larsen, one of the owners of KLB. "Ships that haven't converted to satellite communications because it's too expensive still use Morse code," he said.

Even that use is fading. Not long ago there were four stations on the US West Coast. Now there are three: KLB-Seattle and KFS/KPH in the San Francisco area. There have been similar results on the East Coast of the United States.

Now that I have dusted off the crystal ball, maybe it's time you look at putting a few CW-only radio stations in your log book. A QSL from one of these stations may put a piece of history on your wall.

US Navy Call Signs

From time to time, I see logs for tactical calls being used by US Navy aircraft carriers. These calls have started showing up on even non-Navy channels, especially on US Air Force frequencies. Recently, I was asked to compile a list of known call signs and here are the results.

USS Forrestal (CV-59)	Handbook
USS Saratoga (CV-60)	Fairfield
USS Ranger (CV-61)	Gray Eagle
USS Independence (CV-62)	Gun Train
USS Kitty Hawk (CV-63)	Panther
USS Constellation (CV-64)	War Chief
USS Enterprise (CVN-65)	Climax
USS America (CV-66)	Courage
USS John F. Kennedy (CV-67)	Eagle Cliff
USS Nimitz (CVN-68)	Old Salt
USS Dwight D. Eisenhower (CVN-69)	Call unknown
USS Carl Vinson (CVN-70)	Gold Eagle
USS Theodore Roosevelt (CVN-71)	Call unknown
USS Abraham Lincoln (CVN-72)	Union/Eclipse (Have seen both listed)
USS George Washington (CVN-73)	Call Unknown
USS John C. Stennis (CVN-74)	Not yet commissioned
USS United States (CVN-75)	Not yet commissioned

Anyone that can help with tac calls for the *Ike, Roosevelt* or *Washington* or any other fleet units, please drop me a line here at

Brasstown. Updates will be published as information becomes available.

Shuttle Amateur Comms

Every time the shuttle goes up, our phones here in Brasstown ring off the hook. Folks want to know, "How can I hear the shuttle on my shortwave?"

First don't expect to hear direct shuttle comms. They utilize frequencies in the 2 GHz range and these are broadcasted digitally. Not too many places have off-the-shelf equipment to hear those higher frequency signals.

A much easier alternative is to monitor shuttle air to ground comms via WA3NAN, the amateur radio club station at the Goddard Space Flight Center. These very nice folks have been volunteering their time for this service for quite a few years now. I always tune into their signal when I'm in the listening post during a mission. When the shuttle is up, you can catch air-to-ground comms when the shuttle is up on the following frequencies:

3860 and 7185 kHz LSB
14295, 21390 and 28650 kHz USB

Look for the 3 and 7 MHz frequencies during the evening and nighttime hours here in the US, and the 14, 21, 28 MHz frequencies during daylight hours.

To our friends at the Goddard Space Flight Center Amateur Radio club, Utility World sends a Bravo Zulu (job well done) for the service they have rendered and continue to provide to amateur and shortwave communities.

Shortwave Broadcaster Blasts NASA!

I hope a few of you caught our live segment from the MT Convention in Atlanta this year over WWCR-Nashville courtesy of the shortwave communications magazine of the air, *Spectrum*. Several *MT* staffers, including this editor, have been on the *Spectrum* show with Mark Emanuel and Dave Marthouse in the past. So the invitation to get as many of *MT* staff as possible on the air was only natural.

After arrangements were set up with the *Spectrum* staff, I informed Bob Grove so he could make an announcement to the convention to tune in. Once I told Bob the frequency the program was on, he questioned the wisdom of WWCR's choice in out-of-band shortwave broadcast frequencies. How right he was!

By now I known you may be a bit confused, so maybe the following log from Richard Baker in Ohio will explain what I mean:

> NFXM-*USS MacInerney* (FFG-8) calling Cape Radio. Cape Radio calling *MacInerney* at 2034. At 2105, both make contact, as 5810 is a manned space program primary frequency. At 0000, WWCR in Nashville comes up on same frequency and stops all communications. Was in support of a shuttle launch. Upper Side Band mode used by NASA.

WWCR was quite surprised, to say the least, when I let them know whose frequency they were broadcasting on. In the station's defense, they had been checking the frequency for quite some time before they applied to the FCC for approval to transmit on 5810. And sure enough, the FCC gave WWCR their blessing to be on 5810! Makes you wonder if the right hand ever talks to the left one.

Tune in *Spectrum* on Sunday mornings UTC at 0200 (Saturday 9 EST) on their current frequency of 5810 kHz. Be sure to watch for a frequency change in the near future!

Ute World's Pot Luck Frequencies

Over the last several months, contributors to this column have sent or called in miscellaneous frequencies they have heard in the utility bands. I write them down on slips of paper and throw them into a folder thinking that someday I will present a sub-article on them here in the column.

Well, folks, the best laid plans of mice and men sometimes go astray and I just haven't done it. So, instead of letting them sit in that folder, this month I'm starting the Ute World Pot Luck frequency section.

If you have a neat little frequency like the ones presented below or a list of frequencies you check often, be sure to send them in and I will run them in the Ute World Pot Luck section. So without further ado:

• Here are some recent reported frequencies to catch Royal Navy and Air Force comms on from the United Kingdom. Most comms will be in USB.

Royal Navy						
Culdrose:	3885	5450	6825			
Pitreavie:	3117	3935	4709	6686	6697	8987
	9032	9036	9043	11213	13238	
Prestwick:	5690	6705	9014			
Rescue frequencies:	3023		5680			
Royal Air Force						
Akiotiri, Cyprus:		4730	6751	11234	18018	23220
Architect:	4742	5729	6738	9032	11204	11234
	18018	23220				
Bampton:	3112	4707	9022	13257		
Boulmer:	6715	6740	6760	8992		
Buchan:	3116	3916	4707	6740	6757	11180
Gilbraltar:	4742	9032	11234			

While I'm across the pond, here are some German Air Force frequencies you might want to check for activity:

5591 5691.5 6693 6718 6762 9000 11187 11272 13248 23342

• There is a new (at least to me) RTTY mode that has been reported to me that may be unfamiliar to you, too. It is called TORG 10. Normally this mode has 100 baud and 1500 Hz shift. The only one I know using the mode at this point is SAAM in Moscow on 18490.0 kHz.

• A new Inform net channel has been reported. It is channel A9 and the frequency is 4612.0 kHz.

• Addis Ababa air traffic control in Ethiopia is using the frequency 7595.0 kHz in USB for controlling aircraft. Look for activity on this channel late afternoon to early evening local time here in the States.

• The Royal Australian Air Force has been reported on two frequencies recently: 8975.0 and 13207.0 kHz in USB. Check the latter in the earlier evening hours and the former from about 0700 to 1300 UTC.

Well, that does it for this month. I want to thank all of you, the readers of this column for the continued support you have given this column. As I start my 11th year with *MT* this month, I want to acknowledge that I could not have done it without you, the readers. Thank you very much for your contributions and until next month, 73 and good DX to all de N5FPW. MT

Utility World

Utility Loggings

Abbreviations used in this column

AFB	Air Force Base	m/v	Motor Vessel
AM	Amplitude Modulation	NASA	National Aeronautics and Space Admin.
ARG	Aerial Refueling Group		
ARQ	Synchronous transmission and automatic repetition teleprinter system	NE	Northeast
		Net	Network
		NOAA	National Oceanographic and Atmospheric Admin.
ARQ-M2	Multiplex ARQ system with two data channels	NORAD	North American Aerospace Defense Command
AWACS	Airborne Warning and Control System		
BW	Bomb Wing	Ops	Operations
Comms	Communications	PIAB	Presse- und Informationsamt der Bunderegierung
Comsta	Communication Station		
CP	Command Post		
CQ	General Morse code call for any station	RAF	Royal Air Force
		RTTY	Radioteletype
CW	Continuous Wave (Morse Code)	SAM	Special Air Mission
		SAR	Search and Rescue
DSN	Digital Switched Network	Satcom	Satellite Communications
ETA	Estimated Time of Arrival		
FEC	Forward Error Correction teleprinter system	STRATCOM	Strategic Command
		TACAMO	Take Charge and Move Out
FEC-A	One-way traffic teleprinter system	UK	United Kingdom
FEC-S	Newer FEC mode, not many stations using	UN	United Nations
		Unid	Unidentified
FEMA	Federal Emergency Management Agency	UNPROFOR	UN Protection Force
		US	United States
FF	French Forces	USB	Upper Side Band
F/V	Fishing Vessel	USCG	US Coast Guard
GHFS	Global HF System	USCGC	US Coast Guard Cutter
GREEN	Scrambled communications	USCS	US Customs Service
MFA	Ministry of Foreign Affairs	USS	US Ship
Meteo	Meteorological	UTC	Universal Time Coordinated

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

2573.5 WLO-Mobile Radio, AL, with fax chart of the Gulf of Mexico using 120/576 at 0240. (Jim Navary-Colonial Heights, VA)

2806.0 IGJ41-Augusta Naval, Italy, with V CW marker at 0238. (Navary-VA)

3378.0 WGY912-FEMA Berryville, VA, with CW traffic practice at 0200/0845 Thursdays UTC. (H.S. Strohecker-San Diego, CA)

4028.0 Spanish female 5-digit number station in AM at 0603. (Strohecker-CA)

4331.0 WCC-Chatham Radio, MA, with V CW marker at 0736. (Dave Ditlow-Los Angeles, CA)

4602.0 Irish military with tactical calls passing routine messages in USB at 1815-2045. (Ary Boender-Netherlands)

4742.0 RAF Architect on with weather broadcast for UK bases in USB at 0231. (Bill Fernandez-MA)

4763.4 VAC75 working VEP76 (no phonetics used) with what seemed like "camp" support comms with morale calls to family back home. Mention of "Camp", "Navajo Crew", "Dr. John" and generator problems from some rain. A plane was scheduled to land at the camp the next day. Sounds like archaelogical dig somewhere in the SW US in a remote location, in USB at 2355. (Fernandez-MA) *Probably not Bill, this is Canadian, see next logging-Larry.* VEP706 working VAC16 at 2245 in LSB. VEP706 is a hunting camp presumed in Labrador with traffic regarding the number of moose and caribou killed by hunting parties. Talk about baiting for bears. VAC16 gave VEP706-709 area code phone numbers (Newfoundland) for butcher and transport of meat. Towns mentioned were Deer Lake and Stephenville, NF. Talk about taxidermy arrangements. (Rausch-NJ)

4900.0 CHM7211 working CHM7231 with training exercise messages at 0130 in USB. (Rausch-NJ) *This has been used by Cape Radio and NASA in the past-Larry.*

5220.0 NTCH-*USS Thomas C. Hart* sending 75 baud encrypted RTTY, able to get NTCH prior to encryption at 0500. (Navary-VA)

5225.0 C4R working Q3R trying to set up RTTY comms so that data messages could be sent in USB at 0235. (Fernandez-MA)

5310.0 UNPROFOR Mediterrean using tri-letter/numbers calls with tracking reports in USB at 2035-2115. (Boender-Netherlands)

5320.0 USCG Group Corpus Christi working Q6E with message traffic in the green using USB at 0333. (Navary-VA)

5412.5 Pronto and Ambrose doing a loopback RTTY circuit test in USB at 0735. (Jeffery Jones-Tracy, CA)

5680.0 Charlie Sierra 1 calling Charlie Sierra 2 in USB at 0303. (Navary-VA) *Jim see next log-Larry.* Venezuela Radio and Northern Lights station VT-6 spent 30 minutes testing radios "happy to have established a comm-link and now will save money." Later changed ID's to CS-1 and CS-2. (Richard Baker-Austintown, OH) *Interesting activity on an International SAR channel-Larry.*

5696.0 Reach 6020 working COMSTA Portsmouth with USB radio check at 1235. (Navary-VA)

5732.0 Charlie 43 calling November 44, no joy on HF. USCS comms heard 0520 in USB. (Baker-OH) Charlie 42 calling November 44 in USB at 0103. ((Navary-VA) *Interesting, guys, I only show Vandenberg here; is USCS something new.*

6200.0 NONG calling NMO-USCG Honolulu with no answer in USB at 1845. (Gordon Levine-Anaheim, CA) *Gordon, I don't have a listing for NONG, wonder which CGC this is?-Larry*

6224.0 WBQ-Bowling Green, KY (Hines, Inc) working *m/v Duncan Hines, Warren Hines,* etc. at 1255 in USB. (Neal Perdue-Madison, AL)

6227.0 WHS-Vicksburg, MS, working many "---- Golden" m/v's at 1610 in USB. (Perdue-AL)

6353.5 Two males with Brooklyn accents talking about torpedo boats, power of radios and arrangement to "that" person call Monday. Heard 0015 in USB. (Baker-OH)

6730.0 Unwanted (*I feel that way sometime-Larry*) working MacDill AFB with data exchange transmissions. Probable South American pirate kept trying to break into the net. MacDill and Unwanted pointedly ignored the joker. In USB at 0348. Unwanted also on 11176.0 (phone patch via Ascension to DSN 781 to probable Barksdale location. Moved from 6720 to 11226.0 (Jeff Haverlah-Humble, TX)

6732.0 Commercial fisherman talking to his wife and son. During comms wife told husband, "turn the boat back the way it was, you're fading!" In USB at 0100.(Jones-CA)

6745.0 Numbers/phonetic letters station in AM at 0250. (James Laughlan-Youngstown, NY)

6750.0 Several stations on a net with radar tracking data in USB at various times. Then Okie Sam called by Bluecrab but Okie Sam answered with Foxtrot Tango to complete the radio check. (Fernandez-MA)

6910.0 Yoglund (?) working Acrobat "transmitting on E3 and receiving on F2" in USB at 1205. Called for a long time. (Harry Riddell-Rochester, NY)

7330.0 Unid station (sounded like Sitdown) calling Redhanded on Sierra 307 in USB at 0335. (Haverlah-TX)

7425.5 Spanish female 3-digit number station on top of WEWN at 0000 in AM. (William T. Hassig-Mt. Prospect, IL)

7535.0 Norfolk SESEF working Statesman requested to go green in USB at between 1714-1847. Later moved to 18200 and 5745 to attempt to establish secure RTTY circuit. (Baker-OH) *Wonder if Statesman is the USS George Washington (CVN-73)?-Larry*

7625.0 HZN47-Jeddah Meteo with 100 baud RTTY weather codes at 1930. (Robert Hall-Capetown, RSA)

7691.6 USCG Group Mayport working Y5C at 0310 in USB. Advised Y5C to shift to frequency 3A3. (Rausch-NJ)

7741.0 MacBeth 39 calling *USCGC Reliance* in USB, no joy. *NRUF-USCGC Mohawk* (WMEC-913) answers, 39 then passes 3 "alpha" (air) contacts and related information. *USCGC Reliance* comes up and request 39 pass his reports to Mohawk. (Baker-OH) *Able Manner operation channel-Larry.*

7862.0 Five digit CW cut number station at 0403. (Strohecker-CA)

7880.0 DDK3-Hamburg Meteo with poor fax chart at 2005. (Hall-RSA)

7887.0 Five digit CW cut number station at 1003. (Strohecker-CA)

7900.0 9VF39-PIAB Singapore with FEC-A news in German at 1635. (Hall-RSA)

8047.0 KCF140 working All American EOC checking the status on some equipment testing that was in operation on another frequency. Both

male operators did not sound military, in USB at 0205. (Fernandez-MA) Alpha 36 calling Alpha 47 for a radio check in USB at 0735. (Jones-CA)

8056.0 Hardrock 33 (ground) working Mission Delta (aircraft) confirming 3 aircraft over target spaced 15 minutes apart in USB at 0744. Also Y4Q with KL43 data for R7G and RG1 in USB at 1750. (Jones-CA)

8060.0 English female, 839/00000 in AM at 0500. That was it, no other numbers. I think I can decipher this one, how about "No message"?!

8080.0 R3G working X0F for data equipment check in USB at 0303. (Jones-CA)

8081.0 Roll call trying to raise Broadleaf and Evans for a radio check in USB at 0400. Heard Evans working 6818.5 last month. (Jones-CA)

8083.0 RIJ75-Tashkent Meteo, CIS, with poor fax chart at 2026. (Hall-RSA)

8163.0 English female 3/2-digit number station in AM at 1400. (Jones-CA)

8294.0 HOS (?) Affirm calling HOS Centurion many times in USB at 1428. I have heard HOS Iron Lee a few months ago on this frequency working KPN-Houma, LA. (Perdue-AL) *Neal, I have no idea who this bunch is, readers?-Larry*

8418.0 Spanish female 4-digit number station in AM at 0300. (Strohecker-CA)

8974.5 Unknown station retransmitting KRAK-AM 1140 Sacramento, CA, monitored from 0550-0700. Retransmission was live based on time checks. QRMing Customs net on 8972. Wierd! (Rausch-NJ) *Yep, you get the wierd log of the month award, Ed-Larry.*

9006.0 Andrews AFB on F426 working SPAR 64 with radio check from F118 in USB at 0300. (Jones-CA)

9014.0 Andrews AFB calling SAM 681 with a radio check in USB at 0100. Not a normal Andy frequency. (Haverlah-TX)

9017.0 SAM 26000 periodically working Andrews AFB with personal patches, half hour radio checks, patches from State Ops and info on Senate tax vote outcome. Periodic weak US STRATCOM activity on frequency in USB at 0300. Safe Call calling Vocation, then Mainsail. Vocation responded just after he departed in USB at 2209. Earlier heard on 5700 and 6730. (Haverlah-TX) Okie Sam and Dragnet Uniform at 1600 in USB. Greensky working Daisy in USB at 1620 (moved to 11070.0 W-108). (Dan Michel-Atlanta, GA) SPAR 76 on F331 working Andrews AFB in USB at 0317. (Jones-CA)

9023.0 Guardian (NORAD) working unid station via scramblers with some comms in the clear in USB at 0310. (Fernandez-MA) Crisco and 5 players in playground advising all to go to satcom in USB at 1510. Dragnet Yankee working Oak Grove and Wellington in USB at 1630. Mentioned 364.2 MHz for Dragnet Yankee and Oak Grove. (Michel-GA) Old Salt in comms with Deer Hunter, Ghost 61 and Bird 705. Bird 705 said he was inbound to Old Salt in USB at 2330. I'm not familiar with the Bird call, maybe an A6? (Jones-CA) *Doubt it, Jeff, no HF on an A6 probably an E-2 Hawkeye-Larry.*

9027.0 Aircraft 089 calling Skyking in USB at 2336. (Jones-CA)

9323.0 Andrews AFB working Approximate on F357 from F064 in USB at 0440.(Jones-CA)

9921.0 Andrews AFB working SPAR 66 for a radio check from F118 in USB at 0240. (9921.0 is F053). (Jones-CA)

9962.0 Spanish female 5-digit number station in AM at 0400. (Jones-CA)

11150.0 Navy NH600 working Incirlik with radio check. Incirlik says he is testing new equipment on this frequency in USB at 2150. (Boender-Netherlands)

11055.0 Blacklist working Hambone for artillery coordinates in USB at 0140. (Jones-CA)

11155.0 English female 5-digit number station in AM at 0220. (Jones-CA)

11176.0 Moose 42 working Ascension with phone patch to Raymond 34 (*Wonder who this is-Larry*) in USB at 0243. (Haverlah-TX) Poker 83 (KC-135R tanker) working MacDill with patch to Ellsworth in USB at 1705. Shadow 71 (KC-10A tanker out of Seymour Johnson, NC) with patch to Coyote (ARG, Forbes Field, KS) about refueling ops in USB at 1707. Super 71 (KC-135 tanker out of Barksdale) working MacDill with refueling ops schedules in USB at 1710. Reach 50240 (C-141) working Kelly Ops via Asecension phone patch in USB at 0410. (Fernandez-MA) At 1542, Thunderbird 14 working Offutt GHFS with phone patch in USB. Pawn 85 (KC-135A 93 BW Castle AFB) working Offutt with phone patch to Raymond 30. At 1741, Havoc 75 (B-52H from K.I. Sawyer AFB, MI) working Offutt with phone patch to Bunker Hill (410th BW Control CP) asking why tanker was canceled. At 1836, Vocation (see 9017.0) working Offutt with phone patch to Sing Song for comms check in USB. (Baker-OH)

11191.0 Lima, Fox Tango and Hotel using Seminole prelude and mentioned alligator playground in USB at 2135. (Bob Pettengill-Blanchard, OK) Fox Tango net throughout the afternoon working around occasional Hershey traffic in USB at 2044-2200. (Haverlah-TX)

11214.0 Bandsaw Golf (E-3C AWACS aircraft) working Northern Lights and Backburner with comms about setting up a weapons exercise involving Huntress (NORAD Air Defense NE at Griffiss AFB, NY). Discrete frequencies given as 312.8 (primary) and 322.6 (Playground). I think I heard this exercise later on 4711.0, 5225.0, and 9023.0.Sounded like a big exercise off mid-Atlantic coast in USB at 1540. (Fernandez-MA) Juliet Tango working Tango Echo in clear then went green in USB at 1533. (Michel-GA) *These comms are probably RAF as this is a commonly used RAF channel, the two letter calls are the big give away-Larry.*

11226.0 WAR 46 calling Primitive in USB on Xray 905 at 2038. WAR 46 calling Paidoff in USB at 1848 then Paidoff talking to Alley Cat in USB at 1852. (Ditlow-CA)

11229.0 Andrews AFB working Air Force One with signal checks on F025. Checked F404 (11466.0) in USB at 2347. (Jones-CA)

11272.0 Plymouth Rescue (fair to weak) working Rescue 51 (based apparently out of Shannon) in USB at 2115. Moved here from 13205. Neither frequency listed for UK military or SAR activity. (Haverlah-TX)

11466.0 Air Force Two working Andrews with phone patch at 0410 in USB. (Jones-CA)

12353.0 WRD785-Seattle, WA, working vessel *Concepcion* in USB at 0228. (Warncke-CA)

12356.0 WHV575-Lynnwood, WA, working *F/V Aleutian* in USB at 0201. (Warncke-CA)

13204.0 Aircraft 5 working Aircraft 1 periodically during mid-day. Apparently engineering/maintenance work in USB at 1658. (Haverlah-TX)

13207.0 21 Sierra 4 (*probably a Navy TACAMO aircraft-Larry*) working Thule AFB with phone patch traffic to various Rhein Main operations in USB at 2317. 13201 apparent primary. (Haverlah-TX)

13208.5 Flight pair Pearl 81/82 briefly working Pearl Control with ETA message in USB at 2025. It would now seem that this frequency is the primary channel for the Pearl call signs. (Haverlah-TX)

13211.0 Air Force 2 calling Offutt Global, Andrews answers makes phone patch to Crown 13 regarding fax sent. Heard in USB at 0238. (Baker-OH)

13267.0 NOAA 42 aircraft working MacDill AFB with phone patch traffic in USB at 0100. (Pete Reichert-Pennsauken, NJ) Heard NOAA 42/43 in USB with MacDill at 2130. (Rausch-NJ)

13565.0 Andrews AFB working Marine 691 pn F529 for best station location in USB 1813. (Jones-CA)

13823.0 SAM 972 working Andrews AFB for phone patch on F377 in USB at 2248. (Jones-CA)

14867.0 PACCOM 01 working Andrews AFB for Agana, Guam, weather in USB at 0200. (Jones-CA)

15015.0 Shark 28 working Ascension with a phone patch to Lobo Ops (Cherry Point) in USB at 1527. (Michel-GA)

15044.0 Lodges calling Paid-Off for a radio check. Also heard on 11226.0 and 5700.0 in USB at 0250. (Jones-CA)

16025.0 BAF9-Beijing Meteo with fax charts at 1111. (Hall-RSA)

16147.9 RFFVAD-FF N'Djamena, Chad, idling with ARQ-M2 mode at 1124. (Hall-RSA)

16495.0 English female 3/2-digit number station in AM at 0319. (Warncke-CA)

16957.0 FUF-French Navy Fort de France, Martinique, with V CW marker at 0128. (Pettengill-OK)

16959.0 FUM-French Navy Papeete, Tahiti, with V marker in CW at 0125.(Pettengill-OK)

17161.3 VIS6-Sydney Radio, Australia, with a V CW marker at 0401. (Warncke-CA)

17442.0 5YE-Nairobi Meteo, Kenya, with RY 100 baud RTTY test tape at 1022. Fax broadcast heard on 17445.6 at 1030. (Hall-RSA)

18230.2 OMZ-MFA Prague with 100 baud RTTY Czech news at 1240. (Hall-RSA)

19751.5 6VU79-Dakar Meteo with fax weather chart at 1314. (Hall-RSA)

19756.8 Diplomatic Jakarta, Indonesia, with traffic for Algeria using FEC-S via REDBUS mode at 1155. (Hall-RSA) *Robert, what is a REDBUS mode-Larry?*

22463.0 JCU-Choshi Radio, Japan, with CQ CW marker at 0204. (Warncke-CA)

22458.0 XSX-Keelung Radio, Taiwan, with CQ CW marker at 0208. (Warncke-CA)

22482.0 HLG-Seoul Radio, South Korea, with CQ CW marker at 0246. (Warncke-CA)

22603.0 PPR-Rio Radio, Brazil, with V CW marker at 0045. (Strohecker-CA)

22636.5 JCT-Choshi Radio, Japan, with CQ CW marker at 0311. (Warncke-CA)

22670.0 JCS-Choshi Radio, Japan, with V CW marker at 2330. (Strohecker-CA)

The Scanning Report

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

Futuristic Scanning

Welcome to the twenty-first century. Concealed in your shirt pocket is a high tech monitoring device that automatically locks onto the nearest transmission. A small wire, concealed inside your shirt, links the device to your ear. You hear anything and everything. Frequencies are no longer important—you don't need them. When a microphone button is pressed, you instantly hear the conversation. There's no need to fumble with a clumsy scanner radio. There's no need to punch in specific frequencies. You do nothing. There is nothing to do but listen. Radio communications cannot escape you—you hear everything between 30 and 1000 megahertz.

Are you intrigued? Wouldn't it be thrilling if you could step into the future, grab such a device, and bring it back? If it sounds like a futuristic dream, you couldn't be more wrong. Optoelectronics, a leader in creative communications instrumentation, has reached into the future to give you the "Interceptor."

The Interceptor responds to any strong, FM radio signal. You don't tune it, you don't set it, you simply use it. It won't provide you with specific frequencies, but it will allow you to listen to nearby radio communications. Take it to the shopping mall, and you can hear the radio transmissions from mall security guards. Take the Interceptor to a military base, the airport, or to the races, and you can forget about looking for specific frequencies. The Interceptor doesn't need to be tuned or set to a specific frequency range. It simply responds to the nearest transmitter—providing you with nonstop listening action.

Field Test

With the Interceptor concealed in my shirt pocket, I walked into the International Airport in Philadelphia. The first transmission heard was from a flight line baggage handler. The contents of the conversation, indicated that "B" concourse was bustling with activity. With my ear piece firmly in place, I followed the signs to section "B". As I ascended the escalator to the second floor, I could now hear both sides of the flight line baggage communications.

The "Interceptor" is a high tech instrument that can monitor between 30 and 1000 MHz.

I also monitored several conversations that sounded like a security company. Since the Philadelphia Police are responsible for airport security, I was intrigued by the unusual transmissions that identified individuals by single digit numbers.

As I turned the corner and entered Concourse "B", I came to an abrupt stop. Directly in front of me was a metal detector. Should I continue forward? If so, how would the guards react to the odd looking metal box in my shirt? Before I could make a decision, a man dressed in a suit, gestured for me to walk towards him. As I did so, he smiled, stepped backward and allowed me to walk around the check point. It was a puzzling moment that I cannot explain.

Inside the Concourse, I stopped at a boarding area and leaned against a large window. Suddenly a strong, clear voice was talking in my ear. It was definitely a phone call, but only one side of the conversation was heard. When I turned to see if anyone was using a cellular phone, I lost the signal.

Various types of data signals were also common in the airport. High pitched, musical notes, paging tones and Morse code signals were just a few of the sounds that were intercepted.

The Interceptor is definitely a futuristic instrument that will provide hours of listening enjoyment. You can carry it into a hotel, plug an amplified speaker into the phone jack and listen to hotel security and maintenance communications. The Interceptor can also be connected to a mobile scanning antenna and utilized to hear communications from your vehicle.

As I've already mentioned, the Interceptor won't provide you with specific frequencies. However, it can be used to detect and eventually identify hidden radio transmissions. Imagine for a moment that you have intercepted an unfamiliar transmission. We already know that the source of the transmission won't be far away. If you can visually identify the transmitter and/or antenna, it may be possible to assign the transmission to a specific band of frequencies. A scanner radio could then be used to search between two frequency ranges.

The contents of a radio transmission may also help you to determine the operating frequency. Are you listening to a police department, security company or federal agency? If you can identify the user, you can narrow your search to a specific band.

It's important to remember that the Interceptor will lock onto any strong, local FM signal. If you simply place the Interceptor into your pocket and walk along the street, you'll probably only hear FM broadcast stations. You can limit interference from unwanted transmissions by adjusting the unit's squelch, or by using antennas that have been designed for a specific band of frequencies.

The Interceptor retails for $359.00 dollars and is available from Optoelectronics, 1-800-327-5912. Best of all, the Interceptor has a money back guarantee. If you're not satisfied, simply return the instrument for a full refund.

Treasure Hunt

Congratulations! You are the lucky winner of two frequency allocation cards. For our November/December Treasure Hunt, I'll be giving away two cards to everyone who enters. To win your cards, try your luck on the following questions:

1. The rear panel of the Bearcat 800 XLT has two antenna connectors. True or False?
2. Name the agency that utilizes the frequencies between 144.00 and 148.00 megahertz.
3. What percentage of the signal is lost at -3dB?
4. A novice class Ham license requires a Morse code test. True or False?
5. Provide one frequency that is "off limits," to the scanner listener.

Each participant will receive one VHF/UHF card and one Federal allocation card. The cards can be placed in your wallet and used to quickly locate the frequency ranges of specific agencies. To receive your cards, an SASE ***must*** accompany your entry. Send your answers to the Treasure Hunt, P.O. Box 98, Brasstown, NC 28902.

Frequency Exchange

During the winter months, ***Niagara Falls, New York,*** can be a very scenic location. The "*Maid of the Mist*" is closed for the season, but the scanning frequencies are active all year. James Laughlan lives near the Falls and he routinely monitors the following:

46.06	Niagara County fire
46.22	Niagara County fire
146.755	Niagara Falls Ham repeater
154.755	Niagara County Sheriff
155.505	State Police
155.535	New York State Police
155.685	Park Police (active during barrel rides over falls)
444.625	Niagara Falls Ham repeater
460.375	Niagara Falls Police
460.525	Niagara Falls fire

If you love the frigid air and snow, don't miss our next stop. Welcome to ***Ontario, Canada.*** Fred Noakes wants everyone to know that the metro ambulance has changed to a trunked system. Here are the frequencies:

858.1375	858.3875	868.6375	858.8875
859.1375	859.3875	859.6375	859.8875

The trunked frequencies for the Toronto Police are:

851.3375	857.4625	860.9375	862.1625	862.9375
852.0625	857.7125	860.9625	862.1875	862.9625
852.1625	857.7625	860.9875	862.2125	863.1625
852.7375	857.8125	861.0875	862.2375	863.1875
852.8125	857.9375	861.1875	862.3625	863.2125
853.0125	859.3125	861.2125	862.4125	863.2375
853.8625	859.4125	861.4375	862.4375	863.4125
855.5625	859.4625	861.4625	862.4625	863.4375
856.4625	859.7625	861.4875	862.4875	863.6875
857.1125	859.8125	861.6625	862.5125	863.9375
857.1625	860.3125	861.6875	862.6625	864.2125
857.1875	860.4375	861.7125	862.6875	865.2125
857.2375	860.4625	861.7375	862.7125	866.600
857.4125	860.7625	861.9625	862.7375	
857.4375	860.8125	862.1125	862.9125	

Each time the dispatcher or constable releases the microphone on the radio, the conversation can continue on any one of the remaining channels. Monitoring a trunked system is tough, but it can be done. To receive a list of "Trunk Busting Secrets," send a #10 SASE with $2.00 dollars to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Our next stop is the home of Louis "M," in ***Pearl River, New York.*** Louis has provided the frequencies for Rockland County.

154.665	State Police, car to car	155.655	Orangetown Police
154.77	Suffern Police	155.77	Haverstraw Village Police
154.935	State Police, car to base		
155.52	Sheriff	155.97	Spring Valley Police
155.535	State Police, base to car	453.425	State Police Troop T
155.595	Haverstraw Police	453.525	State Police Troop T

If you want the complete list that includes nearly one hundred frequencies, send a #10 SASE to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Ed Silvia lives in ***Taunton, Massachusetts,*** and he has invited us to enjoy his favorite frequencies.

33.98	Taunton fire	155.01	Seekank Police
39.10	Taunton fire	155.22	Bristol County ambulance
39.54	Norton Police	155.67	Rehoboth Police
42.44	State Police		
42.50	State Police		
44.74	State Police		

Ready for a warmer climate? Ray Hayes lives in ***Corpus Christi, Texas***, and he claims that during the winter season, the temperature is a balmy 70 degrees.

39.98	Texas Railroad Commission	158.175	Water & Gas Dept.
151.415	Texas Parks and wildlife	158.250	Water & Gas Dept
154.175	Fire Department	158.745	Sanitation Dept.
154.19	Fire Department	158.82	Animal control
154.95	Inner-City Police	460.60	Refinery fire dept.
155.16	Medical Center		
155.595	Alcoholic/Beverage Comm.		

Our next warm weather invitation is located 35 miles north of ***San Francisco, California.*** The city of Petaluma is located along Highway 101, and is home to Matt Rapaport. Here are Matt's favorite monitoring targets.

151.25	Sonoma Ranger tactical	154.31	Sonoma Dispatch
151.46	Dept. of Forestry	154.385	Fire Gray
153.755	Search & Rescue	154.445	Fire Orange #4
153.77	Fire Orange #2	155.10	Medic Blue #1
154.025	Petaluma Medic	155.265	Medic Blue #2
154.10	Rohnert Police	158.19	Gas & Electric
154.145	Santa Rosa Fire	450.2125	KKGO traffic copter
154.175	Fire Orange #1	450.50	KSFX traffic copter
154.205	Fire Orange #3	453.40	Sonoma Sheriff
154.265	Fire White #2	453.55	Sonoma Sheriff
154.280	Fire White #1	453.575	Sonoma Sheriff
154.295	Fire White #3	453.725	Sonoma Sheriff

It's easy to invite *MT* readers to your neck of the woods. Simply send a list of your favorite frequencies to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Wash & Wear Radio

In September's column, I mentioned that radio technicians will "soak" a radio that has fallen into salt water. Joel E. Thames, owner of the Sound Service Company, wasn't surprised. Here's an excerpt from Joel's letter:

"A portion of our business requires the maintenance of night club audio, video and lighting equipment. We learned years ago that the only way to clean this type of equipment is to remove the cover and thoroughly wash the equipment in hot soap and water. After a final rinsing in warm water, excess water is wiped away and the unit is allowed to dry. Afterwards, the pots are spray cleaned and lubed."

Have you washed your radio lately? If so, I'd like to hear from you. Send your comments to the Scanning Report, Post Office Box 98, Brasstown, NC. 28902.

Scanner Tips

Investigators in New Bradford, Connecticut, arrested two criminals who had stolen three guns. The authorities were able to identify the pair after receiving a tip from a scanner buff. The two criminals apparently used a cordless phone to discuss their illegal activities. (News clipping from *Standard-Times*.)

Silent Ringer

Cellular phones that can answer an incoming call without providing an audible ring are becoming increasingly popular. As you probably already know, the phones can be placed in strategic locations and used as bugging devices. To activate the feature on Motorola cellular phones, the silent ringer and automatic answer feature must be selected simultaneously. Motorola's instruction manual contains the following warning: "We suggest you not select the automatic answer and silent ringer features simultaneously, since incoming calls will then be announced only by the 'call message' in the display and the rapidly flashing power indicator."

$4 Million Radio

The city of Huntsville, Alabama, wants to spend four million dollars on a new, trunked, communications network. Huntsville Police and Fire fighters say that the old radio system is on the verge of overload and is virtually useless during emergencies. The need for a new system is so important that police officers say they need the system more than additional manpower. "What good would it do to hire more officers when we can't talk to each other?" said one officer. (News clipping from Walter Smith, Tanner, Alabama.)

Cellular Farmers

If your idea of a cellular user is a yuppie stockbroker making calls from a foreign car, think again. Farmers are using cellular phones from their tractors and pick-up trucks. A farmer who experiences an equipment breakdown in the field can telephone for help and/or parts replacement.

According to "Comnet 2000," which is the largest provider of rural cellular service in the midwest, more than 25 percent of cellular customers are farmers. The benefits of having a cellular phone on a farm where the nearest wire-line phone may be miles away, are attracting more and more farmers as customers. Gene Schiffler who owns a ranch in Twin Falls, Idaho, claims that a cellular phone is a tool that he can't be without. (News clipping submitted by David Alpert.)

Tower Benefits

The Mayfield, Ohio, Police Department, has received a $50,000 dollar lump sum payment and free cellular phones. The funds and phones were provided as an incentive to approve "Cellular One's" request to erect an antenna tower.

Two years ago, "GTE" was refused a similar request to erect an antenna tower in another area. The mayor of Mayfield said, "Cellular One's request was more suitable." (News clipping from Henry Loewer.)

Telegraph Operations

In the beginning of this chapter, we talked about traveling into the future. Let's slow down for a moment and reflect on the past. The year is 1925 and you're standing in a railroad telegraph office. Posted on the wall, are the following instructions:

When closing office for the day always disconnect instruments from circuits by cutting out at the switchboard, and in doing so be careful not to leave main circuits interrupted.

Keep instruments clean and in good working order, and when repairs are required notify the Superintendent of Telegraph. Become sufficiently familiar with the switch board to enable you to make such wire connections as may be directed.

Local batteries must be kept clean, and no dampness allowed on the space between the cells, nor on the floor beneath them. Batteries must be cleaned and renewed at such times as will least interfere with business.

In case of an interruption to the line, examine wire and connections carefully, and if necessary apply ground wire and report to the Train Dispatcher. Ground wire must not be used except when the line wires are interrupted, and then only to report as required, or to transmit business which will suffer by delay.

Signals
1-----Wait a minute.
4-----Where shall I go ahead.
5-----Message for all.
8-----Busy.
9-----Wire test.
15----Weather report.
19----Train orders.
31----Train orders.
54----Train orders
O.S.--Train reports

J. B. NORCROSS
Superintendent of Telegraph

The complete two page list of orders was too lengthy to print here. If you're a railroad fan, I'll send you a copy of the orders for free. But there is a catch. You must include an SASE and your letter must be post marked by December 31, 1993. Send your requests to the Scanning Report, P.O. Box 98, Brasstown, NC 28902.

I hope that everyone finds a scanner radio under the tree. See you guys in 1994!

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This pocket-sized version for Massachusetts also covers Rhode Island and southern New Hampshire in great detail. $13.95.

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It's the most detailed and accurate book ever written on the communications of our nation. The 822-page guide covers 250 metropolitan and resort areas (now most of the U.S.), along with all state, intercity, and federal radio nets. Because this book was written with the help of state radio managers and hundreds of the most knowledgeable hobbyists, it's filled with police, fire and EMS frequencies, exact channel usages, codes, unit ID's, maps, trunking plans and even radio system descriptions. This edition covers railroads, military air, race teams, phones, shortwave, federal agencies, plus State Patrols, DOT, emergency management, forestry, sheriffs, local police, fire, EMS, national parks, ski areas, hotels, malls, sports, media, airports, amusements, colleges, and more. $24.95.

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Written by the RCMA's Rickey Stein, the book covers scanner (police, fire, government, military and business) frequencies in nearly 70 countries around the world. Includes special sections on how to monitor overseas, how to decipher non-English transmissions, and on "skip" monitoring which makes this book great for at-home use as well as for international travel. $24.95.

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Scanner Master, P.O. Box 428, Newton Highlands, MA 02161

GEnie T.AREY1

Are We Having Fun Yet?

Once again it is winter time. The DX is rolling in on Jack Frost's icy breath. (See what those mail order writing schools teach you?) Once again I will sit, bleary eyed, late into the winter night in hopes of catching KFI, Los Angeles, California, 640 kHz.

Who knows? This could be the year to bag that elusive station. If I can just get one night when WHLO Akron, Ohio, is off for transmitter repairs and that pesky Radio Progreso, Guanabacoa, Cuba, would fall into a crack in the earth, not to mention the half dozen "low power" stations that also populate the frequency. At least WWJZ, Mount Holly, NJ, remains silent at this time due to financial hassles. Clear channels just aren't all that "clear" anymore.

What's the point, Uncle Skip?

The point is that KFI is a hard but far from impossible East Coast DX catch. The point is also that staying up well past midnight on a Sunday evening with the prospect of facing work on Monday morning just doesn't hold the allure it once had so many years ago. Catching KFI would be a great achievement; it just wouldn't be all that much fun.

Over the last few years I have not spent as many late nights hunched over the dials as I once did. Admitting this in a national magazine will no doubt cause my effigy to be burned at several DXer gatherings. The assembled DXperts will say "How dare Uncle Skip say such things to beginners? Only through sacrifice will they become great DXers like us!" and they'll call for my head on a spit. My advice to these folks is simple . . .

Relax. This is a hobby. It's supposed to be fun! Remember?

A lot of beginners write me after they have been involved in the hobby for about a year and tell me that they are getting "burnt out." The endless stream of technology and information that our hobby presents tends to frighten more than a few beginners away. These folk's fears are not helped in the least by a small but prominent group of DXperts that populate many radio hobby publications and gatherings, putting forth the notion that you can only "enjoy" the radio hobby if you have several thousand dollars worth of equipment and devote countless hours to study. I know one guy who has worked his way through three wives in pursuit of DXellence. I'm not sure a hobby is worth such a cost. But then again, I've never played golf.

A hobby is supposed to be something that takes a person away from the stresses of the "real" world of work and responsibility. A hobby is something you do for a few hours each week to rest, relax and recreate. However, many hobbies, radio included, can involve the hobbyist to the point that they become as intense as all those things he or she took up the hobby to get away from. Beginners are especially susceptible to this trap. So Old Uncle Skip's holiday gift to each and every one of you is a list of tips to avoid turning the radio hobby into another one of life's pressure cookers.

You can listen to anything you want to. You just can't listen to everything you want to. At least not in this lifetime.

When you realize that the monitoring hobby includes the possibility of tuning in to thousands of frequencies in order to listen to communications from hundreds of countries in any one of a dozen or so modes, it's a wonder that we can listen to anything at all. To enjoy it, you will have to narrow your focus a bit.

I call this the stamp collector's system. Few stamp collectors spend their time blindly filling books with the thousands of stamps that the world has to offer. Doing so would be more akin to drudgery than pleasure. Most stamp collectors settle in on a few areas such as particular countries, era or design (for example, radios).

Beginning radio monitors will first want to dial around to get a notion of all the wonderful signals there. But continued happiness will be found, for most folks, by settling in on areas of listening interest. This is why *MT* has so many columns on the different aspects of radio monitoring. You may enjoy shortwave broadcasts but not be particularly interested in utility monitoring. You may like to listen in on aircraft but not have much desire to follow the other things you can hear on your scanner.

And, of course, there are no rules to say that you can't change your mind down the road. It ain't nobody's business but your own, Compadre! Radio monitoring is a vast smorgasbord and it's perfectly okay to eat dessert first. The point is to have fun.

So Many Frequencies... So Little Time

One of the first hurdles beginners have to acknowledge is that radio monitoring is not as simple as flipping on the car radio on the way to work. For that matter, *when* you go to work may even have a profound effect on how you go about enjoying the radio hobby. Many of the signals folks like to monitor can be heard better or worse depending on the time of day. This is due to signal propagation, the science behind how a signal travels through the atmosphere between two points. You simply can't fight propagation. It is also unlikely that you will ask for a shift change at work just to pursue that elusive signal from Radio Freedonia.

Only you will know what portion of the day you may have to spend relaxing with the radio hobby. This information, coupled with the Propagation Charts in *MT* will help you settle on those bands of frequencies that will yield the most signals. If the time you have to devote to radio monitoring falls outside of optimum long distance propagation, you may have to find your fun in the world of shorter haul communications. Some shortwave signals will be available at any time of the day; you simply need to match your listening time with the right frequencies.

Scanner monitors find their fun right around the corner. Any VHF/UHF scanner will yield plenty of listening excitement that is not nearly as dependent on propagation as shortwave monitoring. The point is that monitoring frequencies that are optimum to the time you are able to listen will greatly reduce the frustration factor.

Al Weiner and a Shriner join in the fun at the 1990 Monitoring Times Convention.

To DX or Not to DX That is the Question

DXing—the ability to monitor signals over great distances—is always a combination of skill, art, persistence and, most of all, luck. Some hobbyists derive a great deal of pleasure from catching a signal from a station half way around the world. Chasing DX may be fun in its own right, but it is often made more enjoyable when it is a means to an end. Programming from those far off stations is usually quite interesting.

While we are on the subject, no where does it say that a radio hobbyist must chase DX to be a person of worth. There are hundreds of countries that broadcast programming directed at you, and who go to great lengths to make their signal easy to tune. Listening to radio stations from far off lands is a great way to get to know the world around you. So don't feel you have to keep filling your log with new contacts. Take some time to relax and enjoy what you're hearing as well.

Old Uncle Skip is of the school that believes that DX is any signal you never heard before, whether it is 5 or 5000 miles away. The excitement of exploring new territory is wherever you choose to find it. Remember, there is no rush, folks! Enjoy taking in the world around you at whatever speed is comfortable to you. If you remain curious in your listening, over time, the "big" DX will eventually find its way to your antenna.

Avoid Infoglut

Thanks to recent developments in technology, it is possible to acquire large amounts of data very quickly. Home computers also allow the radio hobbyist to manage and massage this data in countless ways. Computers can even interface directly with many modern receivers. The price we pay for this technological convenience is that we can quickly become buried under a pile of data. Never forget that the hobby is supposed to be radio monitoring and not data management. Having a load of data at your fingertips can be either an aid or a burden, it's up to you.

Remember when I said earlier to take your time and listen to your radio at your own speed? If you want to avoid infoglut, you will have to do the same thing with data. For most beginners, the frequency information that you will find in the pages of *MT* will keep you on the edge of your seat with plenty of great listening targets. Over time, the addition of books like *Passport to Worldband Radio*, the *Grove Shortwave Directory* and the *World Radio TV Handbook* will round out your information tools. Scanner users can get most of what they need from frequency books such as Gene Hughes' *Police Call Radio Guide*.

When you have grown comfortable with the flow of information from texts such as these, you may be ready to experiment with the many commercially available radio databases that have arrived on the market. If the quantity of data has you overwhelmed, it is of little use to you anyway. So throttle back and acquire the information at a speed that won't turn your hobby into a chore. Remember, the best way to eat an apple is one bite at a time. (Or byte, as the case may be)

Put Competition into Perspective

Many radio hobby clubs run various contests or, at least, publish lists of their member's QSL totals. These activities can be great fun. They can also provide an inferiority complex. When you look at the contest totals, remember that the "winners" may be folks that have a great deal of time to devote to participating in such contests. Not everyone can put the real world on hold long enough to be among the top ten.

Old Uncle Skip only scored moderately well in one contest. It happened to run during a weekend when my spouse and sons were away in Alaska and left me to manage the house. My scores would have been really great if I didn't have to stop occasionally to feed the dog. Still, it can be fun to compete on your own level. Be proud of your contest accomplishments. The only person you have to impress is yourself.

Likewise, do not be overly concerned about the large QSL totals that you might see published in club journals. Some of those folks have been involved in the hobby for decades. Be willing to give yourself the same advantage of time.

Most beginners start off with a flourish and log between twenty and fifty countries in quick succession. After that, things tend to slack off at a fairly rapid rate. This is nothing to get discouraged about. You will find a great deal of enjoyment monitoring those more familiar frequencies while you are waiting to catch that next country. Don't just sit there with static coming out of the speaker hoping a signal will materialize. Sit back and enjoy a program on the BBC or Deutsche Welle. Relax! Have fun, folks. That's what it's all about.

Old Uncle Skip, his Significant Other, Number One Son, Number Two Son and Pogo the dog all wish you a peaceful holiday season and a prosperous New Year. MT

Steve Douglass

Secrets of Stealth Hunting

I couldn't believe my eyes when I first saw it. In fact it took me awhile to comprehend what my eyes were seeing. Even though one of reasons for being in the area was to hopefully see a new stealth aircraft in operation, in the back of my mind I guess I had given up hope. Yet, there it was, flying slowly and almost silently a couple of miles away. Even though the sun had set, we could still make out that this aircraft wasn't a conventional one, its strange triangular shape giving away that it was a stealth aircraft, possibly the TR-3A "Black Manta." I was so surprised to see it that I almost forgot that I was holding a video camera in my hand. I turned it on and started taping.

To my great despair the video camera's "battery low" button began blinking. I turned the camera off and hoped it would have enough power to capture some more video when it got closer. It did (barely). When the aircraft was close enough to get a decent image captured about 10 seconds of video before it died. I cursed my luck and hoped that I had some sort of an image. We watched as the aircraft moved a little closer, did a graceful turn and headed back in the direction it came.

Later when I viewed the video I did indeed capture an image (albeit a fuzzy one). With some computer manipulation and enhancement I was able to come up with the image you see here. Then, by using a sophisticated computer design program, I created an artist's rendering based on the details we witnessed plus a few speculative ones thrown in for good measure.

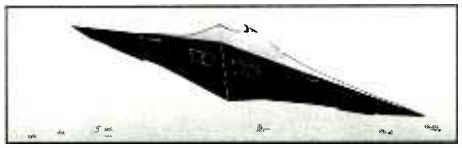
Rules of Evidence

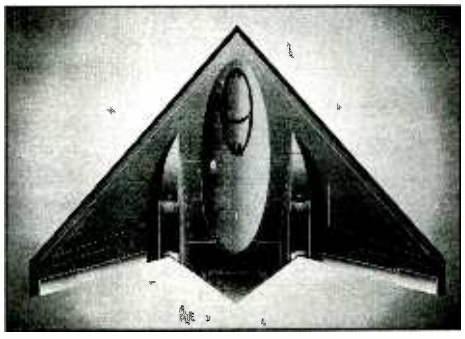
My monitoring buddy (Elwood Johnston) and I seemed to finally be in the right place at the right time, but it wasn't by accident. I had a good idea that the Air Force might be flying the aircraft in the area and planned to be there if they did. Let me be clear in stating that the evidence I acquired was through purely legal means. It involved intelligently monitoring the military airwaves, research and some visits to a few air bases. At no time did the author trespass on federal property, violate any laws or solicit secret information from anyone. I suggest if you are interested in stealth hunting you follow these rules to keep yourself above suspicion and out of jail. However, through hard work, patience, tenacity and using common sense anyone could come up with this evidence. It is then a matter of adding two plus two to come up with the answers.

Operation Roving Sands

Roving Sands exercises are held annually in New Mexico during the latter days of May. For two weeks Army, Navy and Air Force units work together to defeat a common foe (other Army, Navy and Air Force units who play the opposing forces). The exercise is a chance for the three military branches to practice integrating forces as they would in any large conflict.

The real beauty of the exercise is that the units involved aren't assigned to some remote base in the middle of the desert, inaccessible to the public. The Blue and Red forces would establish their commands at a public airport and turn them into fully functioning air force bases almost overnight. The airports chosen every year to host the thousands of military persons making up both forces are the Roswell New Mexico Industrial Air Center and the El Paso International Airport. Other aircraft participating in the exercise are based at Holloman AFB, Alamagordo, NM. Military monitors don't have to be told the advantage of having a large military force camped out at the local public airport.





Laying the Groundwork

On a previous trip to New Mexico (to Holloman AFB) I had monitored unknown (possibly stealth) aircraft using the White Sands Missile Range. During the middle of one night, a lone aircraft took off from a remote strip located on the White Sands Missile Range. The aircraft radioed *Cherokee Control* (the mission controller at WSMR) that he would be doing some work on the range and then landing at Holloman. He also wanted to arrange for security to be on hand when he landed to get the aircraft into a hangar as soon as possible.

Just before the aircraft landed, the security frequencies at Holloman became quite active. All units were advised that a "STF" would be landing soon and that all stations should report in. They also arranged for flight line personnel to guide the aircraft into a secured hangar when it landed and that all security lighting would be extinquished two minutes prior to the STF's approach.

After the STF was secured in a hangar, the maintenance channels became active. It seemed that the STF needed to have its "heat shield" repaired and the entire aircraft needed to be cleaned before "tomorrow's viewing."

The next morning it became apparent from security and maintenance communications that the aircraft was being readied for some sort of presentation. "VIPs" were mentioned as were the base photographer and other officers who were to be on hand for he viewing.

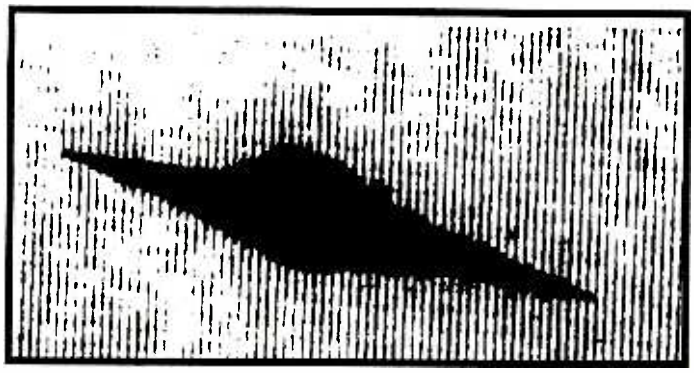
Shortly before the VIPs arrived, the base was closed to all traffic both coming and going. Soon it was easy to tell from the communications surrounding the VIPs who they were. Heading the group was none other than the chairman of the Joint Chiefs of Staff, Colin Powell himself! He had flown up from El Paso, Texas, where he had spent some time reviewing the troops at Fort Bliss. Before he went back to Washington, he made a quick side trip to Holloman AFB (only eighty miles away and minutes by air) to view the STF in some sort of private ceremony. While he was there he was also treated to a flyby by three F-117s.

The visit was over in a few minutes and the general was on his way. Soon the base was reopened to normal traffic. Again, later that night, security communications surrounding the departure of the STF were monitored. The base was blacked out until the aircraft departed and returned to its base.

This gave me the evidence I needed that possibly a new stealth aircraft was being based or tested in the area. When I heard about Operation Roving Sands being scheduled for the area, it suggested the likelihood that the Air Force would use the aircraft in conjunction with the war games.

The Sighting

It was on a Saturday night at dusk when Elwood and I took up our vantage point just outside the fence that surrounded the Roswell Industrial Air Center. We hadn't come in search of stealth aircraft. The first night launch of B-1s from Roswell was taking place and we wanted to be on hand to witness it. I had already been in Roswell a week monitoring the communications surrounding Roving Sands but had not heard



Digitized still taken from video with computer enhanced contrast to define shape.

Operation Roving Sands Frequencies (MHz):

259-200	Roswell Area ATC Highand Low Altitude ACM(F-15s and T-38s)
311.000	B-1Bs to Roswell CP "Rover Control"
321.000	Roswell CP secondary
353.600	Albuquerque Center ATC (high altitude)
397.900	Albuquerque Center ATC (high altitude discrete)
379.200	ACM exercises (F-15s-T-38s)
362.300	A-10 Warthog air to air coordination
344-300	A-6 intruders air to air coordination
272.700	Navy CP Roswell
340.100	Albuquerque Center Roswell
257.600	Air combat manuevers (BEAK A MOA) (very busy)
256.700	Air combat manuevers (BEAK B MOA)
239.000	Albuquerque Center (hand off to Roswell ATC)
267.900	Various ACM coordination (BEAK C MOA)
375.200	ACM Talon MOA
324.300	Holloman AFB, Approach
299.300	Holloman AFB, Approach
255.900	Holloman Tower
284.000	Holloman Departure
289.400	Holloman Clearance Delivery
294.600	Cherokee Control WSMR
285.500	Albuquerque Center, El Paso, TX.
343.800	Albuquerque Center, El Paso, TX.
294.900	Holloman Tactical control
295.200	WSMR test support
324.300	Holloman AFB, GCA
339.300	Holloman AFB ACM training
372.900	Holloman AFB Clnc. Del.
342.200	WSMR control
320.100	Holloman AFB GCA

AFB	Air Force Base	MOA	Military Operations Area
ATC	Air Traffic Control	WSMR	White Sands Mobile Range
ACM	Air Combat Maneuver	GCA	Ground Control Approach
CP	Command Post		

anything that I could definitely identify as a new stealth aircraft. I had monitored F-117s from Holloman using the White Sands Missile Range, but the "Nighthawk" had long been brought into the "white" military world. In any event I had long given up any chance of seeing the TR-3A.

Instead, Elwood and I were concentrating getting the B-1s taking off, from Roswell (in full afterburner) on video. We were not disappointed. As the B-1s took off and flew directly over us, their awesome power was evident. The noise from their engines rattled our brains and was felt deep in our chests. At dusk the pure-blue afterburner flames were a sight to behold. I used most of the video camera's battery charge shooting the six departing B-1s. We decided to hang around a few minutes later to see if the A-6s or F-4s would be launching.

Things were very quiet, and I was contemplating calling it a day, when Elwood spotted the aircraft approaching us from the southwest. (I still haven't lived that down because I have always prided myself with having excellent eyesight and Elwood with his bespectacled eyes saw it first!)

Its slow and seemingly lazy movement suggested that the aircraft had been in the area for some time, possibly observing the B-1 launch. Ever so slowly it approached us, until it was in video range. It then made a slow right turn and disappeared into the darkening sky.

Excited, we rushed to our room to view the video. Needless to say I was a bit disappointed when I saw the fuzzy image on the TV screen. However we could make out that it wasn't a conventional aircraft and there was some hope that on return home the image could be enhanced by computer.

Best Guess

I sent a copy of the video (and digitized still photo) to *Jane's Defense Weekly* stealth expert Bill Sweetman. Bill studied them and came up with some possible specifications and capabilities of the aircraft.

Bill writes, "The video outline suggests two features: A relatively flat-bottom design, (logical in a high flyer) and a discontinuous kind of trailing edge. The latter is suggested by the very large depth change across the span coupled with the straight leading edge. Outer wings appear quite tapered; if it was more like a B-2, the wingtips would be more visible."

The following numbers are a scientific wild guess Bill came up with by doing a quick Vulcan comparison, together with range extrapolation from the Gulfstream IV:

Wingspan: 68 feet
Length: 40 feet
Take-off weight: 70,000 lbs.
Weight empty: 35,000 lbs.
Engines: Two GE F404, 11,000 pounds of thrust
Max speed: Mach 0.85-0.9
Service ceiling: over 60,000 feet
Range: 5,000 nautical miles
Operating radius: 1500 nm with 4 hrs on station.

"Interesting capabilities..." concludes Bill.

Selective Calling

Happy Holidays and welcome aboard. I am pleased to say that each week we receive at least 10 letters from newcomers to aero monitoring. The most frequently asked questions in regard to HF, are "What is a SELCAL?" and "What is that strange chiming sound I hear after pilots ask for a SELCAL check?" Here's what it's all about:

SELCAL (Selective Calling) is paging used to alert a specific aircraft when a ground station wishes to communicate with them. Each aircraft radio has its own four-letter code which a ground station can select to transmit a signal and activate the system. When this happens, a "bing-bong" (chime) sound is heard on the flight deck and an amber light flashes on the SELCAL equipment. In effect, this is telling the pilot to "pick up the phone!"

SELCAL equipment, as you've observed, can be used on both High Frequency (HF) and Very High Frequency (VHF). It is utilized by ARINC and company stations to communicate with aircraft aloft. When pilots ask for a SELCAL check, they must give the four letter code of their aircraft's SELCAL unit. Usually, there are two SELCAL units aboard and each must be checked separately.

H. Baughn

Airline company communications can be QSLed. See October's issue for QSLing Delta's communications center, pictured above.

Table 1: Air Force Aircraft Tale Markings

CODE	AIRCRAFT	UNIT, LOCATION AND COMMAND
AK	F-15/E, C-12, C-130, E3	3rd Wing, Elmendorf AFB, ALASKA, (PACAF)
AL	F-16, A/B/C/D	187TH FG, DANNELLY FIELD, ALA. (ANG/ACC)
BB	U-2 K135Q, T-38A	9TH WING, BEALE AFB, CA, (ACC)
CO	F-16/A/B/C/D	140TH FW BUCKLEY ANGB, CO. (ANG/ACC)
FW	F-16A/B/C/D	122ND FW, FT. WAYNE, IN (ANG/ACC)
IL	F-16A/B/C/D	182 FG, PEORIA, IL (ANG/ACC)
LF	F-15E, F-16	58TH FW, LUKE AFB, AZ (AETC)
NJ	KC-135	108 ARW, MCGUIRE AFB, NJ (ANG/ACC)
MC	F-16 A/B/C/D	56TH FW, MACDILL AFB, FL (ACC) OR
	F-15A/B	142ND FG, PORTLAND, OR, (ANG/ACC) PA
0A-10A		111TH FG, WILLOW GROVE, PA (ANG/ACC)
SA	F-16A/B/C/D	149TH FG, KELLY AFB, TX (ANG/ACC)
VA	F-16A/B/C/D	192ND FG, BYRD FIELD, VA (ANG/ACC)

SELCAL equipment is used by civilian airliners, some branches of the military, and is also found on some bizjets. Incidentally, on VHF you will only find SELCAL being used on the frequencies found within the band between 128.825 and 132.000 MHz. This is because most of the rest of the aero communications band is utilized by Air Traffic Control and they do not contact aircraft by using SELCAL.

A SELCAL code uses letters which are defined by the international phonetic alphabet; for example one code might be "Bravo, Juliet, Lima, Charlie." Once in a while, the same code is assigned to two different aircraft and you can imagine the confusion which results. Fortunately, it doesn't happen very often!

Flight Simulation

A couple of years ago, we introduced an aero shareware simulation called "JETSET" in the column. The simulation featured a 747 that you could take off, fly, and land at different airports around the country. Many of our readers sent diskettes to us for a copy of this sim, but quite a few of you claimed that, although JETSET seemed interesting, it was extremely hard to get the aircraft off the ground and somewhat difficult to use in other areas.

I am pleased to announce that it has now been revised and updated by its author; in addition, it's more user-friendly. JETSET has also been renamed "747" and the manual can be loaded onto your printer at the touch of a key. I've been playing with it and can vouch that it's working very well now. If you'd like a copy of this simulation, please send a 5-1/4 inch double-density (*not* high density) diskette along with a self-addressed stamped disk mailer (or $1 if you don't have a disk mailer) to me here at the magazine.

Incidentally, this sim can only be run on an IBM compatible pc; it has not been adapted for the Mac or Commodore as yet. Since it is shareware, there's no charge for the copy of the simulation. However, if you like it and plan to use it, there's instructions contained on the disk where you can mail a very small fee to the author of the sim.

Tail Markings

For those of you who are interested in spotting military aircraft as well as monitoring, Ralph Fellows contributed the above list of Air Force Aircraft Tail Markings. Since the list is rather long, we'll spread the listings out over several issues, beginning with Table 1.

Readers Corner

From the *San Diego Union*, via Alan Vigeant, comes the following item entitled "Squirrelly Radar": "Air traffic controllers say their new $839 million radar system has some gnawing flaws: planes vanish from screens, phantom images appear and even a wayward squirrel can chew up the net-

work. The National Air Traffic Controllers Association said the system could pose dangers in many places unless the bugs are eliminated. 'The controllers and the pilots make it work,' said the head of safety and technology for the controllers union. 'It's stretching the rubber band. Pretty soon it could snap. So far there have been no accidents caused by the system. There have been some close calls.'

"The system is called ASR-R, short for airport surveillance radar. It began operating in 1989 and is being used in 62 airports now, including eight military bases. The total, according to the schedule, will more than double by 1995. San Diego Terminal Radar Approach Control (TRACON) is scheduled to begin using the new system early next month."

NASA (National Aeronautics and Space Administration) has received many complaints on the ASR-9 at its Ames Research Center at Moffet Field, CA, home of NASA's aviation safety reporting system. Some of the complaints from their files include:

In Pasco, Washington, controllers said they were picking up ground traffic on their scopes, including what they believed to be a car backing out of a driveway.

The encounter with the squirrel occurred at Cleveland's Hopkins International Airport in August. Utility company officials said they believe a squirrel gnawed on a power line, causing a short that knocked out the radar system for more than a week. The airport relied on nearby radar towers until the Hopkins systems was repaired. In the interim, controllers said they were forced to operate with less than precise usual information.

Loggings

We have some good loggings to share with you, courtesy of Gordon Levine (CA) and Bill Battles (NH). First from Gordon:

11233	0405 UT	Trenton Military working Air Canada 230
13354	2010	Honolulu working Navy KT242
5547	0317	SF working ground maintenance from N474EV
13330	1715	Houston working Delta 57

And from Bill:

13348	2045	Iberia 380 working Santo Domingo
11330	2045	Lufthansa 7297 working Khartoum
6501	0147	CAMSPAC San Francisco & CGC Mariposa in p/p
8894	2345	Speedbird 57 working Algiers with position
8951	1043	Japan Air 63 working Tokyo
8933	0100	Springbok 269 wkg Johannesburg/5532 secondary
5643	1119	Qantas 25 working Sydney
7741	1058	CGC Mohawk wkg Golf 93 at 20.40N/150W position
8861	2115	Lufthansa 7266 requesting SELCAL check (FMDJ) from Dakar Radio

Airline Addresses

Continuing the list from October:

KLM Royal Dutch Airlines
P.O. Box 7770
Schiphol Airport
The Netherlands

Berne Radio
General Diretorate of Swiss PTT
Aeronautical Mobile Service
Laupenstrasse 18
CH-3030 Berne, Switzerland

New York ARINC
Aeronautical Radio, Inc.
613 Johnson Ave.
Bohemia, Long Island, NY
11716

Speedbird London
P.O. Box 10
Heathrow Airport
Hounslow, TW6 2JA, London
United Kingdom

Stockholm Radio
Swedish Telecomm Radio
P.O. Box 47322 S-100 74
Stockholm, Sweden

United Airlines
P.O. Box 66100
Chicago, IL 60666 USA

Virgin Atlantic Airways, Inc.
Sussex House, High Street
Crawley RH1 1BZ
West Sussex, England, UK

MGM Grand Air, Inc.
2250 East Imperial Hwy.
Suite 420
El Segundo, CA 90245 USA

South African Airways
South African Airways Centre
Box 7778
Johannesburg, SA

Sabena World Airways
35 Rue Cardinal Mercier
1000 Brussels, Belgium

That's it for now. I hope everyone who attended the convention in October enjoyed it as much as I did! May Santa be extra good to all of you this year.

See you in February. 73 and out, Jean Baker.

Kevin Carey, WB2QMY

Longwave Q & A

One of the things I enjoy most about writing *Below 500 kHz* is hearing directly from *MT* readers and helping them answer their questions relating to the low frequencies. This month, I've included a few commonly asked questions in the hopes that others may benefit from the answers. Let's begin!

Q) With the prominent shortwave operations of WWV, what does WWVB (60 kHz) offer that SW does not?

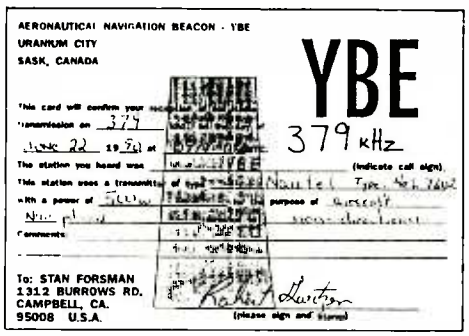
A) WWVB operates on a low frequency where *groundwave propagation* is the order of the day. Because of its ground hugging characteristics, the WWVB signal does not depend on ionospheric "skip," and is therefore unaffected by fading and other propagation anomalies that are so common to the shortwaves. When reliability is crucial, WWVB is the way to go.

Q) How are the longwaves affected by the 11-year Sunspot Cycle?

A) Unlike the shortwaves, the low frequencies actually benefit from reduced sunspot activity because of the quieter band conditions. With sunspot numbers dropping off after the late '80s peak, this winter could bring excellent longwave conditions. Be listening for some beacons you've never heard before!

Q) What are the LOWFERS, and under what authority do they operate?

A) LOWFERS is short for "Low Frequency Experimental Radio Station." The FCC rules permit the unlicensed use of a 1 Watt transmitter with a 50 foot antenna from 160 to 190 kHz. Despite these strict limitations, LOWFERS are sometimes heard more than 200 miles away under good conditions. *The Lowdown* (45 Wildflower Rd., Levittown, PA 19057) is an excellent source for news and technical topics relating to this experimental band. A subscription costs $18 per year.


AERONAUTICAL NAVIGATION BEACON - YBE
URANIUM CITY
SASK, CANADA

YBE

379 kHz

To: STAN FORSMAN
1312 BURROWS RD.
CAMPBELL, CA.
95008 U.S.A.

QSL received by Stan Forsman (CA) (YBE, 379 kHz, Saskatchewan, Canada)

Q) Is it possible to convert an LF wire-wound loop (such as the Homespun Loop-Sept. '92) for use on other frequencies such as the AM Broadcast Band?

A) Yes, although it's somewhat of a trial and error process. To tune the broadcast band, you'll need to remove turns from the main winding. For the Homespun Loop, try removing all but 13 turns on the main winding. If, on the other hand, you wish to lower the tuning range of a loop, you'll need to add turns (or use a bigger capacitor).

Q) How can I identify stations operating below 150 kHz?

A) Since most of these stations send encrypted data, I recommend a method suggested by VLF monitoring specialist Terry Krey (TX). The technique is to determine the exact frequency of the station, and then consult a reliable frequency list, such as the Grove *Shortwave Directory*. You can then cross reference the frequency and see who it's assigned to. On VLF, there are few cases of two stations being assigned to the same frequency.

The Other Shoe Drops

First, it was the abandonment of the 500 kHz distress frequency. Now, the Coast Guard has announced more big news regarding marine radiobeacons.

In its *Local Notice to Mariners*, the Coast Guard announced it is conducting a survey of existing beacons and will consider discontinuing those that are found to have low usage as well as those that will not support the transmission of Differential GPS (DGPS). Apparently, it is felt that other navigation systems (LORAN, GPS, OMEGA, etc.) are now available that can replace the beacons.

I have mixed feelings about the elimination of these marine beacons. While GPS has become popular among mariners due to its high accuracy, there remains one big problem—PRICE. I've yet to see any GPS receiver selling for less than $700. That's not exactly small change for a weekend boater. Even the less accurate LORAN system requires a hefty cash outlay.

On the other hand, a Radio Direction Finder (RDF) can be picked up on the second-hand market for well under $100 which will provide satisfactory homing service for most recreational boaters. In fact, a simpler system could be *more* useful for some users.

You see, GPS tells you *your current position* with terrific accuracy, but it doesn't physically point the way to your *destination* with the simplicity of an RDF pointer. I received a letter from Doug Robertson (Oxnard, CA) that pretty well sums it up. Doug operates a tug boat, called the *Seeker* that is equipped with LORAN, but he also relies heavily on beacons for safety and navigation. Doug writes, "The direct comfort of listening to the Morse Code and watching the pointer on the way home will be forever lost when the beacons are removed from service."

As it relates to DXing beacons, rest assured that there will still be plenty to hear. The FAA has hundreds of beacons in operation, and there are no plans at present to shut them down. The FAA considers the beacons to be important backups to other navigation aids and, in fact, they purchased 160 new microprocessor-controlled beacons (contract DTFA01-84-00064) in the mid '80s.

Loggings

This month's loggings are from Wayne Gregory of Richmond, KY. A relative newcomer to beacon hunting, Wayne has already taken his first DXpedition! He packed up his Kenwood R-2000 and traveled to Maywoods Environmental Laboratory (about 35 miles southwest of Lexington, KY). The quiet conditions there allowed him to hear the beacons listed in Table 1.

That wraps it up for another month. I'd like to extend the very best holiday wishes from my family to yours. Join me again in January for more longwave monitoring times! MT

Table 1: Loggings

FREQ	ID	LOCATION
238	GNI	Grand Isle, LA
307	R	Snug Harbor, ONT
329	YHN	Hornepayne, ONT
332	QT	Thunder Bay, ONT
338	LM	St. Louis, MO
341	YYU	Kapukasing, ONT
344	JA	Jacksonville, FL
362	LYL	Lima, OH
368	L	Toronto, ONT
391	DDP	San Juan, PR
392	VEP	Vero Beach, FL
413	YHD	Dryden, ONT
426	IZS	Montezuma, GA
515	OS	Ohio St. Univ.
518	YWA	Petawawa, ONT

LF Tip of the Month:

With the arrival of enhanced winter conditions, now is the time to try for distant Canadian beacons. Many of them run 500 watts or more and can make excellent DX catches.

The deal of the Season is here, and it's from GROVE!

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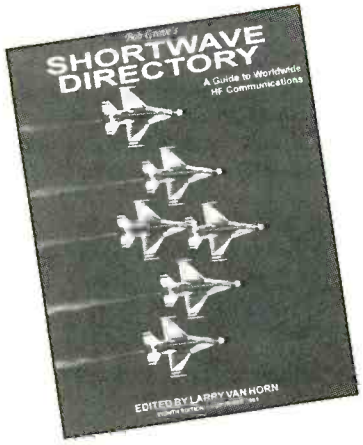
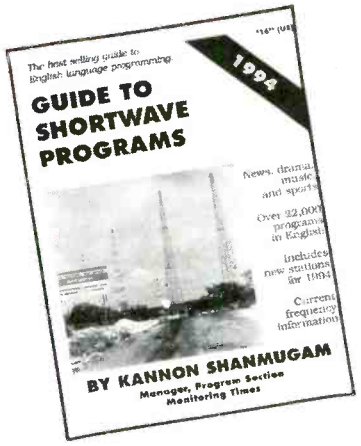
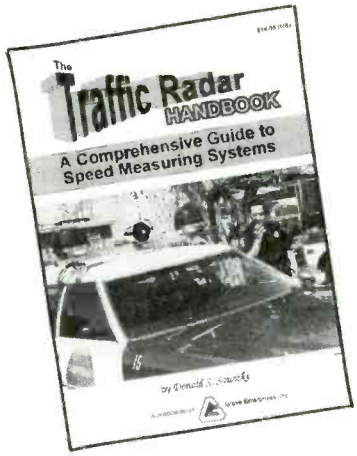


BOK-14 $29.95
8th Edition of the
Shortwave Directory



BOK-43 $16.95
1994 Guide to
Shortwave Programs



BOK-75 $14.95
The Traffic
Radar Handbook

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Talk About Rock 'N' Roll!

"There's nothing like doing live talk. There's an adrenalin high that can't be matched by being a disk jockey." You can feel the energy on *Allan Handelman's East Coast Live*, broadcast on five FM stations throughout the South, 10pm until midnight, every Sunday night. It's rock 'n' roll radio's answer to talk radio!

"I always felt a cause to support my generation. I still have a little bit of that 'peace and love' mentality in me from the 60s and 70s. The show was designed to help that segment—the Woodstock Generation, if you will." Allan understands his audience, because he's a part of it. Now 40 years old, he produces, hosts, and sells advertising spots for his syndicated talk show by himself.

"I get my ideas from watching and observing and reading. If I hear a new group, and I say 'This group is fantastic,' I don't wait for them to become a hit. I make contact with bands before they become household words. When they welcome help, I work with them. Then, when they become big, they don't forget me."

Handelman's greatest talent is uncovering unknown facets about everyone he brings to his microphones. "If you're going to get backstage with a band in an interview, you want to entertain your audience. You can't just ask them 'What was that song about?' The audience wants to know about their *lives*. If you ask personal questions, they're put off; but if you make it real easy to volunteer some personal information, you draw people out."

Sunday nights seem magical to Allan. "If you have somebody on Sunday night, it's unlike Monday, Tuesday, Wednesday, Saturday. On Sunday nights people are more susceptible and more willing to share personal beliefs and thoughts with you. I get celebrities to reveal things that I never thought they'd reveal."

Allan's show was smokin' with David Letterman.

Frank Zappa when Clinton called in to chat with them during his run for the presidency!

"When David Letterman got fired from his NBC morning show back in 1982, he was out of work, unhappy, and angry, and he did not want to do any interviews. The only reason he agreed to be interviewed by me was because we were the radio station who got people to petition Fred Silverman to fight the cancellation of his show. We had petitions being signed in high schools and record stores, and we were calling up NBC affiliates who weren't running his show. It got back to Dave that I was doing all this, and he rewarded me with an exclusive interview."

Allan's friendship with Letterman continues: "In 1986, I got the Governor of North Carolina to declare David Letterman Day, and he did! He wrote a proclamation and signed it, and NBC ran with it. It was in *USA Today*, and Letterman showed the proclamation on TV. Other comedians have visited Allan's airwaves: "One week we had Jay Leno on. We got into some interesting things about his regrets and how he might do things differently about taking over the *Tonight Show*."

Many other classic performers, like Carroll O'Connor, Mel Blanc, Ernest Borgnine, Vincent Price, and Jim Backus, were all amazed to discover legions of enthusiastic young fans during their visits on *East Coast Live*. Some of Allan's most popular shows are his "What ever happened to?...." series, where he tracked down and profiled old rock 'n' roll stars like Del Shannon, James Darren, and Dion.

No matter who the guest may be, the show always has a topical feel. "We deal with the issues of the day. This past week, I didn't have any specific guests. We dealt with the health care package and violence. People were really concerned about the violence in the streets and the car jackings and people going to highway rest stops and getting shot."

When Allan began his show in 1977, he was Program Director of a small rock radio station, WRQR in Greenville, North Carolina, and wanted to try rock talk as an experiment. Handelman grew up on Long Island, New York, where he listened to Boston's Larry Glick and his idol, WABC's Dan Ingram. Influenced by their two styles, Allan developed his idea and *East Coast Live* was born. Although the show has been on the air almost continually since, it has been on a variety of radio stations. Allan's career has taken him all over North Carolina, with a two year detour to Bakersfield, California, and his talk show nearly always went with him. *East Coast Live* returned to North Carolina, in its current form, on WRFX-FM in November 1992.

Radio programming syndicator Westwood One heard the show and admired Allan's interviewing talents. They arranged a contract with Allan to excerpt his rock interviews for use on their networks. WRFX owners, Pyramid Broadcasting of Boston, Massachusetts, followed up on the idea, and entered into a joint venture with Allan to syndicate his show via satellite. This is only the beginning! "There's no doubt about it. The show would work nationally. It would be a dream come true to be heard in New York where I'm from."

Although produced in the South, *East Coast Live* has very little regional tone. "I want the show to work everywhere, from Cincinnati to Charlotte." Allan devotes most of his time to promoting and selling his show, and it's paying off!

Along with creating his radio program, Allan enjoys DXing with a Realistic DX-440 shortwave radio and a Bearcat 200 XL handheld scanner. "I've loved DXing ever since I was a kid. My dad and I built a Lafayette Explorer shortwave radio in the 60s. I still have it, and it works! I'm really into pirates, because I used to be a pirate. I was 13 years old and I didn't really know I was violating laws. I remember getting a toy one Christmas: a Remco Caravelle AM transmitter, and I hooked it to some wire; and I had a FM transmitter I got from Lafayette, and hooked it to my TV antenna; and before I knew it I was on AM and FM all over my neighborhood!" Allan continued developing his skills at Concord College in Athens, West Virginia, where he established their first carrier current campus radio station.

Listen to East Coast Live on these stations:

WRFX	99.7	Kannapolis/Charlotte, NC
WZZU	93.9	Burlington/Raleigh, NC
WROQ	101.1	Anderson/Greenville/Spartanburg, SC
WGCX	104.1	Atmore/Mobile, AL and Pensacola, FL
WSFL	106.5	New Bern/Bridgeton, NC

Sunday nights: 10pm until midnight

Allan has helped launch the careers of many of the bands heard on the stations that carry his show. Tune in, and you'll often hear interviews with the band members of groups like Slaughter, Big Head Todd and The Monsters, Soul Asylum, Mötley Crüe, and AC/DC. The guest list doesn't stop with rock 'n' rollers. *East Coast Live* listeners have enjoyed spending time with David Letterman, Jay Leno, and even Bill Clinton. Allan was in the middle of an interview with

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.

Always on the cutting edge, Allan added Chevy Chase to his guest book last month. If you're within the sound of his voice, you can join in, too. Enjoy the best in entertainment, and the inside scoop about today's issues and rock stars. Tune in Sunday nights to Allan Handelman's *East Coast Live*!

Bits 'N' Pieces

• If you dig the blues, you'll love CBS Radio's new *House of Blues Radio Hour*. Hosted by Comedian Dan Aykroyd, as Elwood Blues of The Blues Brothers, the weekly show will present traditional and contemporary blues artists recorded in concert around the country. Artist interviews will be sprinkled between live on tape performances and news of blues musicians and their concert schedules. Daily mini-programs will also be fed to affiliates featuring three to five minute updates on a particular artist. *The House of Blues Radio Hour* is syndicated and available to any one station that desires it in a particular market; not necessarily a CBS Radio affiliate. For example, the series is heard in New York City on classic rocker WNEW-FM. Keep your ears open for the blues!

• Hello, America! He's Paul Harvey, and he's still number one in ratings. Five of the top seven radio programs in The United States are his, with over 6 million listeners tuning in each week. His long-term contract with ABC Radio is kind to his wallet. Paul rakes in over ten million dollars a year for his informative feature *The Rest of the Story* and his weekday news and comment programs. Howard Stern is the number two money maker, clearing 6 to 7 million a year, with Rush Limbaugh just slightly behind in earnings at number three.

Mailbag

• *MT* reader Pat Martin, in Seaside, Oregon, reveals some DX mysteries in the Caribbean. A powerful new station, "Radio Vision Christiana," appeared from early June and quickly disappeared in late August, broadcasting from the exotic Turks and Caicos Islands. Using 530 kHz, the Spanish-speaking station rebroadcast the programming of New York City's WWRV on 1330 kHz, confusing many DXers about its identity.

Another ace AM DXer, Mike Hardester, listening in Jacksonville, North Carolina, discovered why the station disappeared as suddenly as it came on the air. A friend of Mike's, who coordinates radio navigation beacons in the Caribbean, revealed Radio Vision Christiana was based at an old LORAN beacon site on South Caicos Island making use of its abandoned antennae. Their strong signals interfered with a beacon on 526 kHz at Stella Maris in The Bahamas, and other stations as far away as Canada. Radio Vision Christiana was forced to silence their transmissions until a solution to eliminating the interference could be found.

At almost the exact same time as Radio Vision Christiana left the air in late August 1993, another powerful religious broadcaster appeared, also claiming the Turks and Caicos Islands as their home: "Super Power 1020 Caribbean Christian Radio," using 1020 kHz. Elliot Straus, listening in Toms River, New Jersey, has heard them obliterating the signals of Pittsburgh's 50 kilowatt KDKA, that usually dominates 1020 kHz.

Since the beginning of October, Radio Vision Christiana has found a new home on 535 kHz, just 5 kilohertz away from their original frequency. Radio Grenada, broadcasting with 20 kW, has used 535 kHz for years, and listeners to stations on 530 and 540 kHz are now likely to hear an annoying heterodyne whistle from Radio Vision Christiana because they are broadcasting on a split frequency. A mystery of DXing has been solved...or has the story just begun? The long-term effects of this change remain to be seen.

International Bandscan

• As the sunspot count continues to fall, amazing DX is filling logbooks of AM listeners. Using a Drake R-8 with a Grove TUN-4 preselector/amplifier, and a bevy of Beverage antennae from his Seaside, Oregon, location, Pat Martin heard AM radio stations from Nepal, India, and Bangladesh during the morning of September 6th, 1993. Since then, Pat has enjoyed reception of stations from all over the Philippines, operating with as little as one kilowatt! Manila's DZMM, with 50 kilowatts on 630 kHz, occasionally bombs in like a local! Stations from Australia, New Zealand and Japan have become pests! The eleven year sunspot cycle will null in 1996 or 1997 when historic DX catches are predicted to occur.

• Austria's ORF has cut back the transmitting power of one of their medium wave outlets in Vienna. Their station broadcasting on 585 kHz, formerly operated with 600 kw, but is now operating at only 120 kW. A powerful German outlet in Langenberg, that carries WDR programming on 1593 kHz, is no longer in use during the daytime, according to DXer Hans-Peter Tillmann. This 800 kW transmitter continues to be heard widely by BCB DXers throughout North America between 0000 and 0500 UTC. Hans-Peter also reports that DLF's stations in Berlin on 1359 kHz, and Burg on 1575 kHz have closed down and will be decommissioned. Thanks to The British DX Club for our international information!

Until next month, Happy Holidays and Happy Trails!

MT

New Publications Review

Several new publications are available which can greatly enhance your satellite monitoring pleasure. The first is a new book from a long-time writer/publisher/manufacturer in this field. The second is a new magazine which is published by another industry giant and includes contributions by many recognized names in the TVRO industry. The third is a compilation of previously published items which makes a dandy reference book for satellite enthusiasts. I hope I've piqued your interest. Now, here are the details.

Satellite Radio Guide

The most significant of these publications is called *Tune To Satellite Radio On Your Satellite System* by Thomas P. Harrington. This 8-1/2" x 11", 100 page book sets out in detail how to receive SCPC, audio subcarriers, FM² (FM Squared),

weather satellite photos, facsimile press photos and much more. Published by Universal Electronics, *Satellite Radio* is reader friendly. You don't have to be a long-time TVRO hobbyist to understand this book. Lavishly illustrated with photos, charts, and diagrams, Harrington's book sets out in eight chapters everything you need to know about this exciting part of satellite monitoring.

The first three chapters detail the many methods for monitoring the analog FM subcarriers on the various video channels. Methods using old-style receivers, IRDs, communications receivers and scanners are given a thorough treatment. There are even blank SCPC and Subcarrier log sheets which can be easily reproduced, used to log your favorite channels, and kept by the satellite receiver for quick reference.

The fourth chapter, with the intriguing title "Other Interesting Services On The Satellites," is a fascinating explanation, in simple terms, of the various weather satellites. Here you'll learn how to set up your own Weather Facsimile (WEFAX) station to monitor GOES transmissions.

The fifth, sixth and seventh chapters deal with press facsimile transmissions, understanding the Automatic Transponder Identification System (ATIS), and a shopping list of necessary items to take full advantage of your satellite system.

The eighth chapter is actually a separate 8-1/2" x 11" insert numbering twenty pages. This is the *Satellite Radio Guide* which is updated quarterly; the latest version is packed with your copy of the *Satellite Radio* book. This is an effort to ensure that the relevant information, which is subject to constant change, can be updated without reprinting the whole book. To continue to receive additional updates, readers are advised to subscribe to the *Satellite Radio Guide* for $25 per year.

This last chapter/quarterly guide is itself divided into four sections. Section A is a satellite by satellite, transponder by transponder listing of all audio subcarriers from 5 to 8 MHz. Section B is a listing of all FM² channels (from .100 kHz to 5 MHz). Section C is a listing of all SCPC audio services on each of the satellites. Frequencies listed are for receivers which have a digital readout of the second IF from 50 MHz to 90 MHz. For those with the "relative" frequency indicators, these frequencies will provide a way to locate the channels desired by being able to identify transmissions nearby. And finally, Section D lists facsimile transmissions.

Getting Better

As great as this book is, there are a couple of things I'd like to see in future editions of *Satellite Radio*. First is an index. Virtually all publishers underestimate the need for an index. This is probably a result of being all too familiar with the material. Still, most readers appreciate being able to look up items of interest quickly without having to skim through the book each time. A complicated and thorough table of contents is no substitute for a good index.

Second, I'd like to see a listing of Digital Audio Transmission Services (DATS) such as those found on Alascom Aurora 2/GE Satcom C5 (139 degrees West). These feeds (93 of which are listed in the Westsat Communications' *Satellite Channel Chart*) are unavailable to the home dish market and it may seem pointless to include them. However, it is a great help to determine if services of interest, which can't be found among the analog listings, might be found among the DATS. There's always a perverse desire to see what we're missing.

Finally, it would be a more thorough work if it included more sources involving this subject. As an example, readers of *Satellite Radio* are not made aware through this book of the existence of the Heil SC-100 SCPC receiver, or of less sophisticated but useful methods of tuning SCPC such as the old TV band radio and the 70 MHz loop.

Still A Good Buy

Whether you're new to the satellite TV hobby or an old hand, *Satellite Radio* is full of valuable information to make the most of your TVRO monitoring. The book sells for $16.95 plus $3.00 shipping by Priority Mail. The *Satellite Radio Guide* update is an additional $25.00 per year. Order from Universal Electronics, Inc., Attn: Satellite Radio Guide, 4555 Groves Road, Suite 12, Columbus, OH 43232. Phone (614) 866-4605 or FAX (614) 866-1201.

Home Theater

There's a new magazine for the home audio/video technophile. Known simply as *Home Theater Magazine*, this periodical covers the growing field of home theater. Anyone who has ever seen video as delivered via satellite is amazed at the brilliance and resolution of the picture. Few cable companies bother to maintain the quality of the video, and over-the-air transmissions can't compare. But wait, there's more! The other side of satellite delivery is the incredibly rich audio. You've never heard audio from your TV set as delivered via a satellite receiver.

Now there are dozens of companies making all kinds of hi-tech equipment designed to enhance your living room viewing pleasure. It's now possible to enjoy the same stunning entertainment at home that you're used to seeing in the theater. *Home Theater Magazine* brings you up to date on all the latest video and audio equipment.

In their recent premier issue, surround sound amplifiers, 16:9 aspect ratio video screens, speaker systems and video projectors were reviewed. You'll learn all about these new products from long-time hands in the satellite industry such as audio expert Bob Heil. You'll also get great ideas for setting up your own home theater with impressive photos of expensive home theater installations.

Home Theater Magazine is published by Triple D publications which also publishes *OnSat* magazine, a TVRO weekly guide. A one year subscription is $19.95 from Home Theater Magazine, P.O. Box 2347, Shelby, NC 28151-9976.

The RTTY Listener

The *RTTY Listener* is a publication now in its eighth year, which is devoted to digital communications reception primarily in the high frequency (HF) shortwave spectrum. There have been, through the years, many excellent tips for the TVRO enthusiasts interested in expanding their knowledge of satellite communications. Bob Evans, editor of *MT's* new quarterly "Digital Digest" column, is a principal co-editor of the *RTTY Listener*.

The *RTTY Listener* is published in two volumes. The first is for issues 1-25 which covers June 1985 through December 1990. The second volume is for issues 26-30 and brings the reader up to September 1992.

The *RTTY Listener*, as a periodical, is published quarterly and is available only to purchasers of Universal multimode digital receiver interfaces. Those who haven't made such a purchase have to wait for the bound versions of the back issues. Still, they're very much worth the wait. The first volume is $19.95 plus shipping and the second volume is $6.95 plus shipping. To order the *RTTY Listener* write: Universal Radio, Inc., 6830 Americana Pkwy., Reynoldsburg, OH 43068 or call 800-431-3939 or FAX 614-866-2339.

NASA News

There was great disappointment in the weather satellite field as controllers lost contact with NOAA-13, the newest in a series of polar-orbiting weather satellites. Launched August 9 of this year, NASA says, "all battery charging aboard the satellite ceased at 3:45 p.m. EDT Aug. 21...Contact with the spacecraft during subsequent ground passes showed steadily decreasing battery voltages and currents...Output from the solar arrays continued to be normal...indicating a failure in the circuitry between the solar arrays and the batteries."

NOAA-13 was designed to monitor the Earth's ocean and atmosphere collecting meteorological and ocean data for direct transmission to users around the world and to the central data processing centers. The satellite was brought into service to replace NOAA-11 and NOAA-12 which were launched in 1988 and 1991.

1691 Downconverter Revisited

In last month's column there was mention, if not outright bemoaning, of the lack of inexpensive downconverters for 1691 MHz GOES WXSAT reception. For irrepressible tinkerers, Tom Glembocki, Editor of *WeatherSat Ink*, describes in the fall issue of that magazine the trials and tribulations of such a pursuit. Complete descriptions, photos and schematics of his efforts are detailed in that issue. This is not a publication for the faint-hearted. (See last month's column for a review of this journal.)

Those with the ability can get the necessary parts and instructions from WeatherSat Ink, 4821 Jessie Dr., Apex, NC 27502. The less stouthearted may buy assembled and tested units from RTP WeatherSat Co., Suite 202, 659 Cary Towne Blvd., Cary, 27511.

Sky Radio

Air passengers have lately noticed a new treat in radio listening called Sky Radio. Using a small antenna mounted on top of the aircraft's fuselage under a radar-type dome, the digital narrowband transmission is received and decoded with a proprietary receiver/decoder built for Sky Radio, a service of *USA Today*. The transmissions are sent via GStar 3, a Ku-band satellite at 93 degrees west. This is essentially a preview of things to come. Satellite delivered CD quality audio has been available to cable subscribers for some time. Within the next five years a satellite CD quality audio receiver will be optional equipment in many new cars. A switch on the dash will be flipped from AM to FM to Satellite. Dozens of formats and/or radio stations will be available and reception from coast to coast will be flawless.

SuperGuide

MT reader Bruce Gaskamp KB5MRP of Brenham, TX, is not happy with the way his favorite programs are apparently shifted around without notice. This is a common problem with as many satellite delivered programming services as are available to home dish owners. Printed satellite guides are often a month old by the time they get to the subscriber. Not only that, the information given to the guide by the programmer may not be correct or up to date either.

Bruce, there is one guide which has a Hi-Tech solution to this problem. It's called *SuperGuide* and is a satellite delivered data service using the data base of Triple D Publishing's *OnSat* guide. *SuperGuide* is basically a stand-alone modem/computer which receives a high-speed data stream from one of several satellites. This data is then ready for display on the user's TV screen using the *SuperGuide's* infra-red remote control. New information is transmitted daily and so any updates or changes which need to be made to any of the channels, will be changed at that time. The information you have that day will be the latest available. Additionally, full length articles, audio listings and much more are available.

That would be nice enough, but it's not all there is. The user may program the unit to display programs of special interest using a key-word search technique. These programs along with their dates, times, and channels will be shown on the screen. By hooking up your VCR to *SuperGuide*, the user can direct the satellite receiver to move to the proper satellite, channel, audio arrangement, and turn on the VCR at the same time to record programs you might otherwise miss.

SuperGuide is available as a stand-alone unit or built-in to certain satellite receivers. For complete information, including price and subscription rates write: SSC (Satellite Service Company), 1409 Washington Avenue, St. Louis, MO 63103 or call 314-421-0102 or FAX 314-421-5214. MT

Ike Kerschner, N3IK

The Amateur Antenna

One concern of many new amateurs is antennas. Many new hams do not have enough room for a "standard" antenna; others can not decide which antenna they should put up. And, should I buy or build?

I recommend you start with a simple antenna! Any wire will radiate a signal if you can "load" it. LOADING is the term for making a wire accept the output of your transmitter. The output of modern transmitters is 50 ohms. Therefore, ideally the antenna should be close to 50 ohms impedance. An antenna can be made to match the desired 50 ohms several ways.

Trimming for Length

The first is to cut the antenna to the length dictated by the standard formula, and then trimming it after it is put up (normally the frequency chosen will be at the center of the desired range of frequencies on which you want to operate). The reason for trimming is that seldom can we achieve the ideal conditions assumed in the textbook; consequently, it is best to cut the antenna a little longer than the formula says it should be so there is room to cut length off after it is put up.

Use an SWR bridge to measure the Standing Wave Ratio of the antenna at the transmitter. The ideal is a 1:1 match on the meter; any value under 2:1 is okay. Before we start the trimming process, though, check the high end and the low end of the band to see where the SWR is best. If it is best at the low end, you will need to trim length; if it is best at the high end, length needs to be added. Ideally the match should be under 2:1 at the band ends and close to 1:1 at the center.

Remember that it will be nearly impossible to cover an entire amateur band with less than 2:1 SWR on a simple dipole. A dipole antenna exhibits about 72 ohms impedance; consequently, if we choose to feed it with 50 ohm line, it will have a slight mismatch (1.25:1) at its ideal point. This is insignificant and nothing to worry about. If you desire full band coverage, read the ARRL *Antenna Handbook* (225 Main Street, Newington, CT 06111) for broad-banding techniques.

A second method of insuring a 50 ohm impedance is to use a matching section. A matching section is a length of feedline (of a particular impedance) added before the 50 ohm transmission line. Matching sections is a very involved subject and cannot be covered in detail here. Again, I suggest obtaining a copy of the ARRL *Antenna Handbook* and reading the sections on matching.

A third method involves the use of a transmatch. A transmatch is a device that uses inductor (coils) and capacitors to allow the operator to fine tune the impedance of a given antenna to the output of his transmitter. You can build a transmatch or purchase one of the many commercial units available. I strongly urge the use of a transmatch with modern transmitters. With a transmatch it is possible to use almost any kind of wire or conductor as an antenna.

Whis is Best?

A simple length of wire will allow you to get on the air and have fun. However, as interests change you may want to move on to other types of antennas. Here is a list of the most popular.

Half-wave dipole

This is a good general purpose antenna, which can be fed with coax or high impedance line. When fed with coax, the dipole is basically a single band antenna. Using high impedance line (300 to 600 ohm), it becomes a multiband device. The dipole does a fair job on DX, but is better for domestic communications.

Depending on the band of choice, the dipole can be difficult to erect because of the lengths involved. This problem can be alleviated somewhat by installing the dipole as a "drooping dipole," elevating the center point as high as possible and drooping the legs in a "V." Keep this inverted vee angle greater than 45 degrees to avoid loading problems.

Vertical

Normally one quarter wavelength long, the vertical provides good low angle radiation for DXing. The vertical is a bit more difficult to load, and does require a good ground system or radials to be efficient. Vertical antennas are noisier than horizontal antennas (most electrical noise is vertically polarized). Longer vertical antennas (e.g., half and 5/8th wave) do not require a large ground system, and provide even better low angle radiation for DXing.

Vertical antennas are not very efficient for domestic communications; the low angle causes the signal to skip over nearer stations. Quarter wave verticals are easy to install, although they do require good ground systems. One-half and 5/8th wave verticals present mounting and matching problems but are superb DX antennas.

Full wave loop

An excellent antenna if you have the room. The antenna has a circumference of one wavelength at the desired frequency. It can be put up as a square, triangle or some combination of the two. Depending on where it is fed, it can provide superb low angle radiation for DX work, or high angle for domestic use. In addition, the loop cancels a lot of manmade noise.

Beam antennas

This is a generic term given to a type of antenna that provides high gain and directivity as well as excellent low angle radiation for DX work. Normally constructed of aluminum tubing and rotated with a motor, they can be made of wire. A good reference is the *Beam Antenna Handbook* by Wm. Orr, W6SAI.

Beam antennas present a wide range of matching and erection problems, but not beyond the ability of the average amateur. Some wire beam antennas are extremely effective and will even outperform the aluminum rotary beam.

Multiband antennas

There are many multiband antennas on the market. Most of the vertical and beam antennas use traps (coil and capacitor combinations) to obtain multiband coverage. Trap vertical and beam antennas are fine and any brand will do an excellent job. I advise staying away from "trap" multiband dipole antennas: trap dipoles provide only dipole coverage on each band, and losses in many traps are excessive.

There are several non-trap multiband antennas that provide gain and wider band coverage and better efficiency than the trap dipole at lower cost. In fact, some very simple multiband wire antennas provide gains higher than many expensive beam antennas.

Build or Buy?

The choice is entirely up to you. If you have the time and tools, by all means build your own. Home made antennas will work as well as the similar commercial unit if you take your time and do it right, and are usually less expensive. On the other hand, in today's busy world, it is often very difficult to find the time to roll your own. Be aware, though, that many commercial antennas are overpriced! Take the time to shop around, read the specs and ask questions. The most expensive antenna is not always the right choice! Several manufacturers have unique antennas that are inexpensive and perform in an outstanding manner.

This is far from the full story on antennas. As you progress in radio, your antenna needs will change (and probably increase). *Monitoring Times* and the other radio magazines are good sources to keep informed. Purchase antenna books and try different types and styles of antennas and matching ideas. It can be a fun hobby within the hobby.

Rob Kenoul's

Ham DX Tips

Merry Christmas to one and all! Is there a better time of the year to log Christmas Island? There is nothing like logging a rare one to provide holiday relaxation; it works for me! Here are some tension breakers for you:

CHRISTMAS ISLAND W5KNE, Bob Winn, noted DXer and publisher of the *QRZ DX Bulletin*, will be active once again as VK9XN. Bob will be here from 27 November to 15 December operating CW and SSB all bands, but with special attention to 80, 40, and 30 meters. Bob will announce his QSLing arrangements during the operation. ***DJIBOUTI*** J28RD (P.O. Box 3321, Djibouti, Africa) can be found on 18124 kHz SSB at 1900 UTC. ***ERITREA*** The ARRL DX Advisory Committee voted to reinstate Eritrea to the DXCC countries list effective 24 May 1991. The prefixes currently in use are: 9E, 9F, and E3. Those hams having made contacts made after the effective date should wait until 1 January 1994 to submit their cards for DXCC credit. Those who worked this country prior to its deletion in 1962 and who had credit for the same, will be automatically credited in their DXCC totals. Eritrea was annexed by conquest by Ethopia, but has regained its independence after a long war with Ethiopia. ***DX NETS*** UN9LX (Yuri V. Funkner, P.O. Box 1, Frunze 45911, Ordzhonikidzevskiy, Rayon, Kustanayskaya Oblast, Republic of Kazakhstan) is the host of the "Nightly DX Net." Participants are mostly hams operating from many of the former Soviet Republics. The net meets on 7200 kHz at 2300 UTC Fridays listening for North American stations. ***GUANTANAMO BAY*** Jim Green, KG4DX, is active from this US Naval base on Cuba's East Coast, which counts as a separate country since it has been completely isolated from the rest of Cuba for the last 30+ years. You can find KG4DX on 7001 to 7005 kHz CW at 0230 UTC weekends. QSL to Ima's QSL manager, Dave Wester, K0IEA, 10205 217th St. North, Forest Lake, MN 550525. ***ISLE OF MAN*** There are two chances to log this island in the Irish Sea. GD4BEG (E M P Farrant, Saintsbury, Grove Mount, Ramsey, Isle of Man) has been active on 1835 kHz CW and some SSB at 0300 UTC. GD4PTV (Brian W Brough, Kimmeragh View, Ballacorey Rd, Bride, Isle of Man) has been appearing on 3800 kHz SSB at 2330 UTC daily. ***JAN MAYEN*** It may sound like someone's name, but it is actually an island located North of Norway. You can add this one to your logs by checking 3795 kHz SSB as early as 2200 UTC and sometimes as late as 0500 UTC. His QSL manager is Mathias Bjerrang, Svalbard Lufkaven, Postboks 498, N-9170 Longyearbyen, Norway. ***MIDWAY*** Scott Richardson (whose QSL manger is W100, Landean Bailey, 224 Holmes Rd, RFD 2, Scarbrough, ME 04074) will operate as KH4/N7TNL until January 6th. You can locate Scott on the following frequencies. SSB: 7096 (listening to 7236 kHz), 14236, 18136, 21336, 24936, and 28336 kHz; CW: 1836, 3536, 7036, 10136, 14036, 18096, 21036, 24896, and 28036 kHz. Scott is active as his duties here permit, so check these frequencies when propagation is "in" from Northern Europe. ***PITCAIRN ISLAND*** From the Pacific you can log VR6ID, Irma Christian, who is a direct descendent of Fletcher Christian of *Mutiny on the Bounty* fame, meeting N6IBP Mondays at 1600 UTC on 21290 kHz SSB. Irma's new QSL manager is NZ9E, David Miller, 7462 Lawler Ave., Niles, IL 60648. ***SOUTH SHETLANDS*** It's a frozen climate, even though located in the Southern Hemisphere. Operating from CIS (former Soviet) research base here, is 4K1F (QSL to Dniepropetrousk 320018, Ukraine) appearing on 10102 to 10105 kHz CW at 0300 UTC daily.

Well, that ends it for another year of DX tips. Have happy and safe holidays. 73 de Rob

'Tis the Season

HF DX season is upon us. In the northern hemisphere the lower frequency bands are hopping with DX signals due to the quiet band conditions (no thunder storms). What's different this season (1993-94) is the amount of DX appearing on 80 and 40 as well as 160 meters. As sunspots decline, conditions on our favorite DX bands (20, 17, 15, 12 and 10 meters) are fairly poor. As a result, more DX stations are moving to the lower bands.

Of particular interest is the large amount of DX on 160 meters. In fact, even during August much European and Mideast DX was being worked on this band, and things can only get better as winter progresses. Watch for Pacific and Asia after midnite local times; spring and fall are the best times to work the antipodes. (Yes, low band DXing requires some sleep loss!)

OBRA

Before last fall's hurricane season 93 I received a letter from Jeff Mutter in NC with a request I want to share with you.

"If you have a NC map handy, look for Dare County along the coast. The county stretches for 90 miles north to south. Hatteras Island is about 60 miles long and as narrow as 1400 feet in some spots. There are only two ways on or off the Island: a bridge at the north end, and a ferry at the south.

"Public safety and commercial communications on Hatteras are linked to the rest of the state by a combination of microwave and landline.

"OBRA (Outer Banks Repeater Association) is working to install a repeater in the Buxton area to assist in emergency communication. We can use any help your readers can lend."

Since I know the area Jeff is speaking about fairly well, I understand the reason the OBRA is anxious to get a good working repeater in operation. While Hatteras is a fairly remote area, it is not unpopulated. The frequent hurricanes often do extensive damage to the area, and hams are indeed the only link to the outside world under such conditions.

For more information about OBRA and to offer your help, contact Harry Bridges, PO Box 907, Manteo, NC, 27948.

That's all for 93, gang; best of the Holidays to one and all—see ya in 94.

73 de Ike Kerschner, N3IK MT

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EXCELLENCE IN ENGINEERING

George Zeller

Cuban Clandestine "Ratings" Claimed

What is the actual size of listening audiences for unlicensed pirate and clandestine radio stations? This interesting but under-researched topic was among the many issues that came up at the 1993 *Monitoring Times* Convention in Atlanta. Nobody has systematically estimated the number of persons who listen to pirate broadcasts, but most observers assume that the figure for any particular broadcast is typically a few dozen.

Even among licensed shortwave international broadcasters, the state of the art in audience research is fairly crude. A couple of organizations with large governmental budgets, notably the **BBC** and the **Voice of America,** have consistently engaged in audience research that produce roughly valid audience size measurements. **WRNO** has occasionally surfaced in commercial Arbitron ratings statistics. However, our knowledge about the shortwave listening audience is suprisingly imprecise. We know even less about the composition of audiences for unlicensed broadcasters.

An interesting exception to this pattern has surfaced. *MT* reader Mark Seiden of Miami, FL, forwards an October 12 *Miami Herald* profile of anti-Castro stations that are based in southern Florida. The newspaper asked recent Cuban immigrants to Florida about their former radio listening habits in Cuba. The *Herald* also cited ratings figures that were provided by the USA government's Office of Cuba Broadcasting, which operates **Radio Marti** and **TV Marti.**

Both sources claim that the most popular station in Cuba is Radio Marti. Several Spanish language Miami commercial stations (such as WQBA) garner the next few spots in the alleged Cuban ratings. Clandestines such as **La Voz de la Fundacion** and **La Voz del CID** are supposedly next on the list.

The reliability of these estimates is open to question. Domestic Cuban broadcasters, which certainly command a substantial audience share within Cuba, are omitted entirely. The sample in both "ratings" sources is composed of persons who either oppose Castro or who have fled Cuba. Both the Cuban refugees and the Office of Cuba Broadcasting have axes to grind that certainly suggest bias in their numbers. Despite this, the claims are interesting. At least somebody appears to listen to the flood of Cuban shortwave clandestines that we hear every day.

Mas and the CIA

The *Miami Herald* article prints another fascinating allegation. Jorge Mas Canosa of Miami, who chairs the Cuban American National Foundation, openly aspires to replace Fidel Castro as the chief executive of Cuba. He also heads the Radio Marti advisory board. According to the newspaper, Mas formerly worked for the CIA as an announcer on the historic 1960's clandestine **Radio Swan.**

Veteran DXers will certainly remember this station, later renamed **Radio Americas.** It was a covert CIA voice during the Cuban Bay of Pigs invasion.

Interestingly enough, the *Herald*, the refugees, and the Office of Cuba Broadcasting failed to mention **Radio Caiman.**

This mysterious anti-Castro station still blasts away nightly on 9965 kHz with an excellent signal. No organized group takes credit for Caiman. We still have no address for it. Many speculate that the station is operated by government intelligence agencies. Hmmm...

Other Clandestines

The **Voice of Human Rights and Freedom for Iran** is another clandestine that many suspect to be a USA government operation. Our regular reporter Rob Ross of London, Ontario, reports good reception of their relatively new 9350 kHz frequency at 0300 UTC. ANARC's Rich D'Angelo of Wyomissing, PA, finds that full schedules and QSLs are available from the station via 18 bis. rue Violet, Paris 75015, France. This one used to use an identification of **Iran's Flag of Freedom Radio.**

If you are interested in (or repelled by) the **Voice of Freedom,** Woody Smith of Knoxville, TN, points out that the Canadian newsmagazine *Maclean's* ran a full page profile of Ernst Zündel a couple of months ago. Check out page 56 of the August 30 issue. It features a striking color photo of this fascist commentator. The clandestine's programs are relayed via **WRNO** on 15420 kHz at 2100 UTC Sundays.

Europirates

With the annual return of winter propagation, reception of European pirates in North America is improving. For instance, Ross Comeau of Andover, MA, reports that he hears **Radio Caroline** on the 49 meter frequency of 6295 kHz around 0245 UTC. The 6200-6350 kHz 49 meter pirate band is a good place to search for Europirate signals, especially if you live in eastern North America.

This month's North American pirate loggings indicate that **Romantic Space Radio** has returned with more relays from this hemisphere. I have never seen North American loggings of pirate transmitters that are actually located "within Russia." If you would like to attempt a new feat in DX history, Stanislav Mekhonoshin of Perm, Russia, provides some information. He says that **Green Music Radio International** now uses 3020 kHz to supplement its 49 meter transmitter. **Radio Black Sea International** has changed its name to **Radio 75,** but it uses 49 meters, not 75 meters. In case you get very lucky, GMRI's address is Box 65, Moscow 125581, Russia.

What We Are Hearing

North American pirate activity continues at a consistent pace. John Knight of Fort Smith, AK, notes that Israel's service on 7465 kHz blocks this heavily used new pirate frequency in the late afternoon. In fact, many other powerhouse broadcasters still dominate various out of band frequencies on 41 meters, but pirates are still squeezing between the big signals.

Maildrop correspondence addresses used by stations listed here this month include PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 605, Huntsville, AL 35804; PO Box 293, Merlin, Ontario N0P 1W0; and PO Box 29, Moscow 109444, Russia. Several *MT* readers pointed out that a typo caused the incorrect box number for the Huntsville drop to be printed in the September issue; we apologize! The correct box number is **605.**

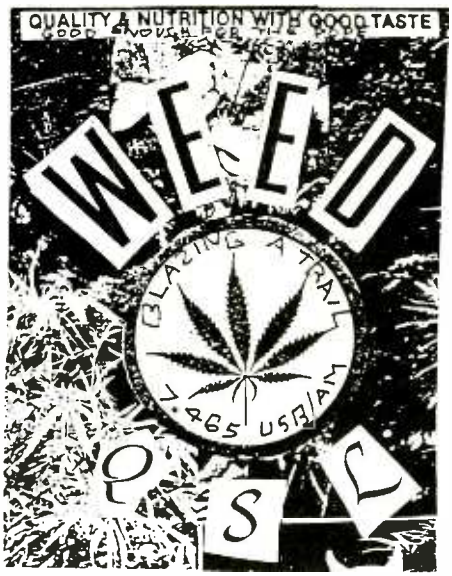
Altered States Radio- 7415 at 2345. Their format generally features long cuts of hard rock music with occasional announcements. Look for the "Outer Limits" TV show theme at sign-off. Addr: Merlin. (Ross Comeau, Andover, MA)

Ground Level Network- 7465 at 2345. "Just Bob" calmly delivers health tips on everything from proper diet to adequate sleep habits to avoiding poison ivy. Addr: Wellsville. (Gary Johnson, Littlefork, MN)

KMCR- 15048 at 2315. Magic Mike at "Magic Carpet Radio" has been testing on both 19 and 41 meters with EZL music and frequent IDs. His signal is getting out over longer distances. Addr: Blue Ridge Summit. (Paul Roales, Tulsa, OK; and direct from the station)

Midnite Radio- 7470 at 0200. Ross had a great catch here, since Maxwell Silver's station operates on a fairly sporadic basis. When they're on, he usually announces a phone number for listener calls. Addr: Blue Ridge Summit. (Comeau)

North American Pirate Relay Service- 6295 at 0430. This one is quite active as a relay of other pirates, but it sometimes has its own music shows. Note the unusual frequency, which William says was subject to



After long delays, WEED now QSLs.

annoying utility station QRM. Addr: Wellsville. (William T. Hassig, Mt. Prospect, IL)

Omega Radio- 7465 at 0230. Dick Tator's Christian hard rock music, rap tunes, and "Spirit in the Sky" interval signal is on regularly again. Dick airs tests, program broadcasts, and QSOs, usually in upper sideband mode. Addrs: Wellsville and Blue Ridge Summit. (Robert Ross, London, Ontario; Comeau)

Radio Azteca- 7410 at 1330. Many feel that Bram Stoker's clever DX program parodies represent the best new pirate station of this year. Look for his interval signal from the Rocky and Bullwinkle show. Addr: Wellsville. (Comeau)

Radio Blandx- 7410 at 2315. If you like Don Moore's "BLANDX" parody of NASWA's *The Journal*, then you'll love Ralph Jensen's and Don Perry's hilarious radio version. Addr: Blue Ridge Summit. (Comeau)

Radio Fluffernut-7465 at 0305. This one is a pleasant rock music operation. Its most distinguishing characteristic is its unusual station name. Addr: Merlin. (Comeau)

Radio Gumby International- 7465 at 0145. A new operation, hosted by Master Gumby, mixes rock music with typical antics by Gumby. Addr: Merlin. (David Bland, Columbia, SC; John Knight, Fort Smith, AR; Comeau)

RFM- 1620 at 0300. H.V. Short's veteran pirate is noted for a mix of melodic rock and low key humor. He appears on various frequencies in the 49, 41, 31, and 19 meter bands. Recently he has been experimenting on medium wave. Addr: Wellsville. (Comeau)

Romantic Space Radio- 7465 at 0100. Arty's station is the only genuine Russian pirate that has a relationship with North American relay transmitters. Even if you're not an avid pirate DXer, this one is a fascinating catch. Addr: Moscow. (Comeau)

Solid Rock Radio-7465 at 0215. As the name implies, Dr. Love spins rock tunes. But, he mixes in unusual sound effects, country music, a mailbag segment, and various other features. Addr: Wellsville. (Michael Prindle, New Suffolk, NY; Comeau)

URGZ- 7470 at 0400. Their station format is wide ranging, with a mix of wry sketches on human relationships, football sports coverage, and music with rock, country, and novelty styles. They sometimes jump frequencies during broadcasts. Addr: None, but verifies logs in the *ACE* bulletin. (Gigi Lytle, Lubbock, TX)

Voice of Laryngitis- 7416 at 2300. Genghis and Stanley Huxley are celebrating Laryngitis' tenth anniversary of pirate broadcating. Their original and elaborate comedy sketches put them in a class by themselves on the SWBC bands. Addr: Wellsville. (Comeau)

Voice of Stench- 7465 at 0000. Eddie Egghead Johnson is relatively active again with rock, sketches, and instigation of bootleg QSOs with other pirates. Addr: Blue Ridge Summit. (Prindle)

WEED- 7465 at 0245. Their slick productions of rock, comedy, and drug advocacy are still heard regularly. The big news here is that the Huntsville 'droperator reports that WEED is now vigorously responding to reception reports with QSLs! Addr: Huntsville. (Johnson; Bland; Lytle)

Wire Line Radio- 15042 at 0030. Michael Prindle is pleased to report that he received *two* QSLs from them. Gigi nabbed their interesting mechanical logo that is pictured here. Addr: Blue Ridge Summit. (Prindle; Lytle)

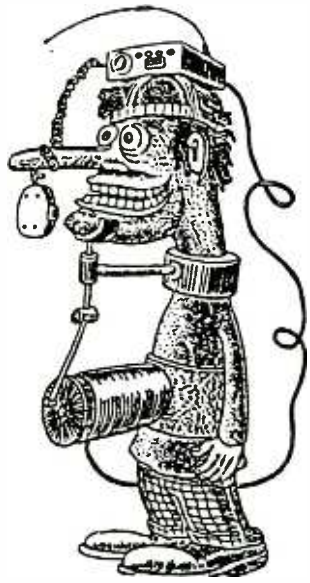
WJLR-7465 at 0245. The staff at "John Lennon Radio" has been experimenting technically through broadcasts in double sideband mode, with modulation on both upper and lower sidebands, but no transmitted carrier. Addr: Blue Ridge Summit. (Prindle; Comeau)

WLIS- 7410 at 1500. Jack Boggan features genuine interval signals from licensed shortwave broadcasters. My favorite is the old Radio Prague IS, which you can't hear anymore on 7435 kHz. Addr: Blue Ridge Summit. (Comeau)

WRAR- 7415 at 1330. Rock music dominates their programming, but recorded comedy bits are sprinkled in. Their maildrop reports that the station actively responds to listener reception reports. Addr: Huntsville. (Comeau)

MT

WIRE LINE RADIO



The No Metal, No Rap, No Crap, Pirate II On Your 41, 19 Meter and MW Dial

Wire Line's new logo from Mike LeClerc.

International Broadcasts on Books and Literature

By Ron Tamburello

Winter is the best time to cozy up to a crackling fire with a good book, oblivious... or at least carefree of the three feet of fresh snow just beyond those protective walls. (And yes friends, it snows here in California, too!)

But alas, the shortwave receiver is dark and silent, and that fact insidiously torments your brain: you are missing something important, perhaps a once in a life time broadcast or a new country for the log. And so it goes, gnawing at the back of your mind and ruining an otherwise good book. You may as well be trying to read with a headset plugged into your receiver, a first-class conflict of interest... or is it? Hmmm, how about putting the two together for a new experience? What if we...

Participate in an audio book club? Nonsense? Radio Moscow doesn't think so, and as evidence broadcasts a daily program entitled, coincidently, the *Audio Book Club!* Now all you need to do is get your receiver near that reading chair and you are all set!

Beginning just after the news headlines on the half-hour, the *Audio Book Club* focuses on classical, as well as modern Russian writing. The program's format is a 30-minute reading from a selected title, after a brief introduction of the work and its author. A recent series profiled the writing of Anton Chehkov, and brought the characters of the respected master of the short story to life! The program can be heard at numerous hours during the week, beginning Sunday at 0130, 1130 and 2330; Monday at 1030, 1430, and 1730; Tuesday at 0330, 0830, and 2330; Wednesday at 1130; Thursday at 0330, 0830, 1430 and 2330; Friday at 0430, 0630, 1130 and 1730; and finally on Saturday at 0330, 0830 and 1430.

All times are Universal Coordinated Time (UTC), and broadcast frequencies are referenced in the Shortwave Guide further back in the back pages of this issue.

The British Broadcasting Corporation (BBC) offers a wide selection of programs focusing on books and literature, perhaps the most extensive of all international broadcasters. For starters, *Off the Shelf* is a serialized reading of notable books from a broad range of topics, and can be heard Monday through Friday at 0430 and again at 1430. A recent series featured short stories from around the world.

Short Story is a similar program that focuses specifically on the shorter prose format and adds additional scope to the range of material offered. Recent readings have featured tales from Nigerian authors. The program can be heard on Saturday at 0130, and on Sunday at 0430 and 0915, except on the first weekend of the month.

Book Choice selects a recently released book, provides a short review of its contents and scope, and is usually followed by readings of selected excerpts from the text. *Book Choice* is aired Wednesday at 0425, Thursday at 0140, and Saturday at 2310. Finally, there is *Good Books*, a program that makes recommendations of books to read by providing in-depth reviews usually in a discussion format. *Good Books* can be heard on Wednesday at 1445 and 2315, Thursday at 0815, and Saturday at 0415. A recent series on this program profiled famous women characters in classic fiction, notably among them Emma Bovary from Gustave Flaubert's *Madame Bovary* and Elizabeth Bernet from Jane Austen's *Pride and Prejudice*.

Going one step further, the BBC also offers the *Play of the Week*, which can he heard after the news headlines on Sunday at 0100 (begins at 0030 once monthly, usually at the end of the month), 1130 and 1830. This 60 to 90 minute immersion into the depths of fictional lives

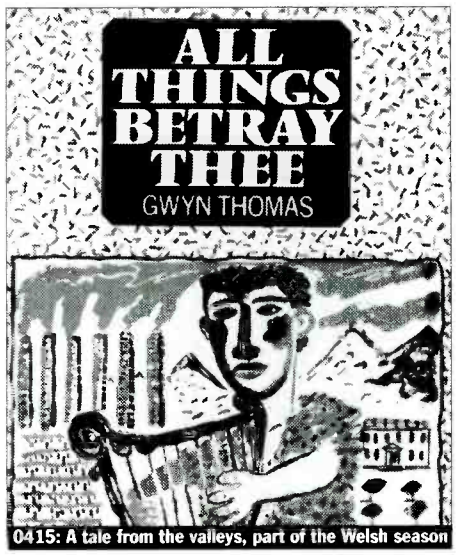
Spanish Foreign Radio, or, Radio Exterior de España, Madrid, English language broadcast staff.

enables one to personally get involved with the characters, and harkens back to the days of radio plays before the advent of television. This splendid and most welcome program is one of the few sources remaining for this type of production. A dramatization of Friedrich Dürrenmatt's short story, *A Dangerous Game*, was among the plays recently produced.

Following along the same lines is the BBC's *Drama*, a weekly half-hour program that also contributes to the genre of the radio play. Among recent productions was Runyon's *Guys and Dolls*. The program is aired Thursday at 1130 and 1715, and Friday at 0230.

Coming to us from Europe, Spanish Foreign Radio's weekly program *Cultural Clippings* (part of *Panorama*) is not strictly devoted to books and literature, but reviews subjects across the spectrum of the arts. A recent broadcast, however, profiled a number of new books from Spanish and South American authors. The program can be heard on Thursday at approximately 0035 and repeated again at 0135.

Voice of America (VOA) offers the program *American Stories* on its Special (slow) English broadcasts to Asia on Friday 2245, repeated Saturday 0045, 1345, 1645, and 1845 (Africa service). Although intended for listeners for whom English is not a first language, the slow readings are not a significant deterrent to the material presented. Recently offered was Arthur Davis' short story, *How John Boscoe Outsung the Devil*.



Taken from the Lawrence And Wishart edition

0415: A tale from the valleys, part of the Welsh season

The BBC highlighted this book, a tale from the Welsh valleys, which was part of an entire season devoted to Welsh literature.

Radio Budapest International has an audio book program entitled *Bookshelf*, which airs during its Tuesday and Friday broadcasts, October through January. December will feature short story favorites from the 1993 *Bookshelf* series. Look for *Bookshelf* within the latter half of Budapest's hour-long broadcast at 0200-0300 UTC.

Radio Australia reads from Aussie novels in *Book Reading*, Saturdays at 0413 and 0713, and Sundays at 0110 and 0310.

Exposure to the world's classics would not be complete without a sampling from religious texts, and among the numerous Christian oriented broadcasters, HCJB in Quito, Ecuador, offers weekly devotional readings from the Bible and other selected works. HCJB's *Radio Reading Room*, heard on Saturday at 0630 and 1530, recently profiled Peter and Barbara Jenkins' *Walking West*.

Book reviews, readings and interviews with worldwide authors are a welcome contribution to international broadcasting, as once again the shortwaves provide unique and insightful programming not readily available elsewhere. While the programs mentioned here are only a sampling, tuning around the dial will reveal all manner of treasures to add to your literary endeavors! Pay attention now, your book review will be due next week...

the qsl report

Gayle Van Horn

A Friend Returns to Shortwave

After an absence of three years, due to civil unrest, Liberia's Christian station Radio ELWA has resumed broadcasting. The station's address is; ELWA, Box 10-0192, 1000 Monrovia 10, Liberia, West Africa.

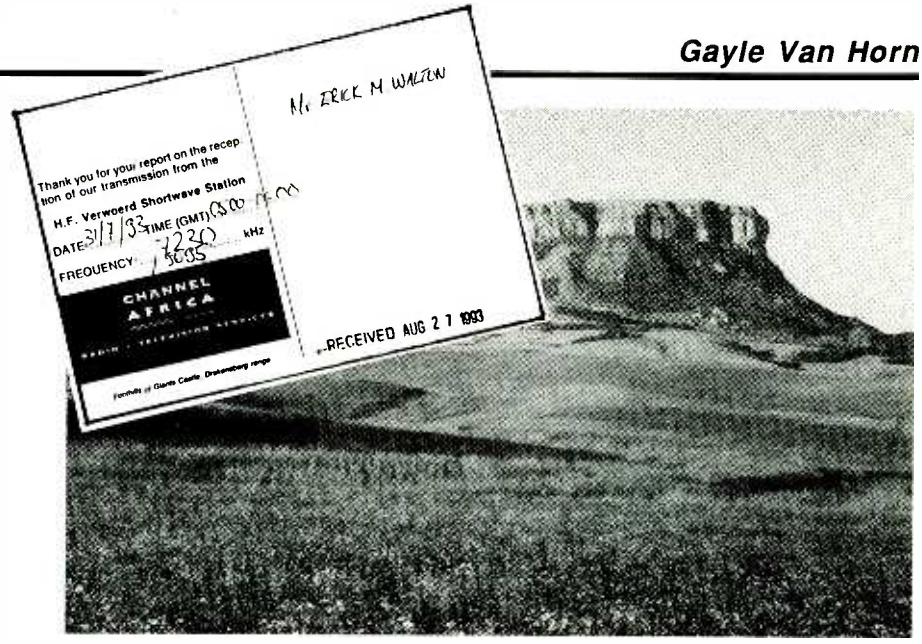
For Asian DXers, the new address for Radio Veritas Asia is: P.O. Box 2642, Quezon City, Philippines.

Don't forget Radio Slovakia International continues to seek listeners' reports and letters. Send to; External Services, Mytna 1, 81290 Bratislava, Slovakia.

For three IRCs, you can receive a Radio Centras QSL. All correct reports will be verified via; P.O. Box 1792, Vilnius, Lithuania.

This month's most sought after address is Channel Africa. Send your report and return postage to: P.O. Box 91313, Auckland Park 2006, South Africa.

Happy Holidays from QSL Report!



Erick M. Walton of Vancouver, British Columbia, is very proud to have received this Channel Africa QSL.

AIRSHIP

GOODYEAR BLIMP-*STARS & STRIPES*-N3A, 132.0 MHz. Full data prepared QSL card verified. Received in 16 days for an English utility report and first class U.S. postage. QSL address: Goodyear Tire & Rubber Co., 1144 East Market St., Akron, OH 44316. One of my most wanted QSLs-been trying for years to QSL the Goodyear blimp! (Hank Holbrook, Dunkirk, MD) *Way to go!—GVH*

ARGENTINA

Radio Nacional/RAE, 11710 kHz. Full data sheet signed by "Tony & Paul." Station schedule, two additional colorful QSL cards included, and some mint Argentine stamps. Received in 243 days for an English report. Station address: CL 555, 1000 Buenos Aires, Republica Argentina. (LeRoy Long, Edmond, OK)

BRAZIL

Radio Bras, 15445 kHz. Full data station card, signed by Gary Hertha Einctross-Correspondence Services. Received in 61 days for an English report. Station address: Empresa Brasileira de Comunicacao SA, Radio Nacional do Brasil, Caixa Postal 08840 Brasilia DF, Brasil. (Edmund Savage, Mountain Home, AR)

CZECH REPUBLIC

Radio Prague, 7345 kHz. Full data QSL, with illegible veri signer. Received in 29 days for an English report and one IRC. Station address: 120 99 Prague 2, Czech Republic. (Doug Merkel, St. Louis, MO)

GREECE

Voice of Greece, 15650 kHz. Full data oversized color card, of the Acropolis, veriifed. Received in 181 days for an English report. Station address: ERT S.A., Director of Engineering, P.O. Box 60019, 153 10 Aghia Paraskevi Attikis, Athens, Greece. (Long, OK)

KUWAIT

Radio Kuwait, 13620 kHz. Full data QSL card, verified. Program schedule, and "History of Radio Kuwait" fact sheet. Received in 60 days for an English report, and souvenir postcard. Station address: External Services, P.O. Box 397, 13004 Safat, Kuwait. (Savage, AR; Frank Hillton, Charleston, SC)

PAPUA NEW GUINEA

Admiralty Islands, Radio Manus, 3315 kHz. Full data letter from Provincial Programme Manager. Received in two months for an English report. Station address: P.O. Box 505, Lorengau, Manus, Papua New Guinea. (Dr. Adrian M. Peterson, Indianapolis, IN)

PIRATE RADIO

"WLIS" (We Love Interval Signals) 7460, 7413, 7414 kHz. Three separate QSL sheets received in 26 days, for a pirate report and three U.S. mint stamps for each report. Station mail drop via: P.O. Box 109, Blue Ridge Summit, PA 17214. (Harold Frodge, Midland, MI)

Voice of Laryngitis, 7406 kHz. Full data "Sexy Stan" card, signed by Stan Huxley. Personal received, too. Received in 29 days for three U.S. mint stamps. Station mail drop via: P.O. Box 452, Wellsville, NY 14895. (Frodge, MI)

QATAR

Qatar Broadcasting Service, 9715 kHz. Full data map card, verified by Jassim Mohmed Al-Qattan-Head of Public Relations, Exchange & Research. Station booklet and cover letter included. Received in 255 days for an Arabic report, one U.S. dollar, and address label (not used). Station address: Ministry of Information & Culture, Broadcasting Dept., P.O. Box 1414, Doha, Qatar. (Station booklet noted both P.O. Box 1414 and 3939 are in use. I reported to P.O. Box 3939, and received reply from P.O. Box 1414. Mike Hardester, Jacksonville, NC)

RUSSIA

Radio Moscow Int'l, 7810 kHz. Full data QSL card and station sticker. Received in 81 days for an English report and mint stamps. Station address: TV & Radio Agency "Astra," ul. Pyatnitskaya 25, 113326 Moscow, Russia. (Merkel, MO)

SHIP TRAFFIC

AFRICAN CAMELLIA, ELAG5-8234 kHz (Bulk Carrier). Full data prepared QSL card, with ship's stamp and personal letter from Crispin Mangapis, Jr. Received in 60 days for an English utility report, one U.S. dollar, one IRC (returned) and a self-addressed-envelope. Ship address: c/o Seaboard Ship Management, Inc., Suite 210, 440 Sawgrass Corporate Pkwy., Miami, FL 33325. (Russ Hill, Oak Park, MI)

BARBOSI, ELPF6-5696 kHz (Bulk Carrier). Full data prepared QSL card, with ship's stamp and verification letter from Iosif M.-Radio Dept. received in 19 days for an English utility report, one U.S. dollar, one IRC, and a self-addressed-envelope. Ship address: c/o Petromin, Incinta Port, 8700 Constanza, Romania. (Hill, MI)

HMNZS MONOWAI-ZMFI-8213 kHz (Royal New Zealand Naval Survey Vessel). Full data prepared QSL card stamped with the ship's logo. Received in 60 days for an English utility report and one U.S. dollar. Ship address: via Dept. of Defence, Box 5347, Wellington, New Zealand (or via MCO, GPO Auckland, New Zealand) (Rick Albright, Merced, CA)

M/S COLUMBUS CALIFORNIA-DHCM-16528 kHz (German Container Ship). Full data prepared QSL card stamped with ship's seal and company seal. Received in 30 days for a German utility report and two U.S. dollars (German overseas postage is extremely expensive). Ship address: Hamburg-Suedamerikanische Dampfschiffahrtsges., Eggert & Amsinck, Ost-West Str. 59, Postfach 11 15 40, 2000 Hamburg 11, Germany. (Albright, CA)

SUDAN

National Radio Corp., 7200 kHz. Printed full data QSL sheet signed by Elmahdi Khalil. Received in 83 days for an English report, one U.S. dollar, and a Texas trinket. Personal note by Mohd. Elmahdi Khalil, to address all mail to him at Sudan National Radio Corp., P.O. Box 572, Omdurman, Sudan. (Gigi Lytle, Lubbock, TX)

UNITED STATES

WRNO-New Orleans, 15420 kHz. Full data "Louisiana-a Dream State" card, without signature. Received in 74 days for an English report. Station address: Box 100, New Orleans, LA 70181 (or, 4539 I-10 Service Road, Metairie, LA 70006). (Charlie Washburn, North Perry, ME) *Charlie is the easternmost DXer in the U.S.!*

VIETNAM

Radio the Voice of Vietnam, 6115 kHz. New full data printed QSL card, with blanks filled in by hand but no verie signer. Received in 77 days for an English report and old U.S. mint stamps. Also sent contest questions for contest they are sponsoring, station sticker and pennant. Station address: 58 Quan Su Street, Hanoi, Socialist Rep. of Vietnam. (Lytle, TX) *Thanks, Gigi!—GVH*

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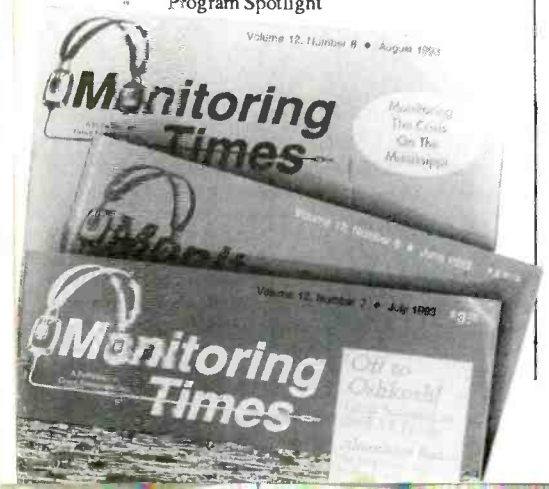
- American Bandscan
- Radio Reflections
- Program Spotlight



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English language

shortwave guide

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 Standard Time) 5, 6, 7, or 8 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 "John Dunn Show" (0030 UTC Sunday) will be heard on Saturday evening (7:30 PM Eastern, 4:30 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—space does not permit 24-hour listings except for the "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

Cut to the Quick

Radio Free Europe/Radio Liberty's existence has been spared from the chopping block, but in greatly reduced form. The Hungarian and Afghan services are already gone; Polish and Czech broadcasts will be reduced to a maximum of fifteen staff members each, probably to be relocated to Warsaw and Prague by the end of the year. The overall staff of RFE/RL is to be reduced from 1530 to 705 staff members by September 1995. The annual budget is to be cut by two-thirds.

The engineering and technical assets are to be consolidated with that of the VOA with probable closure of some transmitting sites. Out-going director Gene Pell said in his address to the RFE/RL staff, "The people who founded these radios were motivated by a belief that the truth would indeed set men and women free one day. They understood the power of information and ideas, and their understanding has been confirmed."

Dan Mica, Chairman of the Board for International Broadcasting, said in his remarks, "Cut we must. Our aim, however, is to keep the broadcasts going to places where they are desperately needed—to go to as many of these places as we can and for as many hours as we can." A new service in Serbo-Croatian to former Yugoslavia is to begin shortly.

All Somalia is Talking

Broadcasting is alive and well in Somalia, reports Glenn Hauser. Recordings indicate R. Hargeisa, V. of the Republic of Somaliland, continues to broadcast, announced 7120 at 1000-1230, 1500 until probably 1700. Believed from a 1-kW mobile transmitter, frequency may vary slightly. Somali: *"Halkani wa Radio Hargeisa, Codka Jamhuriyada Somaliland."*

Radio Awdal, controlled by Gadabursi clan, from Boorama, 60 miles NW of Hargeisa in self-proclaimed Republic of Somaliland, 1630-1700 on 6500, unconfirmed.

R. Mogadishu, V. of the Somali Republic (Somali: *"Radio Mogadishu, Codka Kamhuryada Somalida"*), supporting interim president Ali Mahdi Muhammad, uses one transmitter, USB plus carrier varying 6720-6890 such as 6722; programs may change during Ramadan.

At 0400-0500 (Fri. 0600), 1000-1130, 1600-1800 (BBCM) R. Free Somalia, 7499, read long communiqué in English until 1732* (Mike Barraclough, England, WDXC *Contact*) IARN reported this plans increase from 100 to 1200 watts (John Norfolk, OK)

R. Ibis, Italian army station in Mogadishu, is quite popular with Somalis who speak Italian. Rival warlords say how much they love it, except during 45-minute American-controlled program. Has Italian music, missing persons feature. Symbol is singing banana emerging from map of Somalia (*The Economist*, via SPEEDX) No time or frequency details, may not be SW.

TWR on the Increase

Trans World Radio has added eight new languages to make a total of 100 languages broadcast over their network of nine primary transmitting stations. The new languages are primarily to reach areas inaccessible to missionaries. In addition, new audiences in Britain, Eastern Europe, and the Himalayas are being reached from Radio Tirana and Radio Moscow transmitters.

At a meeting this fall of international broadcasters held by TWR, A. Steven Evans, communication specialist for the Baptist Mission in Mozambique, said, "Radio works. It responds to the needs of the people. It works in Africa, and it works in Mozambique. In times of war, radio can go where missionaries and pastors cannot go."

BBC Facelift Goes Deeper

Renovations at the BBC have reached down into the basement of Broadcasting House which houses the larger studios. The studios are being completely rebuilt using a new design developed by the BBC's research team. Rather than the traditional totally sound-absorbent room, the majority of wall surfaces are reflective, but angled so as to control the acoustic reflections.

"This has given us a better stereo image,...and makes the room less dead and oppressive to work in," says project manager Nick Jennings.

Monitor Radio

The World Service of the Christian Science Monitor has changed its name and its format. Now Monitor Radio International, the new weekday program schedule begins each day with *Monitor Radio Early Edition* at 1000 UTC. If we read the press release correctly, four hourly programs then roll over for 24 hours each Monday at 1400 UTC. Weekend programming is called the Christian Science Sentinel and differs in both content and target areas.

English language **shortwave guide**

MT Monitoring Team

Gayle Van Horn, Frequency Manager
North Carolina

January Deadline: Nov. 24

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
(7:00 PM EST, 4:00 PM PST)
BBC
China Radio Int+l
Czech Republic
FEBC (Philippines)
Monitor Radio Int+l [T-F]
Radio Australia
Radio Canada Int+l [S-M]
Radio Havana Cuba
Radio Moscow
Radio New Zealand Int+l [M-A]
Radio Norway Int+l [M]
Radio Thailand
Radio Vilnius [A]*
Radio Vilnius [T-F]
Radio Vlaanderen Int+l
Spanish National Radio
Voice of America (am/as/ca)
WWCR (15610)
0003
Radio Pyongyang
0005
Radio Vilnius [A]*
0008
China Radio Int+l*
0010
Voice of America (ca) [T-A]*
0030
HCJB
Radio Havana Cuba
Radio Moscow
Radio Nacional de Venezuela [T-S]
Radio Netherlands Int+l
Radio Sweden [T-A]
Voice of America (am/as) (Special English)
Voice of America (ca) [S-M] (Special English)
0045
Korean World News Service
0057
Spanish National Radio [F]

0100 UTC
(8:00 PM EST, 5:00 PM PST)
All India Radio
BBC
Czech Republic
Deutsche Welle
Monitor Radio Int+l [T-F]
R Slovakia Int+l
Radio Australia
Radio Havana Cuba
Radio Japan
Radio Korea
Radio Moscow
Radio New Zealand Int+l [M-A]
Radio Thailand
Radio Ukraine Int+l
Radio Yugoslavia
RAI Italy
Spanish National Radio
Swiss Radio Int+l
Voice of America (am/as/ca)
Voice of Indonesia
WWCR (7435) [T-A]
WWCR (5810) [S]
0103
Radio Bulgaria
0110
Radio Australia [M-F]*
0119
Radio Ukraine Int+l [H]*
0122
Radio Ukraine Int+l [W]*
0123
Radio Sweden [T]
0130
Radio Austria Int+l
Radio Havana Cuba
Radio Moscow
Radio Netherlands Int+l
Radio Sweden [T-A]
Radio Tirana
Voice of Greece [M-A]
0145
BBC (ca) [T-A]*
0155
Voice of Indonesia
0157
Spanish National Radio [F]

0200 UTC
(9:00 PM EST, 6:00 PM PST)
BBC
Christian Science Sentinel [A]
Deutsche Welle
KVOH [T-A]
Monitor Radio Int+l [T-F]
Radio Australia
Radio Canada Int+l
Radio Havana Cuba
Radio Moscow
Radio New Zealand Int+l [M-A]
Radio Norway Int+l [M]
Radio Romania Int+l [T-S]
Radio Thailand
Radio Yugoslavia
Voice of America (am) [T-A]
Voice of America (as)
Voice of Myanmar (Burma)
WHRI (7315) [M]
WWCR (5810) [T-S]
0201
Radio Romania Int+l [M]
0203
Voice of Free China
0215
Radio Cairo
Radio Nepal
0230
HCJB [M]
Radio Havana Cuba
Radio Moscow [T-A]
Radio Netherlands Int+l
Radio Pakistan
Radio Portugal Int+l [T-A]
Radio Sweden [T-A]
Radio Tirana
0245
Korean World News Service

0300 UTC
(10:00 PM EST, 7:00 PM PST)
BBC
China Radio Int+l
Christian Science Sentinel [A]
Czech Republic
Deutsche Welle
HCJB [T-S]
KVOH [T-A]
Monitor Radio Int+l [T-F]
Radio Australia
Radio Budapest Int+l
Radio Canada Int+l
Radio Havana Cuba
Radio Japan
Radio Moscow
Radio New Zealand Int+l [M-A]
Radio Norway Int+l [M]
Radio Thailand
Vatican Radio [F]
Voice of America (af)
WHRI (7315) [T-A]
WWCR (5810) [T-A]
WWCR (7435) [S]
0303
Voice of Free China
0308
China Radio Int+l*
0309
BBC*
0315
Radio Cairo
0320
Radio Philipinas [M-A]
0330
BBC (af)*
Radio Austria Int+l
Radio Dubai
Radio Havana Cuba
Radio Moscow
Radio Nacional de Venezuela [T-S]
Radio Netherlands Int+l
Radio Sweden [T-A]
0340
Voice of Greece [M-A]
0345
Radio Yerevan
0355
Radio Japan [M-W]

0400 UTC
(11:00 PM EST, 8:00 PM PST)
BBC
BBC (af)
Channel Africa
China Radio Int+l
Christian Science Sentinel [A]
Czech Republic
Deutsche Welle
Monitor Radio Int+l [T-F]
Radio Australia
Radio Canada Int+l
Radio Havana Cuba
Radio Moscow
Radio Moscow (na)
Radio New Zealand Int+l [M-F]
Radio Romania Int+l
Radio Thailand
Swiss Radio Int+l
Voice of America (af/eu)
Voice of Turkey
WHRI (7315) [T-A]
WWCR (5810) [M-A]
0403
Radio Pyongyang
0408
China Radio Int+l*
0411
Channel Africa [T]
0415
RAI Italy
0430
Channel Africa [A]
Radio Havana Cuba
Radio Moscow (na)
0431
Channel Africa [T/H/F]
0445
BBC (af) [T-F]*

0500 UTC
(12:00 AM EST, 9:00 PM PST)
BBC
BBC (af) [M-F]
Channel Africa
Christian Science Sentinel [A]
Deutsche Welle
HCJB
Israel Radio Int+l
Monitor Radio Int+l [T-F]
Radio Australia
Radio Havana Cuba
Radio Japan
Radio Moscow
Radio Moscow (na)
Radio New Zealand Int+l [A-S]
Radio New Zealand Int+l [M-F]*
Radio Thailand
Spanish National Radio
Swiss Radio Int+l (eu)
Vatican Radio [A]
Voice of America (af/eu)
0501
Channel Africa [A-S]
0503
Radio Bulgaria
0510
Radio Australia [M-F]*
0530
Channel Africa [F-M/W]
Radio Austria Int+l
Radio Finland [M-A]
Radio Moscow
Radio Moscow (na)
Radio Thailand
Voice of Nigeria
0531
Channel Africa [T]
0540
Voice of Nigeria*
0548
Channel Africa [A]
0550
Radio Finland [S]
0557
Spanish National Radio [F]

0600 UTC
(1:00 AM EST, 10:00 PM PST)
BBC
BBC (af) [A-S]*
BBC (af) [M-F]
Channel Africa
Deutsche Welle
Monitor Radio Int+l [T-F]
Radio Australia
Radio Canada Int+l [M-F]
Radio Havana Cuba
Radio Korea
Radio Moscow
Radio Moscow (na)
Radio New Zealand Int+l [M-F]*
Swiss Radio Int+l

newsline

Swiss Radio Int+l (eu)
Voice of America (af/eu)
Voice of Kenya
Voice of Malaysia
WWCR (7435) [F]
0603
Radio Pyongyang
0609
BBC*
0627
BBC (af) [M-F]*
0630
Channel Africa [W]
Radio Austria Int+l [T-S]
Radio Havana Cuba
Radio Moscow
Radio Moscow (na) [H-T]
Vatican Radio [H]
0631
Radio Moscow (na) [W]
0632
Radio Romania Int+l
0640
Vatican Radio [T]
0642
Voice of Nigeria [A]*
0645
Radio Romania Int+l
Voice of Nigeria [S-F]*
0650
Radio New Zealand Int+l [M-F]*
Voice of Med. (Malta)
0653
Channel Africa [S]

0700 UTC
(2:00 AM EST, 11:00 PM PST)
BBC
BBC (af) [M-F]
Monitor Radio Int+l [T-F]
Radio Australia
Radio Ghana
Radio Japan
Radio Moscow
Radio Moscow (na)
Radio New Zealand Int+l [M-F]*
Radio New Zealand Int+l [S]
Swiss Radio Int+l (eu)
Voice of Myanmar (Burma)
WWCR (7435) [S]
0703
Radio Pyongyang
Voice of Free China
0710
Radio Australia [W]*
0730
BBC (af) [A]*
HCJB
Radio Moscow
Radio Moscow (na) [H-T]
Radio Netherlands Int+l
Radio Vlaanderen Int+l
Vatican Radio [M-A]
0731
Radio Moscow (na) [W]
0745
Radio Finland [M-A]
0755
Radio Japan [M-F]

0800 UTC
(3:00 AM EST, 12:00 AM PST)
BBC
Christian Science Sentinel [M]
Monitor Radio Int+l [T-F]
Radio Australia
Radio Korea
Radio Moscow
Radio New Zealand Int+l [M-F]*
Radio New Zealand Int+l [S]
Radio Norway Int+l [S]
Voice of Indonesia [A-H]
Voice of Malaysia
WWCR (7435) [A]
0803
Radio Pyongyang
0830
R Slovakia Int+l
Radio Austria Int+l
Radio Moscow [M-A]
Radio Netherlands Int+l
0855
Voice of Indonesia [A-H]

0900 UTC
(4:00 AM EST, 1:00 AM PST)
BBC
China Radio Int+l
Christian Science Sentinel [M]
Deutsche Welle
Monitor Radio Int+l [M-F]
Radio Australia
Radio Finland [M-A]
Radio Japan
Radio Moscow
Radio New Zealand Int+l [S-M]
Swiss Radio Int+l
0908
China Radio Int+l*
0915
Korean World News Service
0930
FEBC (Philippines)
Radio Moscow
Radio Netherlands Int+l
Radio New Zealand Int+l [T]
0933
Radio New Zealand Int+l [M]
0940
Voice of Greece
0945
Deutsche Welle [M-F]*
Radio Yerevan [S]
0955
Radio Japan [M-W]

1000 UTC
(5:00 AM EST, 2:00 AM PST)
BBC
China Radio Int+l
Christian Science Sentinel [A]
FEBC (Philippines) [M-F]*
HCJB
Monitor Radio Int+l [M-F]
Radio Australia
Radio Moscow
Radio New Zealand Int+l [M-F]*
Radio New Zealand Int+l [S]
Radio Norway Int+l [S]
Radio Vlaanderen Int+l [T-A]
Voice of America (as/ca)
Voice of Kenya
1005
Radio New Zealand Int+l [M-F]*
1008
China Radio Int+l*
1030
Radio Austria Int+l [M-A]
Radio Dubai
Radio Korea
Radio Moscow
Radio Netherlands Int+l
Radio New Zealand Int+l [M-F]*
Voice of Nigeria [M-F]
1040
Voice of Greece

1100 UTC
(6:00 AM EST, 3:00 AM PST)
BBC
Channel Africa
Christian Science Sentinel [A]
Deutsche Welle
Israel Radio Int+l
Monitor Radio Int+l [M-F]
Radio Australia
Radio Ghana [A-S]
Radio Japan
Radio Moscow
Radio New Zealand Int+l
Radio Pakistan
Swiss Radio Int+l
Swiss Radio Int+l (eu)
Vatican Radio [M-A]
Voice of America (as/ca)
1103
Radio Pyongyang
1110
Radio Australia*
1115
Korean World News Service
1125
WYFR (Satellite Network) [M-A]
1130
Czech Republic
Radio Moscow
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int+l
Voice of Asia
1133
Radio Bulgaria
1135
Radio Thailand
1145
Deutsche Welle [S-F]*

1200 UTC
(7:00 AM EST, 4:00 AM PST)
BBC
China Radio Int+l
Christian Science Sentinel [A]
Monitor Radio Int+l [M-F]
Radio Australia
Radio Jordan
Radio Moscow
Radio New Zealand Int+l
Radio Norway Int+l [S]
Radio Tashkent
Radio Thailand
Voice of America (as)
WWCR (15685) [M-F]
WYFR (Satellite Network) [M-A]
1203
HCJB [M-F]
Radio Korea
1208
China Radio Int+l*
1209
BBC [W]*
1224
HCJB [M-F]
1230
Radio Austria Int+l
Radio Bangladesh [S-M]
Radio Cairo
Radio Canada Int+l
Radio Finland [M-A]
Radio France Int+l
Radio Moscow
Radio Netherlands Int+l
Radio Sweden [W-F/T]
Voice of Vietnam [T/F]
WYFR (Satellite Network) [M-A]
1253
Radio France Int+l [M-W/F]
1254
Radio France Int+l [A]
1255
Radio France Int+l [H]

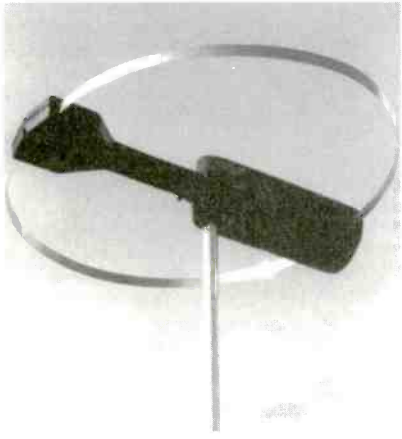
1300 UTC
(8:00 AM EST, 5:00 AM PST)
BBC
China Radio Int+l
Christian Science Sentinel [A]
KNLS
Monitor Radio Int+l [M-F]
Radio Australia
Radio Canada Int+l
Radio Ghana
Radio Moscow
Radio Romania Int+l
Swiss Radio Int+l
Voice of America (as)
Voice of Kenya
WYFR (Satellite Network) [M-A]
1302
Radio Korea
1303
Radio Pyongyang
1308
China Radio Int+l*
1310
Radiobras [M-F]
1315
Radio Nepal
1324
HCJB [M-F]
1328
Radio Cairo
1330
All India Radio
FEBC (Philippines)
Korean World News Service
Radio Austria Int+l
Radio Canada Int+l [A-S]
Radio Dubai
Radio Finland [M-A]
Radio Moscow [M-A]
Radio Netherlands Int+l
Radio Sweden [M-F]
Radio Tashkent
Radio Vlaanderen Int+l [S]
Radio Yugoslavia
Voice of America (as) (Special English)
Voice of Turkey
Voice of Vietnam
1333
Radio Bulgaria

1400 UTC
(9:00 AM EST, 6:00 AM PST)
All India Radio [M/W/F]
BBC
China Radio Int+l
Christian Science Sentinel [A]
Israel Radio Int+l [S-H]
Monitor Radio Int+l [M-F]
Radio Australia
Radio Canada Int+l [S-F]
Radio Finland [S]
Radio France Int+l
Radio Ghana
Radio Japan
Radio Moscow
Radio Vlaanderen Int+l [M-A]
Voice of America (as)
WHRI (15105) [M-F]
WHRI (9465) [M-F]
1403
Radio Korea
1408
China Radio Int+l*
1420
Israel Radio Int+l [H]*
1422
Israel Radio Int+l [S]
1424
HCJB [M-F]
Israel Radio Int+l [T/W/H]
1430
FEBC (Philippines)
Radio Canada Int+l [S]
Radio Finland [M-A]
Radio Moscow
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int+l
Radio Romania Int+l
Radio Sweden [M-F]
RTM Morocco [S]
Voice of Myanmar (Burma)
WYFR (Satellite Network) [M-A]
1435
Voice of Greece
1440
FEBC (Philippines) [S-F]*
1445
BBC (as) [M-F] (Special English)
Voice of Myanmar (Burma)
1450
All India Radio
Voice of Med. (Malta)
1453
Radio France Int+l [T/A]
1455
All India Radio

1500 UTC
(10:00 AM EST, 7:00 AM PST)
BBC
BBC (af) [M-F]
Channel Africa
China Radio Int+l
Christian Science Sentinel [A]
Deutsche Welle
Monitor Radio Int+l [M-F]
Radio Australia
Radio Canada Int+l [S]
Radio Japan
Radio Moscow
Radio Omdurman
Swiss Radio Int+l
Voice of America (as/eu)
WHRI [A]
1503
Radio Pyongyang
1508
China Radio Int+l*

STEP UP YOUR SHORTWAVE SET UP.

ISOLOOP 10-30 HF PORTABLE ANTENNA.
This is the one that gives you freedom of speech, whether you have to deal with restrictive covenants at home or in your apartment or condo, or if you are traveling in your boat, car, or RV. It features 150 watts, continuous coverage from 10 to 30 MHz, narrow bandwidth to suppress out-of-band signals. The IsoLoop antenna comes fully assembled with no mechanical joints. There is simply no better value in antennas!



PK-232MBX DIGITAL MULTI-MODE CONTROLLER.
It can receive eight different types of data signals, including Morse code, Baudot, ASCII, Time Division Multiplex (TDM), WEFAX, NAVTEX, Packet and AMTOR. Also featured is SIAM which automatically identifies many types of digital signals, excellent software support for PC compatibles, Macintosh and Commodore 64 & 128 computers. This unit is essential for the serious digital listener.

AEA-FAX.
Here's the superior way to decode multi-level gray fax images received by your general coverage receiver. Featured is AEA's exclusive on-screen tuning scope that allows you to simultaneously tune and receive. There is also Autolist for unattended image capture and save-to-disk, "daisy-chain" external RS-232 input allowing AEA-FAX to share a COM port with PK-232 MBX, up to 16 gray levels (VGA), support for EGA, CGA and Hercules formats. AEA-FAX prints to HP LaserJet or Epson compatible printers and includes hardware demodulator, 3 1/2" and 5 1/4" software disks plus a comprehensive instruction manual. AEA-FAX is a must for your set-up!

To connect with the AEA dealer nearest you or for product sheets, call (800) 432-8873.

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PO Box C2160, 2006 - 196th St. SW, Lynnwood, WA 98036 Sales: (206) 774-5554

Connect with us

newsline

1525
BBC (af) [S]*
Radio Veritas [T-F]
1529
Deutsche Welle [F]*
1530
Deutsche Welle [M-H]*
FEBC (Philippines)
Radio Austria Int+l
Radio Moscow
Radio Netherlands Int+l
Radio Portugal Int+l [M-F]
Radio Tirana
Voice of Greece [M-A]
1540
Radio Veritas [A-M]
1545
Korean World News Service
1555
Radio Japan [M-W]
Radio Veritas [A-M]

1600 UTC
(11:00 AM EST, 8:00 AM PST)
BBC
Channel Africa
China Radio Int+l
Christian Science Sentinel [A]
Czech Republic
Deutsche Welle
Monitor Radio Int+l [M-F]
Radio Australia
Radio Canada Int+l [S]
Radio France Int+l
Radio Korea
Radio Moscow
Radio Pakistan
Radio Tanzania
Voice of America (af/as/eu)
Voice of Kenya
WHRI (13760) [A]
WWCR (15685) [M-F]
WWCR (15610) [A]
1608
China Radio Int+l*
1609
BBC*
1630
HCJB [S-F]
Radio Austria Int+l
Radio Canada Int+l
Radio Dubai
Radio Finland [M-F]
Radio Moscow
Voice of America (as/eu) (Special English)
1650
WYFR (Satellite Network) [M-A]
1652
Radio France Int+l [M-F]

1700 UTC
(12:00 PM EST, 9:00 AM PST)
BBC
BBC (af)
Channel Africa
China Radio Int+l
Monitor Radio Int+l [M-F]
Radio Australia
Radio Japan
Radio Moscow
Radio New Zealand Int+l [M-F]*
Radio Pakistan
RTM Morocco [A]
Swiss Radio Int+l
Voice of America (af/as/eu)
1703
Radio Pyongyang
1708
China Radio Int+l*
1710
Radio Australia*
1715
Korean World News Service
Radio Sweden [M-F]
1725
Radio New Zealand Int+l [M-F]*
1730
Radio Moscow [S-F]
Radio Netherlands Int+l
Radio Romania Int+l
Vatican Radio [F]
Voice of America (af) [A-S]
1740
BBC (af)*
1745
All India Radio

1800 UTC
(1:00 PM EST, 10:00 AM PST)
All India Radio
BBC
Christian Science Sentinel [A]
Israel Radio Int+l
Monitor Radio Int+l [M-F]
Polish Radio
Radio Australia
Radio Moscow
Radio New Zealand Int+l [M-F]*
Radio Norway Int+l [S]
Radio Tanzania
Voice of America (af/eu)
Voice of Kenya
WHRI (9590) [M-F]
WWCR (15610) [M-F]
WWCR (15685) [M-F]
1805
Radio New Zealand Int+l [M-F]*
1830
Radio Kuwait [M/H/A]
Radio Moscow
Radio Nacional de Venezuela [M-A]
Radio Netherlands Int+l
Radio Sweden [M-F]
Voice of America (af) [A-S] (Special English)
Voice of America (eu) (Special English)
1833
Radio Bulgaria
1835
Radio New Zealand Int+l [F]*
1840
Voice of Greece [M-A]
1855
Radio New Zealand Int+l [M-H]*
1857
BBC (af) [M-F]*

1900 UTC
(2:00 PM EST, 11:00 AM PST)
All India Radio [W]
BBC
BBC (af) [M-F]
China Radio Int+l
Christian Science Sentinel [A]
Deutsche Welle
HCJB
Monitor Radio Int+l [M-F]
Radio Australia
Radio Japan
Radio Moscow
Radio New Zealand Int+l [S-F]
Radio Portugal Int+l [M-F]
Radio Romania Int+l
Radio Vlaanderen Int+l
Spanish National Radio
Voice of America (af) [S-F]
Voice of America (as/eu)
WHRI (9590) [M-F]
WWCR (15610) [M-F]
1903
Radio Bulgaria [M/H]
1908
China Radio Int+l*
1910
All India Radio [W]
Radio Australia [M-F]*
1930
BBC (af) [S]*
Deutsche Welle [T-F]*
R Slovakia Int+l
Radio Austria Int+l
Radio Finland [S-F]
Radio Moscow
Radio Netherlands Int+l
Radio Yugoslavia
Voice of America (af) [S]
1933
Deutsche Welle [M]*
1935
RAI Italy
1945
Radio Yerevan
1955
Radio Japan [M-W]

2000 UTC
(3:00 PM EST, 12:00 PM PST)
BBC
China Radio Int+l
Israel Radio Int+l
KVOH [A-S]
Monitor Radio Int+l [M-F]
Radio Australia
Radio For Peace Int+l [A]
Radio Moscow
Radio New Zealand Int+l [S-F]
Radio Norway Int+l [S]
Radio Portugal Int+l [M-F]
Radio Riga Int+l [A-S]
Swiss Radio Int+l
Swiss Radio Int+l (eu)
Voice of America (af/eu)
Voice of Greece [M-A]
Voice of Indonesia
WWCR (15610) [M-A]
2003
Radio Pyongyang
2008
China Radio Int+l*
2010
Radio New Zealand Int+l [S-H]*
2011
Israel Radio Int+l [W]*
2024
Israel Radio Int+l [T]
2025
RAI Italy
2028
Israel Radio Int+l [M]
2030
HCJB [M-A]
Polish Radio
Radio Korea
Radio Moscow [A-S]
2031
HCJB [S]
2045
All India Radio [A]
Korean World News Service
2055
Voice of Indonesia [M]

2100 UTC
(4:00 PM EST, 1:00 PM PST)
All India Radio
BBC
China Radio Int+l
Deutsche Welle
KVOH [S]
Monitor Radio Int+l [M-F]
Radio Australia
Radio Damascus [F]
Radio Havana Cuba
Radio Japan
Radio Moscow
Radio New Zealand Int+l [S-H]
Radio Romania Int+l
Radio Ukraine Int+l
Spanish National Radio
Voice of America (af/as/eu)
Voice of Turkey
WWCR (15610) [M-A]
2103
Radio Bulgaria
2108
China Radio Int+l*
2110
Radio Damascus [S-M]
Radio New Zealand Int+l [S-F]*
2112
Radio Damascus [F]
2115
BBC (ca) [M-F]*
2120
Radio Cairo
2130
Radio Cairo [M]
Radio Canada Int+l
Radio Moscow
Radio Nacional de Venezuela [M-A]
Radio Riga Int+l [M-F]
Radio Sweden [M-F]
WWCR (15610) [M-F]
2131
Radio Havana Cuba
2145
Radio Damascus [W]
Radio Korea

2200 UTC
(5:00 PM EST, 2:00 PM PST)
All India Radio [F-W]
BBC
China Radio Int+l
Christian Science Sentinel [A]
Czech Republic
Monitor Radio Int+l [M-F]
Radio Australia
Radio Budapest Int+l
Radio Canada Int+l
Radio Havana Cuba
Radio Korea
Radio Moscow
Radio New Zealand Int+l
Radio Vlaanderen Int+l [M-F]
Radio Yugoslavia
RAI Italy
Voice of America (as)
WWCR (15610) [M-F]
2203
Voice of Free China
2208
China Radio Int+l*
2209
BBC*
2215
All India Radio [M/F]
Radio Cairo
2230
Israel Radio Int+l
Radio Finland [S-F]
Radio Havana Cuba
Radio Moscow [S-F]
Radio Sweden [M-F]
Voice of America (as) (Special English)
2240
Radio Cairo
Voice of Greece [S-F]
2242
Israel Radio Int+l [H]*
2245
Radio Yerevan
2248
Radio Bulgaria
2253
Israel Radio Int+l [T]
2257
Israel Radio Int+l [M]

2300 UTC
(6:00 PM EST, 3:00 PM PST)
BBC
Christian Science Sentinel [A]
Monitor Radio Int+l [M-F]
Radio Australia
Radio Canada Int+l
Radio Japan
Radio Moscow [F-W]
Radio New Zealand Int+l
Radio Norway Int+l [S]
Radio Tirana
Voice of America (as)
Voice of Turkey
WWCR (15610) [M-A]
2303
Radio Pyongyang
2330
Radio Austria Int+l
Radio Moscow
Radio Netherlands Int+l
Radio New Zealand Int+l [M]*
Radio New Zealand Int+l [S-H]
Radio Sweden [M-F]
SLBC (Sri Lanka) [M]
2335
Voice of Greece [S-F]
2340
Radio Yerevan
2355
Radio Japan [M-W]

English language

shortwave guide

0000 UTC [7:00 PM EST/4:00 PM PST]

FREQUENCIES

0000-0100	Australia, ABC Brisbane	4920do	9660do		
0000-0100	Australia, ABC Perth	9610do			
0000-0100	Australia, Radio	13605as	15320pa	15365pa	15510as
		17750as			
0000-0100 vl	Australia, VL8A Alice Spg	4835do			
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T Tent Crk	4910do			
0000-0015	Bulgaria, Radio	7455eu	9700na		
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	Canada, RCI Montreal	5960na	9755na		
0000-0100	China, China Radio Intl	9780na	11715na		
0000-0100	Costa Rica, AWR Alajuela	9725ca	11870ca		
0000-0100	Cuba, Radio Havana Cuba	6010na	9815na		
0000-0030	Czech Republic, R Prague	5915na	5930na	7345na	9405na
		9810na			
0000-0045	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
0000-0100 irreg	Iraq, Radio Iraq Intl	15180am	17940am		
0000-0100	Lebanon, King of Hope	6280me			
0000-0100 mtwhf	Lebanon, Wings of Hope	11530me			
0000-0030 twhfs	Lithuania, Radio Vilnius	7150am			
0000-0100 vl	Malaysia, RTM Kota Kinaba	5980do			
0000-0100 vl	Malaysia, RTM Sarawak	4950do	7160do		
0000-0025	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	11925sa		
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	7165am	7205am	7335am	9620am
		9750am	9860na	11685am	11790am
		11960as	11970as	12015me	12050me
		13775as	15375am	15425am	15470am
		17570as	17590as	17610as	17665na
		17720na	17860as	17890as	21480na
		21625na	21690na		
0000-0100	Singapore, SBC Radio One	5010do	5052do	11940do	
0000-0100	Spain, Spanish Natl Radio	9540na			
0000-0100	Thailand, Radio	4830as	9655as	11905as	
0000-0100	United Kingdom, BBC London	5975na	6175na	7180eu	7325na
		9590na	9915na	11750sa	15260sa
0000-0100	USA, KCBI Dallas TX	13740na			
0000-0100	USA, KTBN Salt Lk City UT	15590am			
0000-0100	USA, KVOH Los Angeles CA	17775am			
0000-0100	USA, Monitor Radio Intl	5850na	9430ca	13760sa	
0000-0100	USA, VOA Washington DC	5995sa	6130sa	7215as	7405sa
		9455ca	9770as	9775ca	11580sa
		11695sa	11760as	15120sa	15185as
		15205sa	15250as	15290as	17735as
		17820as			
0000-0100	USA, WEWN Birmingham AL	7425am			
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	5810am	7435am	13845am	
0000-0100	USA, WYFR Okeechobee FL	6085na			
0010-0015	Kirghizia, Kirghiz Radio	6080as			
0030-0100	Australia, Radio	11720pa	11800pa	15240as	17715pa
		17795pa	17880as	21740pa	
0030-0055	Belgium, R Vlaanderen Int	7370na	9930na		
0030-0100	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0030-0100	Iran, VOIRI Tehran	9022am	11790am	15260am	
0030-0100	Netherlands, Radio	6020na	6165na	7305as	9840na
		9860as	11655na		
0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0030-0100	Sweden, Radio	9695am	11650am		

SELECTED PROGRAMS

Sundays

0000 Radio Netherlands (na): Bats; Balls & Baselines. NEW! Sports results, news, issues, features, personality profiles, and investigations.
0011 Radio Moscow: News and Views. Russian views on news developments.
0025 Radio Netherlands (na): EuroPress Review. Five-minutes of EuroPress news.
0037 Radio Netherlands (na): Newsline. Correspondent reports, interviews, and commentaries on current events.
0053 Radio Netherlands (na): Sounds Interesting. Listener feed back and the signts and sounds of Holland.

Mondays

0000 Christian Science Sentinel: Sunday from The Mother Church. See S 2300.
0000 Radio Netherlands (na): East of Edam. See S 2337.
0011 Radio Moscow: News and Views. See S 0011.
0025 Radio Netherlands (na): Music Break. Five-minutes of music at the end of an hour's program.
0032 Radio Moscow: Folk Box. One of the top ten entertainment programs (Passport to World Band Radio).
0036 Radio Netherlands (na): Happy Station. Pete Myers hosts this 65 year old program of family entertainment.

Tuesdays

0000 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0000 Radio Netherlands (na): Let's Get to Business. See M 2352.
0006 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0008 Radio Netherlands (na): CDutch. Dutch concert music.
0011 Radio Moscow: News and Views. See S 0011.
0025 Radio Netherlands (na): Dutch Press Review. Summary of items in the Dutch media.
0032 Radio Moscow: Yours for the Asking. A 30-minute musical request program.
0037 Radio Netherlands (na): Newsline. See S 0037.
0044 Monitor Radio Int'l: Letterbox. See M 2344.
0051 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
0052 Radio Netherlands (na): Research File. A program of science and technology.

Wednesdays

0000 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0000 Radio Netherlands (na): No Boundaries. See T 2353.
0006 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0011 Radio Moscow: News and Views. See S 0011.
0025 Radio Netherlands (na): Dutch Press Review. See T 0025.
0032 Radio Moscow: The Jazz Show. See M 0530.
0037 Radio Netherlands (na): Newsline. See S 0037.
0044 Monitor Radio Int'l: Letterbox. See M 2344.
0051 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
0052 Radio Netherlands (na): Mirror Images. Weekly magazine of arts and culture.

Thursdays

0000 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0000 Radio Netherlands (na): Encore! See W 2352.
0006 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0011 Radio Moscow: News and Views. See S 0011.
0025 Radio Netherlands (na): Dutch Press Review. See T 0025.
0030 BBC: Features. See W 1530.
0032 Radio Moscow: Music at Your Request. See M 1232.
0037 Radio Netherlands (na): Newsline. See S 0037.
0044 Monitor Radio Int'l: Letterbox. See M 2344.
0051 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
0052 Radio Netherlands (na): Documentary. An in-depth treatment of one subject or a short series.
0052 Radio Netherlands (na): "Cutting Edge" (16th,23nd). A two-part documentary looks at police and ambulance services.

Fridays

0000 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0000 Radio Netherlands (na): Research File. See T 0052.
0006 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0011 Radio Moscow: News and Views. See S 0011.
0025 Radio Netherlands (na): Dutch Press Review. See T 0025.
0030 BBC: Music Feature. "Latins in the USA" (3rd,10th,17th,24th). An examination of the music and culture of the Latin communities in America.
0030 BBC: Music Feature. "The Story of Western Music" (31st). NEW! The first program in this new series explores the beginnings of the classic style during the age of Mozart.
0032 Radio Moscow: The Jazz Show. See M 0530.
0037 Radio Netherlands (na): Newsline. See S 0037.
0044 Monitor Radio Int'l: Letterbox. See M 2344.
0051 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Saturdays

0000 Radio Netherlands (na): Documentary. See H 0052.
0011 Radio Moscow: News and Views. See S 0011.
0025 Radio Netherlands (na): Dutch Press Review. See T 0025.
0032 Radio Moscow: Folk Box. See M 0032.
0037 Radio Netherlands (na): Newsline. See S 0037.
0052 Radio Netherlands (na): Towards 2000. A focus on the global aspects of social change.

0100 UTC [8:00 PM EST/5:00 PM PST]

FREQUENCIES

0100-0200	Australia, ABC Brisbane	4920do	9660do		
0100-0200	Australia, ABC Perth	9610do			
0100-0200	Australia, Radio	11720pa	11800pa	15240as	15320pa
		15365pa	15510as	17715pa 1	7750as
		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	Bulgaria, Radio	7455na	9700na		
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
0100-0200	Cuba, Radio Havana Cuba	6010na	9815na		
0100-0130	Czech Republic, R Prague	5915na	7345na	9405na	
0100-0200	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0100-0150	Germany, Deutsche Welle	6040na	6085na	6120na	6145na
		9565na	9700na	9745na	
0100-0200 mwf	Guam, KSDA AWR Agat	15610as			
0100-0200	Indonesia, Voice of	9675na	11752na		
0100-0130	Iran, VOIRI Tehran	9022am	11790am	15260am	
0100-0120	Italy, RAI Rome	6005na	9575na	11800na	
0100-0200	Japan, NHK/Radio	5960na	11860as	15195as	17775as
		17810as	17845as		
0100-0130	Laos, National Radio of	7116as			
0100-0200	Lebanon, King of Hope	6280me			
0100-0200	Namibia, Namibia BC Corp	3290af			
0100-0200	Netherlands, Radio	7305as	9860as		
0100-0125	Netherlands, Radio	6020na	6165na	9840na	11655na
0100-0200	New Zealand, R NZ Intl	15120pa			
0100-0200	Philippines, FEBC Manila	15450as			
0100-0200 vl	PNG, Natl BC	4890do			
0100-0200	Russia, Radio Moscow Intl	5915af	7165af	7180af	7205af
		7335af	9620am	9750am	9860am
		11685as	11960as	11970as	12015as
		12050as	13775am	15375am	15425am
		15475am	17560am	17570na	17590na
		17610as	17655as	17720na	17860na
		17890as	21480na	21690na	
0100-0130	Serbia, Radio Yugoslavia	9580eu	11870na		
0100-0200	Singapore, SBC Radio One	5010do	5052do	11940do	
0100-0127	Slovakia, R Slovakia Intl	5930am	7310am	9810am	
0100-0200	South Korea, Radio Korea	7550eu	15575am		
0100-0200	Spain, Spanish Natl Radio	9540na			
0100-0200	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0100-0130	Switzerland, Swiss R Intl	6135am	9885am	17740am	
0100-0200	Thailand, Radio	4830as	9655as	11905as	
0100-0200	Ukraine, R Ukraine Intl	6070eu	6090eu	7150eu	7195eu
		7240eu	9550eu	9640eu	9860na
		11720na	15195na	17605na	17690na
0100-0200	United Kingdom, BBC London	5975na	6175na	7325na	9590na
		9915sa	11750sa	15260sa	15310as
		17790as			
0100-0200	USA, KCBI Dallas TX	13740na			
0100-0200	USA, KTBN Salt Lk City UT	7510na			
0100-0200	USA, KVOH Los Angeles CA	17775am			
0100-0200	USA, Monitor Radio Intl	5850na	9430sa	13760sa	
0100-0200	USA, VOA Washington DC	5995sa	6130sa	7115as	7205as
		7405sa	9455ca	9775as	11580sa
		11705as	15120sa	15160sa	15205sa
		15250as	17740as	21550sa	
0100-0200	USA, WEWN Birmingham AL	7425as	13710as		
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	5810am	7435am	13845am	
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na	15440na	
0100-0130	Uzbekhistan, R Tashkent	7285as	9715as	15295as	17815as
0130-0200	Albania, R Tirana Intl	9580na	11840na		
0130-0200	Austria, R Austria Intl	9655na	9870sa	13730sa	
0130-0150 mtwhfa	Greece, Voice of	9380na	9420na	11645na	
0130-0200	Netherlands, Radio	9845as	9860as	11655as	
0130-0200	Sweden, Radio	9695au	11695as		
0130-0200	USA, WHRI Noblesville IN	7315am			
0145-0200 smtwhf	Finland, YLE/Radio	11755na	15185na		
0145-0200	Vatican State, Vatican R	5975as	9650as		

SELECTED PROGRAMS

Sundays

0100 Christian Science Sentinel: Bible Lesson from the King James Version and Mary Baker Eddy's textbook.
0101 BBC: Play of the Week. "Dr. Strangelove" (5th,12th). A two-parter of the novel by Peter George.
0101 BBC: Play of the Week. "The Unbearable Bassington" (26th). The macabre story of a young man with all the right attributes except for one fatal flaw.
0101 BBC: Play of the Week. Play of the Week. "Lord Arthur Savile's Crime" (19th). Oscar Wilde's story about a man who plots a murder after a palmist forecasts his crime.
0111 Radio Moscow: Moscow Mailbag. Joe Adamov answers listener questions.
0125 Radio Netherlands: Program Info. Summary of upcoming program schedules.
0129 Christian Science Sentinel: Radio Edition. Discussions on how the Bible addresses the trends of thought of today.
0132 Radio Moscow: Audio Book Club. The best of Russian classic and contemporary literature.
0137 Radio Netherlands: Happy Station. Pete Myers hosts this 65 year old program of family entertainment.

Mondays

0100 Christian Science Sentinel: Sunday from The Mother Church. See S 2300.
0101 BBC: Special Feature. "Christmas Turkeys" (20th). John Walters samples the very worst of Christmas pop music through the decades.
0101 BBC: Special Feature. "Red Emperor" (27th). The 100th anniversary of the birth of China's Chairman Mao is.
0101 BBC: Special Feature. "The Greatest Story Ever Told" (13th). Nigel Forde examines early epic Biblical films.
0101 BBC: Special Feature. "The Stars and Stripes Forever" (6th). A tribute to John Philip Sousa, the "March King of America".
0111 Radio Moscow: Moscow Mailbag. See S 0111.
0125 Radio Netherlands: Music Break. See S 0225.
0132 Radio Moscow: Time Line. See S 0432.
0135 Radio Netherlands: East of Edam. See S 0235.
0145 BBC: Music Feature. "Capriccio". By English composer Stephen Oliver.

Tuesdays

0100 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0106 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0111 Radio Moscow: Focus on Asia and the Pacific. News and comments on events in the region.
0125 Radio Netherlands: Program Info. See S 0125.
0132 Radio Moscow: Music. See S 0632.
0137 Radio Netherlands: Newsline. See S 0037.
0144 Monitor Radio Int'l: Letterbox. See M 2344.
0151 Monitor Radio Int'l: Religious Article. See M 1151.
0152 Radio Netherlands: No Boundaries. Weekly focus on development issues.

Wednesdays

0100 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0106 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0111 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
0125 Radio Netherlands: Program Info. See S 0125.
0130 BBC: Feature. "Homeward Bound" (1st,8th,15th). An expatriot's return to America's heartland.
0130 BBC: Feature. "Science or Fiction?" (22nd,29th). NEW! Travel into the future with science journalist and science fiction writer John Gribbin.
0132 Radio Moscow: Music. See S 0632.
0137 Radio Netherlands: Newsline. See S 0037.
0144 Monitor Radio Int'l: Letterbox. See M 2344.
0151 Monitor Radio Int'l: Religious Article. See M 1151.
0152 Radio Netherlands: Encore! Reruns of the best programs from earlier seasons.

Thursdays

0100 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0106 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0111 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
0125 Radio Netherlands: Program Info. See S 0125.
0132 Radio Moscow: Interview. See S 0411.
0137 Radio Netherlands: Newsline. See S 0037.
0139 Radio Moscow: Music. See S 0632.
0144 Monitor Radio Int'l: Letterbox. See M 2344.
0151 Monitor Radio Int'l: Religious Article. See M 1151.
0152 Radio Netherlands: Research File. See M 1152.

Fridays

0100 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0106 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0111 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
0125 Radio Netherlands: Program Info. See S 0125.
0132 Radio Moscow: Interview. See S 0411.
0137 Radio Netherlands: Newsline. See S 0037.
0139 Radio Moscow: Music. See S 0632.
0144 Monitor Radio Int'l: Letterbox. See M 2344.
0151 Monitor Radio Int'l: Religious Article. See M 1151.
0152 Radio Netherlands: Research File. See M 1152.

Saturdays

0111 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
0125 Radio Netherlands: EuroPress Review. Five-minutes of EuroPress news.
0130 BBC: Feature (11th). See S 0430.
0132 Radio Moscow: Music. See S 0632.
0137 Radio Netherlands: Newsline. See S 0037.
0152 Radio Netherlands: Documentary. See W 1152.

0200 UTC [9:00 PM EST/6:00 PM PST]

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	11880pa	15320pa	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	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, RCI Montreal	6120na	9535am	9755na	11725na
		11845na	11940am		
0200-0300	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
0200-0300	Cuba, Radio Havana Cuba	6010na	13660na		
0200-0300	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0200-0300	Egypt, Radio Cairo	9475na	11660na		
0200-0215 smtwhf	Finland, YLE/Radio	11755na	15185na		
0200-0250	Germany, Deutsche Welle	7285as	9615as	9690as	9815as
		11865as	11945as		
0200-0300 as	Guam, KSDA AWR Agat	13720as			
0200-0300	Hungary, Radio Budapest	5970na	9835na	11910na	15220na
0200-0300 vl	Italy, IRRS Milano	7125na			
0200-0230 mtwhfa	Kenya, Kenya BC Corp	4935do			
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do			
0200-0300 vl	Mexico, Radio Educacion	6185am			
0200-0230	Myanmar, Radio	7185do			
0200-0300	Namibia, Namibia BC Corp	3290af			
0200-0300	Netherlands, Radio	9845as	9860as	11655as	
0200-0300	New Zealand, R NZ Intl	15120pa			
0200-0230 m	Norway, Radio Norway Intl	6120na	7165as		
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	5915am	7165am	7180am	7205am
		7335am	9620am	9750am	11970am
		12050as	13775as	15425am	17560am
		17570am	17590am	17655as	17665am
		17720am	17860am	17870am	17890as
		21490am	21585as	21690as	
0200-0230	Serbia, Radio Yugoslavia	9580na			
0200-0300	Singapore, SBC Radio One	5010do	5052do	11940do	
0200-0227	Slovakia, R Slovakia Intl	5930na	7310na	9810na	
0200-0300	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0200-0300	Taiwan, VO Free China	5950na	9680na	9765au	11740ca
		11860as	15345na		
0200-0300	Thailand, Radio	4830as	9655as	11905as	
0200-0300	United Kingdom,BBC London	5975na	6175na	6195me	7135me
		7155me	7325me	9410eu	9590na
		9630af	9915am	11705sa	11730af
		11750sa	11955me	15260sa	17790as
0200-0230	USA, KCBI Dallas TX	15375am			
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0230	USA, KVOH Los Angeles CA	17775am			
0200-0300	USA, Monitor Radio Intl	5850na	9430sa		
0200-0230 twhfa	USA, VOA Washington DC	5995sa	7115as	7405sa	9775ca
		11580sa	15120sa	15205sa	
0200-0300	USA, VOA Washington DC	7205as	11705as	15160sa	15250as
		17740as	21550sa		
0200-0300	USA, WEWN Birmingham AL	9825me			
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	5810am	5935am	7435am	
0200-0300	USA, WYFR Okeechobee FL	6065na	9505na	15440na	
0215-0255	Nepal, Radio	3230do	5005do	7165do	
0230-0245	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 mtwhf	Portugal, Radio	9570na	9705na		
0230-0300	Sweden, Radio	9695am	11705am		
0245-0300	Armenia, Radio Yerevan	10344na	11675na	11790na	13765na
		15330na			
0245-0300	United Kingdom,BBC London	6110sa	9515sa	9895sa	11965sa
		15390sa			
0250-0300	Vatican State, Vatican R	6095na	7305na	9605na	

SELECTED PROGRAMS

Sundays

0200 Christian Science Sentinel: Bible Lesson. See S 0100.
0211 Radio Moscow: Music and Musicians. World-famous per formers and composers play for you.
0225 Radio Netherlands: Music Break. Five-minutes of music at the end of an hour's program.
0229 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
0230 BBC: Feature. "The Divine Supermarket" (5th,12th,19th). American religious life today.
0230 BBC: Feature. Feature. "Gifts Unwrapped" (27th). The many rituals of gift-giving and receiving are revealed.
0235 Radio Netherlands: East of Edam. Lively mixture of off-beat interviews, music, and a touch of humor.

Mondays

0200 Christian Science Sentinel: Sunday from The Mother Church. See S 2300.
0211 Radio Moscow: Music and Musicians. See S 0211.
0225 Radio Netherlands: Music Break. See S 0225.
0235 Radio Netherlands: Happy Station. See S 0137.

Tuesdays

0200 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0206 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0211 Radio Moscow: Commonwealth Update. See M 2311.
0225 Radio Netherlands: Music Break. See S 0225.
0230 BBC: Comedy. (28th). See M 1215.
0230 BBC: Quiz. (7th,14th,21st). See M 1215.
0232 Radio Moscow: Folk Box. See M 0032.
0237 Radio Netherlands: Newsline. See S 0037.
0244 Monitor Radio Int'l: Letterbox. See M 2344.
0251 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
0252 Radio Netherlands: Research File. See M 1152.

Wednesdays

0200 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0206 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0211 Radio Moscow: Commonwealth Update. See M 2311.
0225 Radio Netherlands: Music Break. See S 0225.
0232 Radio Moscow: Music at Your Request. See M 1232.
0237 Radio Netherlands: Newsline. See S 0037.
0244 Monitor Radio Int'l: Letterbox. See M 2344.
0251 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
0252 Radio Netherlands: Mirror Images. See T 1152.

Thursdays

0200 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0206 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0211 Radio Moscow: Commonwealth Update. See M 2311.
0225 Radio Netherlands: Music Break. See S 0225.
0232 Radio Moscow: The Jazz Show. See M 0530.
0237 Radio Netherlands: Newsline. See S 0037.
0244 Monitor Radio Int'l: Letterbox. See M 2344.
0251 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
0252 Radio Netherlands: Documentary. See W 1152.
0252 Radio Netherlands: "Cutting Edge" (16th,23nd). See H 0052.

Fridays

0200 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0206 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0211 Radio Moscow: Commonwealth Update. See M 2311.
0225 Radio Netherlands: Music Break. See S 0225.
0230 BBC: Dramas. See H 1130.
0232 Radio Moscow: Music at Your Request. See M 1232.
0237 Radio Netherlands: Newsline. See S 0037.
0244 Monitor Radio Int'l: Letterbox. See M 2344.
0251 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Saturdays

0200 Christian Science Sentinel: Monitor Radio News. See M 2300.
0206 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
0211 Radio Moscow: Commonwealth Update. See M 2311.
0225 Radio Netherlands: Music Break. See S 0225.
0232 Radio Moscow: The Jazz Show. See M 0530.
0237 Radio Netherlands: Newsline. See S 0037.
0252 Radio Netherlands: Bats; Balls & Baselines. NEW! Sports results, news, issues, features, personality profiles, and investigations.

English language

shortwave guide

0300 UTC [10:00 PM EST/7:00 PM PST]

FREQUENCIES

0300-0400	Australia, AAF Radio	19037af	23678as		
0300-0400	Australia, ABC Brisbane	4920do	9660do		
0300-0400	Australia, ABC Perth	9610do			
0300-0400	Australia, Radio	11720pa	11880pa	15240pa	15320pa
		15365pa	17715pa	17750as	17795pa
		17880as	21525as	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			
0300-0330	Canada, CanForce Network	6000eu			
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	9770na	9780na	11715na
0300-0400	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
0300-0400	Costa Rica, Faro del Carib	5055do			
0300-0400	Cuba, Radio Havana Cuba	6010na	13660na		
0300-0330	Czech Republic, R Prague	5915na	5930na	7345na	9405na
		9810na			
0300-0400	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0300-0330	Egypt, Radio Cairo	9475na	11660na		
0300-0350	Germany, Deutsche Welle	6045na	6085na	6120na	9535na
		9545na	9640na		
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400 sm	Honduras, R Luz y Vida	3250ca			
0300-0315 vl	Italy, IRRS Milano	7125na			
0300-0400	Japan, NHK/Radio	11875na	15210am	15230am	15325am
		17810am	21610am		
0300-0400	Kenya, Kenya BC Corp	4935do			
0300-0400 mtwhf	Lebanon, Wings of Hope	11530me			
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do			
0300-0400 vl	Mexico, Radio Educacion	6185am			
0300-0400	New Zealand, R NZ Intl	15120pa			
0300-0330 m	Norway, Radio Norway Intl	6115na			
0300-0330	Philippines, R Pilipinas	17760as	17840as	21580as	
0300-0400 vl	PNG, Natl BC	4890do			
0300-0400	Russia, Radio Moscow Intl	5915am	7165am	7180am	7205am
		7270am	7335am	9710am	9750ra
		9860am	9905na	11690na	11775na
		12050na	15425na	17605am	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	9765au	11740as
		15345na			
0300-0400	Tanzania, Radio	5985af	9685af	11765af	
0300-0400	Thailand, Radio	9655as	11905as		
0300-0400 vl	Uganda, Radio	4976do			
0300-0330	United Kingdom, BBC London	7155me	11750sa	15260sa	15310as
		15380as			
0300-0400	United Kingdom, BBC London	3255af	5975na	6175na	6180eu
		6195eu	7230eu	7325na	9410eu
		9600af	11760me	11955me	12095ca
		15310me	15420af	21715as	
0300-0400	USA, KCBI Dallas TX	9815am			
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9785sa			
0300-0400	USA, Monitor Radio Intl	5850na	7465eu		
0300-0400	USA, VOA Washington DC	6065af	7105af	7265af	7280af
		7405af	9575af	9885af	
0300-0400	USA, WEWN Birmingham AL	7425am			
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	5810am	5935am	7435am	
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0315	Vatican State, Vatican R	6095na	7305na	9605na	
0315-0345	Vatican State, Vatican R	9695af	11625af		
0330-0400	Austria, R Austria Intl	9870sa	13730sa		
0330-0400	Netherlands, Radio	6165na	9590na		
0330-0400	Sweden, Radio	9695am	11650am		
0330-0400	UAE, Radio Dubai	11945na	13675na	15400eu	17890eu
		21485na			
0340-0350 mtwhfa	Greece, Voice of	9380na	9420na	11645na	
0345-0400	Tajikistan, Radio	7245eu			

SELECTED PROGRAMS

Sundays

0300 Christian Science Sentinel: Bible Lesson. See S 0100.
0311 Radio Moscow: Moscow Mailbag. See S 0111.
0329 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
0332 Radio Moscow: Your Top Tune. Win a prize by guessing which song of the three is the most popular.
0337 Radio Netherlands (na): Newsline. See S 0037.
0352 Radio Netherlands (na): Sounds Interesting. See S 0053.

Mondays

0300 Christian Science Sentinel: Sunday from The Mother Church. See S 2300.
0311 Radio Moscow: Moscow Mailbag. See S 0111.
0332 Radio Moscow: Time Line. See S 0432.
0335 Radio Netherlands (na): Happy Station. See M 0036.

Tuesdays

0300 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0306 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0311 Radio Moscow: Newmarket. See S 0611.
0330 Radio Moscow: Audio Book Club. See S 0132.
0337 Radio Netherlands (na): Newsline. See S 0037.
0344 Monitor Radio Int'l: Letterbox. See M 2344.
0351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
0352 Radio Netherlands (na): Research File. See T 0052.

Wednesdays

0300 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0306 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0311 Radio Moscow: Science and Engineering in the CIS. See S 0611.
0332 Radio Moscow: Russian by Radio. See M 2332.
0337 Radio Netherlands (na): Newsline. See S 0037.
0344 Monitor Radio Int'l: Letterbox. See M 2344.
0351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
0353 Radio Netherlands (na): Mirror Images. See W 0052.

Thursdays

0300 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0306 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0311 Radio Moscow: Moscow Mailbag. See S 0111.
0332 Radio Moscow: Audio Book Club. See S 0132.
0337 Radio Netherlands (na): Newsline. See S 0037.
0344 Monitor Radio Int'l: Letterbox. See M 2344.
0351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
0352 Radio Netherlands (na): Documentary. See H 0052.
0352 Radio Netherlands: "Cutting Edge" (16th,22nd). See H 0052.

Fridays

0300 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0306 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0311 Radio Moscow: Mailbag. See M 0611.
0332 Radio Moscow: Russian by Radio. See M 2332.
0337 Radio Netherlands (na): Newsline. See S 0037.
0344 Monitor Radio Int'l: Letterbox. See M 2344.
0351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Saturdays

0300 Christian Science Sentinel: Monitor Radio News. See M 2300.
0306 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
0311 Radio Moscow: Science and Engineering in the CIS. See S 0611.
0332 Radio Moscow: Audio Book Club. See S 0132.
0337 Radio Netherlands (na): Newsline. See S 0037.
0353 Radio Netherlands (na): Towards 2000. See A 0052.

English language

shortwave guide

0400 UTC [11:00 PM EST/8:00 PM PST]

FREQUENCIES

0400-0500	Australia, ABC Brisbane	4920do	9660do		
0400-0500	Australia, ABC Perth	9610do			
0400-0500	Australia, Radio	11720pa	11800pa	15240pa	15320pa
		15365pa	17715pa	17750as	17795pa
		21525as	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			
0400-0430	Canada, RCI Montreal	6105me	9505me	9670me	
0400-0500	China, China Radio Intl	11680na	11840na		
0400-0500 vl	Congo, R Natl Congolaise	4765do	5985do		
0400-0500	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
0400-0430	Croatian Radio via WHRI	7315na			
0400-0500	Cuba, Radio Havana Cuba	6010na	6180na	13660na	
0400-0430	Czech Republic, R Prague	5915na	5930na	7345na	9405na
		9810na	13715af		
0400-0430	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0400-0450	Germany, Deutsche Welle	6015af	6145af	7150af	7225af
		7275af	9565af	9765af	
0400-0430	Guatemala, Radio Cultural	3300do			
0400-0500	Kenya, Kenya BC Corp	4935do			
0400-0500 s	Lebanon, Wings of Hope	11530me			
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do			
0400-0500 vl	Mexico, Radio Educacion	6185am			
0400-0430	Netherlands, Radio	6165eu	9590eu		
0400-0500 vl	New Zealand, R NZ Intl	15120pa			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as	
0400-0500 vl	PNG, Natl BC	4890do			
0400-0430	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0400-0500	Russia, Radio Moscow Intl	5915na	7105na	7165na	7180na
		7205na	7305na	7335na	9610na
		9710am	9750eu	9860eu	9880na
		9905na	11690na	12030na	12050na
		15425na	15535na	17560na	17570as
		17655as	17775as	17835as	17880as
		17890as	21820as		
0400-0500	S Africa, Channel Africa	5960af	9730af		
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	Turkey, Voice of	9445na			
0400-0500 vl	Uganda, Radio	4976do			
0400-0430	United Kingdom, BBC London	6005eu	6180eu	7325na	9630af
		9915am	11760me	11955me	12095eu
		15310as	15575me	21725as	
0400-0500	United Kingdom, BBC London	3255af	3955eu	5975na	6005af
		6190af	6195eu	7325af	9410af
		9600af	11730af	11820af	21470af
		21715as			
0400-0500	USA, KCBI Dallas TX	9815am			
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9785am			
0400-0500	USA, Monitor Radio Intl	7465eu	9840af		
0400-0500	USA, VOA Washington DC	5995eu	6040eu	6140eu	7170eu
		7200eu	7265af	7280af	7405af
		9575af	11965eu	15205eu	
0400-0500	USA, WEWN Birmingham AL	7425am			
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	5810am	5935am	7435am	
0400-0500	USA, WYFR Okeechobee FL	6065na	9505na	11825eu	
0415-0440	Italy, RAI Rome	7275eu	9575eu		
0430-0450 s	Finland, YLE/Radio	6120eu	9665eu		
0430-0450	Finland, YLE/Radio	11755me	15440af		
0430-0500	Nigeria, Radio	3326do	4770do		
0430-0500	Russia, AWR Russia	15125eu			
0430-0500	Swaziland, Trans World R	3200af	7200af	7215af	
0430-0500	USA, VOA Washington DC	3980eu			
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

0400 Christian Science Sentinel: Bible Lesson. See S 0100.
0411 Radio Moscow (na): Interview. Talks with individuals about various subjects of current interest.
0411 Radio Moscow: News and Views. See S 0011.
0415 BBC: Feature. "Coast to Coast". Mike McShane continues his imaginary, musical trip from New York to Los Angeles.
0429 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
0430 BBC: Feature. "Seeing Stars" (7th). The Andromeda Galaxy other stellar news.
0430 BBC: Short Stories. "Guavas for Pudding" (12th), "Face the Fiddler" (19th), "Immigrant Women (26th). These are stories written by listeners.
0430 Radio Moscow: Radio Aum Shinrikyo. Paid religious program by a Japanese sect.
0432 Radio Moscow (na): Time Line. A variety program with an upbeat flair.
0445 BBC: Feature. "American Icons" (5th). Simon Boyce examines American logos and what they say about America.

Mondays

0411 Radio Moscow (na): Science and Engineering in the CIS. See S 0611.
0411 Radio Moscow: News and Views. See S 0011.
0415 BBC: Special Feature. "Images of Britain" (6th,13th,20th). How foreign journalists in the UK report about Britain.
0415 BBC: Special Feature. "Unconsidered Trifles" (27th). NEW! First of a series about people who collect just about anything you can think of.
0430 Radio Moscow: Radio Aum Shinrikyo. See S 0430.
0432 Radio Moscow (na): Audio Book Club. See S 0132.

Tuesdays

0400 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0406 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0411 Radio Moscow (na): Commonwealth Update. See M 2311.
0411 Radio Moscow: News and Views. See S 0011.
0430 Radio Moscow: Radio Aum Shinrikyo. See S 0430.
0432 Radio Moscow (na): Russian by Radio. See M 2332.
0444 Monitor Radio Int'l: Letterbox. See M 2344.
0445 BBC: On Screen. Besides the news and reviews from the film world, the secrets of special effects in films such as Jurassic Park and Terminator II are revealed.
0451 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Wednesdays

0400 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0406 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0411 Radio Moscow (na): Commonwealth Update. See M 2311.
0411 Radio Moscow: News and Views. See S 0011.
0430 Radio Moscow: Radio Aum Shinrikyo. See S 0430.
0432 Radio Moscow (na): Audio Book Club. See S 0132.
0444 Monitor Radio Int'l: Letterbox. See M 2344.
0451 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Thursdays

0400 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0406 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0411 Radio Moscow (na): Commonwealth Update. See M 2311.
0411 Radio Moscow: News and Views. See S 0011.
0430 Radio Moscow: Radio Aum Shinrikyo. See S 0430.
0432 Radio Moscow (na): Russian by Radio. See M 2332.
0444 Monitor Radio Int'l: Letterbox. See M 2344.
0451 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Fridays

0400 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0406 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0411 Radio Moscow (na): Commonwealth Update. See M 2311.
0411 Radio Moscow: News and Views. See S 0011.
0415 BBC: Classical Music Feature. See M 0145.
0430 Radio Moscow: Radio Aum Shinrikyo. See S 0430.
0432 Radio Moscow (na): Audio Book Club. See S 0132.
0444 Monitor Radio Int'l: Letterbox. See M 2344.
0451 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Saturdays

0400 Christian Science Sentinel: Monitor Radio News. See M 2300.
0406 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
0411 Radio Moscow (na): Commonwealth Update. See M 2311.
0411 Radio Moscow: News and Views. See S 0011.
0430 Radio Moscow: Radio Aum Shinrikyo. See S 0430.
0432 Radio Moscow (na): Interview. See S 0411.

English language **shortwave guide**

0500 UTC [12:00 AM EST/9:00 PM PST]

FREQUENCIES

0500-0600	Australia, ABC Brisbane	4920do	9660do		
0500-0600	Australia, ABC Perth	9610do			
0500-0530	Australia, Radio	17750as			
0500-0600	Australia, Radio	11720pa	11800pa	15240pa	15320pa
		15365pa	17715pa	17795pa	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			
0500-0600	Bulgaria, Radio	9700na	11720na		
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0600	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
0500-0515	Croatian Radio via WHRI	7315na	9495na		
0500-0600	Cuba, Radio Havana Cuba	6180na	9510na		
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0550	Germany, Deutsche Welle	5960na	9515na	9670na	11705na
0500-0515	Israel, Kol Israel	7465na	9435na	17545as	
0500-0600	Japan, NHK/Radio	6085me	7230eu	9725me	11740am
		11875na	15230na	15410am	17810am
0500-0600	Kenya, Kenya BC Corp	4935do			
0500-0600 mtwhf	Lebanon, Wings of Hope	11530me			
0500-0505	Lesotho, Radio	4800do			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600 vl	Mexico, Radio Educacion	6185am			
0500-0600 mtwhf	Namibia, Namibia BC Corp	3270af	3290af		
0500-0600	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	5905na	5915na	5930na	7105na
		7165na	7180na	7205na	7335na
		9610na	9750eu	9860eu	9880eu
		9905eu	12030na	12050na	15425na
		15535na	17655as	17730as	17775af
0500-0600	S Africa, Channel Africa	7230af	11745af		
0500-0600 vl	S Africa, Radio Oranje	7270do			
0500-0553 f	Seychelles, FEBA Radio	17750me			
0500-0600	Singapore, SBC Radio One	5052do	11940do		
0500-0515 vl	Somalia, R Free Somalia	7460do			
0500-0556	Spain, Spanish Natl Radio	9540na			
0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0500-0530	Swaziland, Trans World R	3200af	7200af	7215af	
0500-0515 mtwhf	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0500-0600	Thailand, Radio	4830as	9655as	11905as	
0500-0600 vl	Uganda, Radio	4976do			
0500-0600	United Kingdom, BBC London	3955eu	5975na	6005eu	6180eu
		6195eu	9410af	9600af	9640ca
		11735eu	11760me	11820as	12095af
		15070me	15310as	15400af	15420af
		15575me	17830as	21470af	21715as
0500-0600	USA, KCBI Dallas TX	9815am			
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9785am			
0500-0600	USA, Monitor Radio Intl	9840af			
0500-0600	USA, VOA Washington DC	3980eu	5995eu	6035af	6040eu
		6140eu	6873eu	7170eu	7405eu
		9530af	9665af	11965eu	12080af
		15205eu	15600af		
0500-0600	USA, WEWN Birmingham AL	7425am			
0500-0530	USA, WHRI Noblesville IN	7315na			
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	5985na	9850eu	11580af	
0500-0530	Vatican State, Vatican R	9695af	11625af	15090af	
0510-0520 mtwhfa	Botswana, Radio	3356af	4830af	7255af	
0525-0600	Ghana, GBC Radio 2	3366do			
0530-0600	Austria, R Austria Intl	6015na	6155eu	13730eu	15410me
		17870me			
0530-0600	Georgia, Georgian Radio	11910eu			
0530-0600	Romania, R Romania Intl	15340af	15380af	17720af	17745af
		17790af			
0530-0600 vl	Russia, Radio Centre	12010eu			
0530-0600	Swaziland, Trans World R	3200af	7200af	11740af	
0530-0600	UAE, Radio Dubai	15435as	17830as	21700as	

SELECTED PROGRAMS

Sundays

0511 Radio Moscow (na): News and Views. See S 0011.
0511 Radio Moscow: Top Priority. A weekly panel discussion of key events.
0530 Radio Moscow: Kaleidoscope. A variety of topics ranging from science and ecology to cultural matters.
0532 Radio Moscow (na): Moscow Medley. A musical program of a variety of musical types.

Mondays

0511 Radio Moscow (na): News and Views. See S 0011.
0511 Radio Moscow: Top Priority. See S 0511.
0530 Radio Moscow: The Jazz Show. The world of Russian jazz.
0532 Radio Moscow (na): The Jazz Show. See M 0530.

Tuesdays

0500 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0506 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0511 Radio Moscow (na): News and Views. See S 0011.
0511 Radio Moscow: Commonwealth Update. See M 2311.
0532 Radio Moscow (na): Music. See S 0632.
0532 Radio Moscow: Music. See S 0632.
0544 Monitor Radio Int'l: Letterbox. See M 2344.
0551 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Wednesdays

0500 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0506 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0511 Radio Moscow (na): News and Views. See S 0011.
0511 Radio Moscow: Commonwealth Update. See M 2311.
0532 Radio Moscow (na): The Jazz Show. See M 0530.
0544 Monitor Radio Int'l: Letterbox. See M 2344.
0551 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Thursdays

0500 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0506 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0511 Radio Moscow (na): News and Views. See S 0011.

0511 Radio Moscow: Commonwealth Update. See M 2311.
0532 Radio Moscow (na): Music at Your Request. See M 1232.
0544 Monitor Radio Int'l: Letterbox. See M 2344.
0551 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Fridays

0500 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0506 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0511 Radio Moscow (na): News and Views. See S 0011.
0511 Radio Moscow: Commonwealth Update. See M 2311.
0532 Radio Moscow (na): The Jazz Show. See M 0530.
0532 Radio Moscow: Music. See S 0632.
0544 Monitor Radio Int'l: Letterbox. See M 2344.
0551 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Saturdays

0500 Christian Science Sentinel: Monitor Radio News. See M 2300.
0506 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
0511 Radio Moscow (na): News and Views. See S 0011.
0511 Radio Moscow: Commonwealth Update. See M 2311.
0532 Radio Moscow (na): Folk Box. See M 0032.
0532 Radio Moscow: Music. See S 0632.

English language

shortwave guide

0600 UTC [1:00 AM EST/10:00 PM PST]

FREQUENCIES

0600-0700	Australia, ABC Brisbane	9660do			
0600-0700	Australia, ABC Perth	15425do			
0600-0700	Australia, Radio	6020pa	11720pa	11800pa	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			
0600-0630	Bulgaria, Radio	9700na	11720na		
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			
0600-0630 mtwtf	Canada, RCI Montreal	6050eu	6150eu	7155af	9740af
		9760af	11905af		
0600-0700	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
0600-0700	Cuba, Radio Havana Cuba	9510na			
0600-0700	Ecuador, HCJB Quito	11925am	15155am	21455am	
0600-0650	Germany, Deutsche Welle	11780af	13790af	15185af	15205af
		17875af			
0600-0615	Ghana, GBC Radio 1	4915do			
0600-0615	Ghana, GBC Radio 2	3366do			
0600-0700 vl	Italy, IRRS Milano	7125eu			
0600-0700	Japan, NHK/Radio	11860as	15325as	21610as	
0600-0625	Kenya, Kenya BC Corp	4935do			
0600-0700 vl	Kiribati, Radio	9825do			
0600-0630	Laos, National Radio of	7116as			
0600-0630 mtwhf	Lebanon, Wings of Hope	11530me			
0600-0700 as	Lebanon, Wings of Hope	11530me			
0600-0700	Liberia, Radio ELWA	4760do			
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V of Mediterranean	9765me			
0600-0700	Mexico, Radio Educacion	6185am			
0600-0700	Namibia, Namibia BC Corp	6175af			
0600-0700 vl	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	5905na	5915na	5930na	7105na
		7165na	7175na	7180na	7205na
		9750eu	9905eu	12030af	12050af
		15250na	15410na	17570am	17665na
		17675am	21690am		
0600-0700	S Africa, Channel Africa	7230af	17710af		
0600-0700 vl	S Africa, Radio Oranje	7270do			
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	3200af	7200af	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	
0600-0700	United Kingdom,BBC London	3955eu	5975ca	6190af	6195af
		7150pa	9410eu	9600af	9640na
		11780eu	11820af	11940af	12095eu
		15360as	15420af	15575eu	17790as
		17830as	17885af	21470me	
0600-0700	USA, KCBI Dallas TX	9815am			
0600-0700	USA, KTBN Salt Lk City UT	7510na			
0600-0700	USA, KVOH Los Angeles CA	9785na			
0600-0700	USA, Monitor Radio Intl	5850eu			
0600-0700	USA, VOA Washington DC	3980eu	5995eu	6005af	6035af
		6040eu	6060eu	6140eu	7170eu
		7325eu	7405af	9530af	9665af
		11805af	11925af	11965eu	12080af
		15600af			
0600-0700	USA, WEWN Birmingham AL	7425am			
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	5985na	7355eu	9680eu	11580af
0600-0620	Vatican State, Vatican R	6245eu	7250eu		
0603-0610	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0625-0700	Kenya, Kenya BC Corp	4935do			
0630-0700	Austria, R Austria Intl	6015na			
0630-0700	Italy, AWR Europe	7210eu			
0630-0700 smtwhf	New Zealand, ZLXA	3935do			
0630-0700	Vatican State, Vatican R	9625af	11625af	15090af	
0632-0641	Romania, R Romania Intl	7225eu	9510eu	9665eu	11810eu
0645-0700	Finland, YLE/Radio	6120eu	9560eu	11755eu	
0645-0700	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			

SELECTED PROGRAMS

Sundays

0611 Radio Moscow (na): Newmarket. This program tells where and how to invest in Russia, how to sell your product, or start a business.
0611 Radio Moscow: Science and Engineering in the CIS. The latest developments in science and technology.
0632 Radio Moscow (na): Music. Music as selected by Radio Moscow staff.
0632 Radio Moscow: Music. See S 0632.

Mondays

0611 Radio Moscow (na): Moscow Mailbag. See S 0111.
0611 Radio Moscow: Mailbag. Answering listener questions.
0632 Radio Moscow (na): Music. See S 0632.
0632 Radio Moscow: Pacific Ocean Region. Economic and politi cal developments in the Asia/Pacific Ocean region.
0645 Radio Moscow: Your Top Tune. See S 0332.

Tuesdays

0600 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0606 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0611 Radio Moscow (na): Commonwealth Update. See M 2311.
0611 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
0632 Radio Moscow (na): Russian by Radio. See M 2332.
0632 Radio Moscow: Music. See S 0632.
0644 Monitor Radio Int'l: Letterbox. See M 2344.
0651 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Wednesdays

0600 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0606 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0611 Radio Moscow (na): Commonwealth Update. See M 2311.
0611 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
0632 Radio Moscow (na): Audio Book Club. See S 0132.
0632 Radio Moscow: Interview. See S 0411.
0639 Radio Moscow: Music. See S 0632.
0644 Monitor Radio Int'l: Letterbox. See M 2344.
0651 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Thursdays

0600 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0606 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0611 Radio Moscow (na): Commonwealth Update. See M 2311.
0611 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
0632 Radio Moscow (na): Russian by Radio. See M 2332.
0632 Radio Moscow: Interview. See S 0411.
0639 Radio Moscow: Music. See S 0632.
0644 Monitor Radio Int'l: Letterbox. See M 2344.
0651 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Fridays

0600 Monitor Radio Int'l: Monitor Radio News. See M 2300.
0606 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
0611 Radio Moscow (na): Commonwealth Update. See M 2311.
0611 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
0632 Radio Moscow (na): Audio Book Club. See S 0132.
0632 Radio Moscow: Music. See S 0632.
0644 Monitor Radio Int'l: Letterbox. See M 2344.
0651 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Saturdays

0611 Radio Moscow (na): Commonwealth Update. See M 2311.
0611 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
0632 Radio Moscow (na): Interview. See S 0411.
0632 Radio Moscow: Music. See S 0632.

English language

shortwave guide

0700 UTC [2:00 AM EST/11:00 PM PST]

0700-0800	Australia, ABC Brisbane	4920do	9660do		
0700-0800	Australia, ABC Perth	15425pa			
0700-0730	Australia, Radio	15320pa	17715pa	21740pa	
0700-0800	Australia, Radio	6020eu	9710pa	11720pa	11880pa
		15240pa	15365pa	17695as	17715pa
		17790as	21525as	21595as	
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 Peace Intl	7375am	7385am	15030am	21465am
0700-0730	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
0700-0800	Ecuador, HCJB Quito	9600eu	11835eu	21455eu	
0700-0715	Ghana, GBC Radio 1	4915do			
0700-0715	Ghana, GBC Radio 2	3366do			
0700-0800 vl	Italy, IRRS Milano	7125am			
0700-0800	Japan, NHK/Radio	6050as	7230au	11740au	15170as
		15325au	15410au	17765as	17810as
		17860as	21575me	21610me	
0700-0800	Kenya, Kenya BC Corp	4935do			
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0730	Myanmar, Radio	9730do			
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	11775pa	15250pa	15335pa	17720pa
		17805pa			
0700-0800	Russia, AWR Russia	11835eu			
0700-0800	Russia, Radio Moscow Intl	5905eu	5930eu	7175eu	9610eu
		9710eu	11710me	13705am	15140af
		15225am	17560af	17570af	17660am
		17735am	21690af		
0700-0755 vl	S Africa, Radio Oranje	7270do			
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	
0700-0800	United Kingdom,BBC London	3955eu	5975ca	6190af	6195eu
		7150af	7325eu	9410eu	9640na
		9660eu	9760eu	11760me	11780ca
		11940af	12095eu	15070eu	15310as
		15400af	15575me	17790af	17885af
		21470af	21660af		
0700-0800	USA, KCBI Dallas TX	9815na			
0700-0800	USA, KTBN Salt Lk City UT	7510na			
0700-0800	USA, KVOH Los Angeles CA	9785na			
0700-0800	USA, Monitor Radio Intl	5850eu			
0700-0800	USA, WEWN Birmingham AL	7425am			
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	7355eu	9680eu	11580af	
0703-0715	Croatia, Croatian Radio	6145eu	9830eu	13640eu	
0730-0800	Australia, Radio	17750as			
0730-0755	Belgium, R Vlaanderen Int	5910eu	9925au		
0730-0800	Czech Republic, R Prague	11990pa	13590as	15605as	17535as
		21705as			
0730-0800	Georgia, Georgian Radio	11910me			
0730-0745 mtwhf	Iceland, Natl BC Service	9265om			
0730-0800	Netherlands, Radio	9630pa	9720pa		
0740-0800	Monaco, Trans World Radio	7385eu			

0800 UTC [3:00 AM EST/12:00 AM PST]

0800-0900	Australia, ABC Brisbane	9660do			
0800-0900	Australia, ABC Perth	15425do			
0800-0900	Australia, Radio	6080pa	7240pa	9710as	15240pa
		17695as	17750as	21525as	21595as
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 Peace Intl	7385am	15030am	21465am	
0800-0830	Ecuador, HCJB Quito	9600eu	9745pa	11835eu	11925pa
		17490au	21455eu		
0800-0900	Finland, YLE/Radio	17800as	21550as		
0800-0805 s	Ghana, GBC Radio 1	4915do			
0800-0805 s	Ghana, GBC Radio 2	3366do			
0800-0900 asmtwh	Guam, KTWR Agana	15200as			
0800-0900	Indonesia, Voice of	9675as	11752au		
0800-0900 vl	Italy, IRRS Milano	7125eu			
0800-0900	Kenya, Kenya BC Corp	4935do			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0900	Monaco, Trans World Radio	7385eu			
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		
0800-0830 s	Norway, Radio Norway Intl	15175as	17740pa		
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	7315eu	17560af	17645af	17660af
		17735am	17760am	17890am	21450am
		21465am	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	
0800-0835	Swaziland, Trans World R	7200af	11740af		
0800-0900	United Kingdom,BBC London	3955eu	6190af	7325eu	9410eu
		9640na	9660eu	9760eu	11760me
		11940af	15400af	15575me	17790as
		17885af	21470af	21660af	
0800-0900	USA, KCBI Dallas TX	9815am			
0800-0900 vl	USA, KNLS Anchor Point AK	7365as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, Monitor Radio Intl	13615pa			
0800-0900	USA, WEWN Birmingham AL	9350am	9985am		
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	
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	15450as	
0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0830-0900	Georgia, Georgian Radio	11910eu			
0830-0900	Netherlands, Radio	9720pa			
0830-0857	Slovakia, R Slovakia Intl	11990au	15605au	17535au	21705au
0835-0850 mtwhf	Swaziland, Trans World R	11740af			
0845-0900 s	Armenia, Radio Yerevan	15170na	15510na	17770na	

English language

shortwave guide

0900 UTC [4:00 AM EST/1:00 AM PST]

0900-0950	Australia, AAF Radio	20418as	25322af		
0900-1000	Australia, ABC Brisbane	4920do	9660do		
0900-1000	Australia, Radio	5995pa	9510as	9580pa	13605as
		15170as	21745as		
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			
0900-1000	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	11755pa	15440pa	17710pa	
0900-1000	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
0900-1000	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
0900-0950	Germany, Deutsche Welle	6160as	11715as	17780as	17820as
		21650as	21680as		
0900-0915 mtwtf	Ghana, GBC Radio 1	4915do			
0900-0915	Ghana, GBC Radio 2	3366do			
0900-1000	Guam, KTWR Agana	11805pa			
0900-0915 vl	Italy, IRRS Milano	7125eu			
0900-1000	Japan, NHK/Radio	9750as	11740as	11815as	11910as
		15240pa	17860as		
0900-1000	Kenya, Kenya BC Corp	4935do			
0900-1000 mtwhf	Lebanon, King of Hope	6280me			
0900-1000	Malaysia, RTM Radio 4	7295do			
0900-0920 mtwhf	Monaco, Trans World Radio	7385eu			
0900-0935 a	Monaco, Trans World Radio	7385eu			
0900-0945 s	Monaco, Trans World Radio	7385eu			
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	7205af	9750af	11805as	11970af
		12010as	12015as	15490af	17560af
		17645af	17660af	17735am	17760am
		17890af	21690am		
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
0900-1000	United Kingdom,BBC London	6190af	6195eu	9410eu	9660eu
		9750eu	9760eu	11760me	11940af
		12095eu	15070eu	15190sa	15310as
		15400af	15575me	17640eu	17705eu
		17790af	17885af	21470af	21660af
0900-1000	USA, KCBI Dallas TX	9815am			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, Monitor Radio Intl	7395am	9840pa	13615au	17555as
0900-1000	USA, WEWN Birmingham AL	9370eu			
0900-1000	USA, WHRI Noblesville IN	7315am	7355am		
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WWCR Nashville TN	5935am			
0910-0940 smha	Mongolia, R Ulaanbaatar	11850as	12015as		
0915-1000	Ghana, GBC Radio 2	6130do	7295do		
0915-0930 smtwh	Guam, KTWR Agana	15200as			
0930-1000	Italy, AWR Europe	7230eu			
0930-1000	Netherlands, Radio	7260as	9720pa	9810as	9865pa
0930-0957	Slovakia, R Slovakia Intl	11990au	15605au	17535au	21705au
0940-0950	Greece, Voice of	15650au	17525au		

1000 UTC [5:00 AM EST/2:00 AM PST]

1000-1100	Australia, ABC Brisbane	4920do			
1000-1100	Australia, Radio	5995pa	9580pa	15170as	21745as
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			
1000-1025 mtwtfa	Belgium, R Vlaanderen Int	9905eu	17515eu	21815af	
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	11755pa	15440pa	17710pa	
1000-1100	Costa Rica, AWR Alajuela	9725ca			
1000-1100	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
1000-1100	Ghana, GBC Radio 2	6130do	7295do		
1000-1100	India, All India Radio	15050as	17387au	17895as	21735au
1000-1100 vl	Italy, IRRS Milano	7125eu			
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		
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, Radio	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1030 s	Norway, Radio Norway Intl	17840eu	21705af		
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	11800eu	15140eu	15225na	15350me
		15355eu	15470eu	15490as	15520as
		17705as	17760as	17790na	21465as
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		
1000-1100	United Kingdom,BBC London	6190af	6195af	9410eu	9660eu
		9740eu	9750eu	9760eu	11760me
		11940af	12095eu	15070eu	15190sa
		15310as	15400af	15575me	17640eu
		17705eu	17790af	17885af	21470af
		21660af			
1000-1100	USA, KCBI Dallas TX	9815am			
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, Monitor Radio Intl	7395am	9430as	9840am	13625pa
1000-1100	USA, VOA Washington DC	5985pa	7405ca	9590ca	11720pa
		11915ca	15120ca	15425as	
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	5950na			
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1003-1006	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
1030-1100 mtwtfa	Austria, R Austria Intl	6155eu	13730eu	15450au	17870as
1030-1100	Netherlands, Radio	7260as	9810as		
1030-1100	South Korea, Radio Korea	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1030-1100	UAE, Radio Dubai	13675eu	15320eu	15435eu	21605eu
1040-1050	Greece, Voice of	15650as	17525as		

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Monitoring Times

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Bill Clarke
73 Amateur Radio Today

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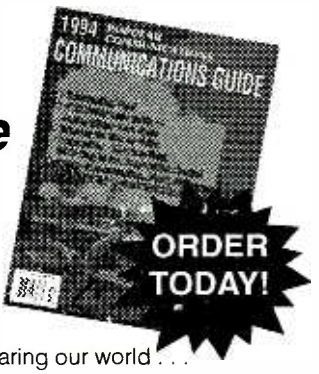

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English language

shortwave guide

1100 UTC [6:00 AM EST/3:00 AM PST]

FREQUENCIES

1100-1200	Australia, ABC Brisbane	4920do			
1100-1200	Australia, Radio	5995pa	6020pa	6080as	7240pa
		9510as	9580pa	9710as	13605as
		15170as	17910as		
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	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 Peace Intl	7375am	7385am	15030am	21465am
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
1100-1150	Germany, Deutsche Welle	15370af	15410af	17715af	17765af
		17800af	17860af	21465af	21600af
1100-1115	Ghana, GBC Radio 1	4915do			
1100-1130	Israel, Kol Israel	15640eu	15650as	17575eu	
1100-1200 vl	Italy, IRRS Milano	7125eu			
1100-1200	Japan, NHK/Radio	6120na	11910as	15240as	
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		
1100-1200	New Zealand, R NZ Intl	9700pa			
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	15125as	15140me	15155as	15210as
		15280as	15290as	15380na	15440na
		15465as	15500as	15520me	15540as
		15590as	17590na	17660me	17670me
		17675na	17705as	17755me	17760na
		17780me	21465as		
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	21820as
1100-1200	Taiwan, Voice of Asia	7445as			
1100-1200	United Kingdom, BBC London	5965na	5975na	6190af	6195na
		9410eu	9515na	9660eu	9740na
		9750eu	9760eu	11760me	11940af
		12095eu	15070eu	15220na	15310as
		15400af	17640eu	17705eu	17790sa
		17885me	21470af	21660af	
1100-1200	USA, KCBI Dallas TX	9815am			
1100-1200	USA, KTBN Salt Lk City UT	7510na			
1100-1200	USA, Monitor Radio Intl	7395am	7465am	9430pa	
1100-1200	USA, VOA Washington DC	5985pa	6110as	7405ca	9590ca
		9760as	11720pa	11915ca	15120ca
		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		
1120-1130	Vatican State, Vatican R	11740af	15210me	21665eu	
1130-1200	Bulgaria, Radio	11645eu	13645eu		
1130-1157	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
		15355eu			
1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1130-1150 mtwhf	Finland, YLE/Radio	11735na	15400na		
1130-1200	Iran, VOIRI Tehran	9525me	11715me	11790me	11910as
		11930as			
1130-1200	Netherlands, Radio	5955eu	9850eu		
1130-1200	Serbia, Radio Yugoslavia	21605au			
1130-1200	Thailand, Radio	4830as	9655as	11905as	
1130-1200	Vietnam, Voice of	6115as	10059as	12025as	15010as

SELECTED PROGRAMS

Sundays

1100 Christian Science Sentinel: Bible Lesson. See S 0100.
1129 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
1132 Radio Moscow: Audio Book Club. See S 0132.
1135 Radio Netherlands: Happy Station. See S 0137.

Mondays

1100 Monitor Radio Int'l: Monitor Radio Early Edition. NEW! The morning news magazine program is heard from 1000 UTC to 1500 UTC weekdays.
1111 Radio Moscow: Science and Engineering in the CIS. See S 0611.
1132 Radio Moscow: Music. See S 0632.
1137 Radio Netherlands: Newsline. See S 0037.
1151 Monitor Radio Int'l: Religious Article from the CSM. As published in the christian Science Monitor.
1152 Radio Netherlands: Research File. A program of science and technology.

Tuesdays

1100 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1111 Radio Moscow: Commonwealth Update. See M 2311.
1132 Radio Moscow: Russian by Radio. See M 2332.
1137 Radio Netherlands: Newsline. See S 0037.
1151 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1152 Radio Netherlands: Mirror Images. Weekly magazine of arts and culture.

Wednesdays

1100 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1111 Radio Moscow: Commonwealth Update. See M 2311.
1132 Radio Moscow: Audio Book Club. See S 0132.
1137 Radio Netherlands: Newsline. See S 0037.
1151 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1152 Radio Netherlands: Documentary. An in-depth treatment of one subject or a short series.
1152 Radio Netherlands: "Cutting Edge" (15th,22nd). See H 0052.

Thursdays

1100 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1111 Radio Moscow: Commonwealth Update. See M 2311.
1130 BBC: Drama. "Galahad at Blandings" (23rd,30th). A four-part adaptation of a novel by P. G. Wodehouse set in the peaceful English countryside of the '20s.
1130 BBC: Drama. F. Scott Fitzgerald Stories: "What a Hand some Pair!" (2nd), "Two Wrongs" (9th), "The Ice Palace" (16th).
1132 Radio Moscow: Russian by Radio. See M 2332.
1137 Radio Netherlands: Newsline. See S 0037.
1151 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Fridays

1100 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1111 Radio Moscow: Commonwealth Update. See M 2311.
1132 Radio Moscow: Audio Book Club. See S 0132.
1137 Radio Netherlands: Newsline. See S 0037.
1151 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1152 Radio Netherlands: Towards 2000. A focus on the global aspects of social change.

Saturdays

1100 Christian Science Sentinel: Monitor Radio News. See M 2300.
1106 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
1111 Radio Moscow: Commonwealth Update. See M 2311.
1132 Radio Moscow: Music. See S 0632.
1137 Radio Netherlands: Newsline. See S 0037.
1152 Radio Netherlands: Sounds Interesting. See S 0052.

1200 UTC [7:00 AM EST/4:00 AM PST]

FREQUENCIES

1200-1300	Australia, AAF Radio	9194as			
1200-1300	Australia, ABC Brisbane	4920do			
1200-1300	Australia, ABC Perth	6140do	9610do		
1200-1230	Australia, Radio	6020pa	6080as	9710as	
1200-1300	Australia, Radio	5995pa	7240pa	9580pa	17910as
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	15445na			
1200-1300	Bulgaria, Radio	11645eu	13645eu		
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			
1200-1300	China, China Radio Intl	9715as	11660as	11795as	15210na
		15440na			
1200-1300	Costa Rica, AWR Alajuela	9725ca	11870ca		
1200-1300	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455om			
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	9700pa			
1200-1300	Nigeria, Radio	4990do	7285do		
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	11705af	11800me	11985af	15155as
		15210as	15280na	15380as	15440me
		15455as	15470as	15520na	15525na
		15550me	17570na	17595na	17645na
		17705na	17760na	17790na	17815me
		21465me	21785me		
1200-1300 vl	S Africa, Radio Oranje	9630do			
1200-1300	Singapore, SBC Radio One	5010do	5052do	11940do	
1200-1245	South Korea, Radio Korea	9640na			
1200-1230	Thailand, Radio	4830as	9655as	11905as	
1200-1300	United Kingdom,BBC London	6190af	6195am	9410eu	9515na
		9660eu	9740na	9750eu	9760eu
		11760me	11940af	12095eu	15070eu
		15220na	15310as	15400af	15575me
		17640eu	17705eu	17790af	17885af
		21470af	21660af		
1200-1300	USA, KCBI Dallas TX	9815am			
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, Monitor Radio Intl	7465am	9425pa	9455na	13625as
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	5950na	7355na	11830na	11970na
1200-1225	Uzbekhistan, R Tashkent	7285as	9715as	15295as	17815as
1200-1300	Vietnam, Voice of	6115as	10059as	12025as	15010as
1207-1300 ocasnal	New Zealand, R NZ Intl	9510pa			
1215-1300	Egypt, Radio Cairo	17595as			
1220-1230 vl	Ghana, GBC Radio 1	4915do			
1230-1300	Austria, R Austria Intl	6155eu	13730na	15450as	
1230-1300	Bangladesh, Radio	13615eu	15220eu		
1230-1300	Canada, RCI Montreal	6150as	11730as		
1230-1300	Finland, YLE/Radio	11900na	15400na		
1230-1255	France, Radio France Intl	9805eu	11670eu	15155eu	15195eu
		15365na	17575na		
1230-1300	Ghana, GBC Radio 2	6130do	7295do		
1230-1300	Netherlands, Radio	5955eu	9650eu		
1230-1300	Sri Lanka, SLBC Colombo	6075as	9720as		
1230-1300	Sweden, Radio	15240au	17740au	17865as	
1230-1300	USA, VOA Washington DC	11805as			

SELECTED PROGRAMS

Sundays

1200 Christian Science Sentinel: Bible Lesson. See S 0100.
1201 BBC: Play of the Week. See S 0101.
1211 Radio Moscow: News and Views. See S 0011.
1225 Radio Netherlands: Program Info. See S 0125.
1229 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
1232 Radio Moscow: Kaleidoscope. See S 0530.
1235 Radio Netherlands: East of Edam. See S 0235.

Mondays

1200 Monitor Radio Int'l: Early Edition. See M 1100.
1211 Radio Moscow: News and Views. See S 0011.
1215 BBC: Comedy. "Jarvis' Frayn" (27th). A selection of sketches performed by Martin Jarvis.
1215 BBC: Quiz. "Hoax" (6th,13th,20th). Guess which extraordinary tale is the true one.
1225 Radio Netherlands: Dutch Press Review. See S 1525.
1232 Radio Moscow: Music at Your Request. Music as requested by listeners.
1237 Radio Netherlands: Newsline. See S 0037.
1251 Monitor Radio Int'l: Religious Article. See M 1151.
1252 Radio Netherlands: Let's Get to Business. Down-to-earth program of trade and business with Barry O'Dwyer.

Tuesdays

1200 Monitor Radio Int'l: Early Edition. See M 1100.
1211 Radio Moscow: News and Views. See S 0011.
1225 Radio Netherlands: Dutch Press Review. See S 1525.
1232 Radio Moscow: Folk Box. See M 0032.
1237 Radio Netherlands: Newsline. See S 0037.
1251 Monitor Radio Int'l: Religious Article. See M 1151.
1252 Radio Netherlands: No Boundaries. See T 0152.

Wednesdays

1200 Monitor Radio Int'l: Early Edition. See M 1100.
1211 Radio Moscow: News and Views. See S 0011.
1225 Radio Netherlands: Dutch Press Review. See S 1525.
1232 Radio Moscow: Music. See S 0632.
1235 BBC: Special Feature. See M 1635.
1237 Radio Netherlands: Newsline. See S 0037.
1251 Monitor Radio Int'l: Religious Article. See M 1151.
1252 Radio Netherlands: Encore! See W 0152.

Thursdays

1200 Monitor Radio Int'l: Early Edition. See M 1100.
1211 Radio Moscow: News and Views. See S 0011.
1225 Radio Netherlands: Dutch Press Review. See S 1525.
1232 Radio Moscow: The Jazz Show. See M 0530.
1237 Radio Netherlands: Newsline. See S 0037.
1251 Monitor Radio Int'l: Religious Article. See M 1151.
1252 Radio Netherlands: Research File. See M 1152.

Fridays

1200 Monitor Radio Int'l: Early Edition. See M 1100.
1211 Radio Moscow: News and Views. See S 0011.
1215 BBC: Feature. "Free at Last" (3rd,10th,17th). The experiences of black people in America are examined by Mike West in his travel across the U.S.
1215 BBC: Feature. "In Search of the Green Man" (24th). The mysterious creature which appears in early civilizations.
1215 BBC: Feature. "You Know It Makes Sense" (31st). NEW! This six-parter investigates the senses of sight, tast, hearing, smell, touch, and the sixth sense of perception.
1225 Radio Netherlands: Dutch Press Review. See S 1525.
1232 Radio Moscow: Yours for the Asking. See T 0032.
1237 Radio Netherlands: Newsline. See S 0037.
1251 Monitor Radio Int'l: Religious Article. See M 1151.
1252 Radio Netherlands: Documentary. See W 1152.

Saturdays

1200 Christian Science Sentinel: Monitor Radio News. See M 2300.
1206 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
1211 Radio Moscow: News and Views. See S 0011.
1225 Radio Netherlands: EuroPress Review. See A 0125.
1232 Radio Moscow: Music at Your Request. See M 1232.
1237 Radio Netherlands: Newsline. See S 0037.
1252 Radio Netherlands: Bats; Balls & Baselines. See A 0252.

English language

shortwave guide

1300 UTC [8:00 AM EST/5:00 AM PST]

FREQUENCIES

1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, Radio	5995pa	7240pa	9580pa	11800pa
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			
1300-1320	Brazil, Radiobras	15445na			
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	China, China Radio Intl	7405na	9715as	11660as	11855as
		15440pa			
1300-1400	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455am			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400 as	Finland, YLE/Radio	15400na	21550na		
1300-1330	Ghana, GBC Radio 1	4915do			
1300-1400 vl	Italy, IRRS Milano	7125as			
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 ocasnal	New Zealand, R NZ Intl	9510pa			
1300-1400	Nigeria, Radio	4990do	7285do		
1300-1350	North Korea, R Pyongyang	9345eu	9640as	11740as	15230as
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	7195as	7295as	9825am	9885am
		9895am	11705as	11710as	11985as
		15125na	15210as	15380as	15440as
		15455as	15470me	15480as	15540as
		15550as	17570me	17595me	17705as
		17760as	17790as	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	7480as	11690as	13635as	15505as
		17670as	21770as		
1300-1400	United Kingdom,BBC London	6190af	6195am	7180as	9410eu
		9515na	9660eu	9740na	9750eu
		9760eu	11750as	11760me	11820na
		11940af	12095eu	15070eu	15220na
		15310as	15400af	15420af	15575me
		17640eu	17705eu	17790af	17885af
		21470af	21660af		
1300-1400	USA, KJES Mesquite NM	11715am			
1300-1400 vl	USA, KNLS Anchor Point AK	7355as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400	USA, Monitor Radio Intl	7465na	13625as		
1300-1400	USA, VOA Washington DC	6110as	9760as	15160as	15425as
1300-1330	USA, VOA Washington DC	11715as	11805as		
1300-1400	USA, WEWN Birmingham AL	9350am			
1300-1400	USA, WHRI Noblesville IN	9465na	15105na		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WWCR Nashville TN	13845am	15685am		
1300-1400	USA, WYFR Okeechobee FL	5950na	9705na	11550as	11830na
		11970na	13695na		
1300-1330	Vietnam, Voice of	6115as	10059as	12025as	15010as
1315-1325	Nepal, Radio	3230do	5005do	7165do	
1325-1400 mtwhf	Kenya, Kenya BC Corp	4935do			
1330-1400	Austria, R Austria Intl	15450as			
1330-1355 mtwtfa	Belgium, R Vlaanderen Int	17555na	21810na		
1330-1357	Canada, RCI Montreal	6150as	9435as		
1330-1400 mtwhf	Finland, YLE/Radio	11900na	15400na	17740na	21550na
1330-1400 tw	Ghana, GBC Radio 1	4915do			
1330-1400	India, All India Radio	11760as	15120as		
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands, Radio	9895as	13700as	15530as	
1330-1400	Sweden, Radio	15240am	17870am		
1330-1400	Turkey, Voice of	9675as			
1330-1400	UAE, Radio Dubai	13675eu	15320eu	15435as	21605as
1330-1355	Uzbekhistan, R Tashkent	7285as	9715as	15295as	17815as
1345-1400 vl	Myanmar, Radio	7185do			
1345-1400	Vatican State, Vatican R	15090as	17525au		

SELECTED PROGRAMS

Sundays

1300 Christian Science Sentinel: Bible Lesson. See S 0100.
1311 Radio Moscow: Music and Musicians. See S 0211.
1329 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
1335 Radio Netherlands: Happy Station. See S 0137.

Mondays

1300 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1308 Radio Netherlands: CDutch. Dutch concert music.
1311 Radio Moscow: Top Priority. See S 0511.
1332 Radio Moscow: Music. See S 0632.
1337 Radio Netherlands: Newsline. See S 0037.
1351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1352 Radio Netherlands: Research File. See M 1152.

Tuesdays

1300 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1311 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
1332 Radio Moscow: Interview. See S 0411.
1337 Radio Netherlands: Newsline. See S 0037.
1339 Radio Moscow: Music. See S 0632.
1351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1352 Radio Netherlands: No Boundaries. See T 0152.

Wednesdays

1300 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1311 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
1332 Radio Moscow: Music. See S 0632.
1337 Radio Netherlands: Newsline. See S 0037.
1351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1352 Radio Netherlands: Documentary. See W 1152.

Thursdays

1300 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1311 Radio Moscow: Focus on Asia and the Pacific. See T 0111.

1332 Radio Moscow: Commonwealth News. News about the countries of the Commonwealth of Independent States (CIS).
1337 Radio Netherlands: Newsline. See S 0037.
1339 Radio Moscow: Music. See S 0632.
1351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Fridays

1300 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1311 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
1337 Radio Netherlands: Newsline. See S 0037.
1351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1352 Radio Netherlands: Towards 2000. See F 1152.

Saturdays

1300 Christian Science Sentinel: Monitor Radio News. See M 2300.
1306 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
1311 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
1332 Radio Moscow: Your Top Tune. See S 0332.
1337 Radio Netherlands: Newsline. See S 0037.
1350 Radio Moscow: Interview. See S 0411.
1352 Radio Netherlands: Sounds Interesting. See S 0052.

English language

shortwave guide

1400 UTC [9:00 AM EST/6:00 AM PST]

FREQUENCIES

1400-1450	Australia, AAF Radio	13508af				
1400-1500	Australia, ABC Brisbane	4920do				
1400-1500	Australia, ABC Perth	6140do				
1400-1500	Australia, Radio	5995pa	7240pa	9580pa	11800pa	
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				
1400-1425 mtwhfa	Belgium, R Vlaanderen Int	17555na	21810as			
1400-1500	Bulgaria, Radio	11630na				
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	China, China Radio Intl	7405na	11815as	11855as	15165as	
1400-1500	Costa Rica, R Peace Intl	7375am	7385am	15030am		
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am	21455am
1400-1500	France, Radio France Intl	11910as	17650me	17695eu		
1400-1420	Ghana, GBC Radio 1	4915do				
1400-1500	Ghana, GBC Radio 2	6130do	7295do			
1400-1500 mtwhfa	Honduras, R Copan Intl	15675am				
1400-1500	India, All India Radio	11760as	15120as			
1400-1425 mtwh	Israel, Kol Israel	15640na	15650as			
1400-1500 vl	Italy, IRRS Milano	7125as				
1400-1500	Japan, NHK/Radio	9535as	9750as	11735am	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	7160do			
1400-1500	Malta, V of Mediterranean	11925eu				
1400-1500 mtwhf	Morocco, RTV Marocaine	17595af				
1400-1500 vl	Myanmar, Radio	7185do				
1400-1500	Netherlands, Radio	9895as	13700as	15530as		
1400-1500 ocasnal	New Zealand, R NZ Intl	9510pa				
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	5930as	6165as	7105as	7195as	
		7315as	7345as	7355as	9550as	
		9705am	9830as	11705as	11940as	
		11995am	15110as	15125af	15210af	
		15380as	15455af	15480as	15500as	
		17570af	17685as	17760am	17790am	
1400-1500 vl	Rwanda, Radiodiff Rwanda	9610do				
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			
1400-1500	United Kingdom,BBC London	6190af	6195am	7180as	9410eu	
		9515na	9660eu	9740as	9760eu	
		11750as	11820as	11940af	12095eu	
		15070eu	15260na	15310as	15400af	
		15575me	17640af	17705eu	17790af	
		17840na	17880af	21470af	21660af	
1400-1500	USA, KCBI Dallas TX	15725am				
1400-1500	USA, KJES Mesquite NM	11715na				
1400-1500	USA, KTBN Salt Lk City UT	7510na				
1400-1500	USA, Monitor Radio Intl	9455na	9530as			
1400-1500	USA, VOA Washington DC	6110as	7125as	9760as	15160as	
		15255eu	15395as	15425as		
1400-1500	USA, WEWN Birmingham AL	9350am	17510eu			
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	9705na	11550as	11830na	17760na	
1400-1405	Vatican State, Vatican R	15090as	17525au			
1415-1500	Bhutan, BC Service	5025do				
1415-1425	Nepal, Radio	3230do	5005do	7165do		
1430-1500	Afghanistan, Radio	7200as				
1430-1500	Australia, Radio	6060pa	6080as	7260as	9510as	11680as
1430-1500	Canada, RCI Montreal	9555eu	11915af	11935me	15315eu	15325me
		17820af				
1430-1500	Ecuador, HCJB Quito	11925am	17490am	17890am	21455am	
1430-1500	Finland, YLE/Radio	15400na	17740na			
1430-1500 m	Indonesia, RRI Padang	4003pa				
1430-1500	Myanmar, Radio	5990do				
1430-1500	Netherlands, Radio	15150as				
1430-1500 mtwhf	Portugal, Radio	21515me				
1430-1500	Romania, R Romania Intl	11775as	15335as	17720as		
1430-1500	Sweden, Radio	15240am	17870am			
1430-1500 vl	Uganda, Radio	4976do				
1435-1445	Greece, Voice of	15630na	17525as			
1445-1500 smha	Mongolia, R Ulaanbaatar	13780as				

SELECTED PROGRAMS

Sundays

1400 Christian Science Sentinel: Bible Lesson. See S 0100.
1411 Radio Moscow: Science and Engineering in the CIS. See S 0611.
1425 Radio Netherlands: Music Break. See S 0225.
1429 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
1432 Radio Moscow: Your Top Tune. See S 0332.
1435 Radio Netherlands: East of Edam. See S 0235.

Mondays

1400 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1411 Radio Moscow: Mailbag. See M 0611.
1425 Radio Netherlands: Music Break. See S 0225.
1432 Radio Moscow: Audio Book Club. See S 0132.
1437 Radio Netherlands: Newsline. See S 0037.
1445 BBC: Feature. "American Icons" (6th). See S 0445.
1451 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1452 Radio Netherlands: Let's Get to Business. See M 1252.

Tuesdays

1400 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1411 Radio Moscow: Newmarket. See S 0611.
1425 Radio Netherlands: Music Break. See S 0225.
1432 Radio Moscow: Music. See S 0632.
1437 Radio Netherlands: Newsline. See S 0037.
1445 BBC: Classical Music Feature. See M 0145.
1451 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1452 Radio Netherlands: Mirror Images. See T 1152.

Wednesdays

1400 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1411 Radio Moscow: Mailbag. See M 0611.
1411 Radio Moscow: Moscow Mailbag. See S 0111.
1425 Radio Netherlands: Music Break. See S 0225.
1432 Radio Moscow: Russian by Radio. See M 2332.
1437 Radio Netherlands: Newsline. See S 0037.
1451 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1452 Radio Netherlands: Encore! See W 0152.

Thursdays

1400 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1425 Radio Netherlands: Music Break. See S 0225.
1432 Radio Moscow: Audio Book Club. See S 0132.
1437 Radio Netherlands: Newsline. See S 0037.
1451 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1452 Radio Netherlands: Research File. See M 1152.

Fridays

1400 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1411 Radio Moscow: Mailbag. See M 0611.
1425 Radio Netherlands: Music Break. See S 0225.
1432 Radio Moscow: Russian by Radio. See M 2332.
1437 Radio Netherlands: Newsline. See S 0037.
1451 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1452 Radio Netherlands: Documentary. See W 1152.

Saturdays

1400 Christian Science Sentinel: Monitor Radio News. See M 2300.
1406 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
1411 Radio Moscow: Newmarket. See S 0611.
1425 Radio Netherlands: Music Break. See S 0225.
1432 Radio Moscow: Audio Book Club. See S 0132.
1437 Radio Netherlands: Newsline. See S 0037.
1452 Radio Netherlands: Bats; Balls & Baselines. See A 0252.

English language

shortwave guide

1500 UTC [10:00 AM EST/7:00 AM PST]

FREQUENCIES

1500-1600	Australia, ABC Brisbane	6140do			
1500-1600	Australia, Radio	5995pa	6060pa	6080as	7240pa
		7260as	9510as	9580pa	11660as
		11680as	11800pa		
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			
1500-1600	China, China Radio Intl	11815as	15165as		
1500-1600	Costa Rica, R Peace Intl	7375am	7385am	15030am	
1500-1600	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am
1500-1600	Ethiopia, Voice of	7165do	9560do		
1500-1550	Germany, Deutsche Welle	7185af	9735af	11965af	17765af
		21600af			
1500-1600	Guam, KTWR Agana	15610as			
1500-1600 vl	Italy, IRRS Milano	7125va			
1500-1600	Japan, NHK/Radio	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	7160do		
1500-1600	Malta, V of Mediterranean	11925eu			
1500-1513 smha	Mongolia, R Ulaanbaatar	13780as			
1500-1600	Netherlands, Radio	9895as	13700as	15150as	
1500-1600 ocasnal	New Zealand, R NZ Intl	9510pa			
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	5930as	6165as	7105as	7250as
		7260as	7345as	9705as	9755am
		9825am	9895na	11675me	11705me
		11875me	11940me	11965me	15125as
		15180as	15210am	15290as	15380am
		15465am	15550am	17760am	17790am
1500-1600 vl	Rwanda, Radiodiff Rwanda	9610do			
1500-1600	S Africa, Channel Africa	7270af	15240af		
1500-1600 vl	S Africa, Radio Oranje	4875do			
1500-1600 mtwhfs	Seychelles, FEBA Radio	9810as	15330as		
1500-1600	Singapore, SBC Radio One	5010do	5052do	11940do	
1500-1600	Sri Lanka, SLBC Colombo	6075as	9720as		
1500-1530	Switzerland, Swiss R Intl	13635af	15505af	17670af	21770af
1500-1600 vl	Uganda, Radio	4976do			
1500-1600	United Kingdom,BBC London	6190af	6195eu	7180as	9410eu
		9515na	9740me	9750eu	9760eu
		11750as	11940af	12095eu	15070af
		15260na	15420af	17640af	17705eu
		17840na	17880af	21470af	21490af
		21660af			
1500-1600	USA, KCBI Dallas TX	15725am			
1500-1600	USA, KTBN Salt Lk City UT	15590na			
1500-1600	USA, Monitor Radio Intl	9530as			
1500-1600	USA, VOA Washington DC	6110as	7125as	9690as	9700as
		9760as	15205af	15255eu	15395as
		19379as			
1500-1600	USA, WEWN Birmingham AL	9350am			
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	11830na	15215na	17760na	
1515-1600	Bulgaria, Radio	12085as			
1530-1600	Albania, R Tirana Intl	7155eu	9760eu		
1530-1600	Austria, R Austria Intl	6155eu	9880me	11780as	13730eu
1530-1545	Finland, YLE/Radio	6120eu	11755eu	11820eu	15240me
		21550af			
1530-1600	Georgia, Georgian Radio	11910eu			
1530-1600 vl	Russia, Radio Centre	15185eu			
1530-1600 irreg	Tanzania, Radio	11765af			
1530-1600	USA, VOA Washington DC	7215as			
1545-1600	Vatican State, Vatican R	11640as	15090au		

SELECTED PROGRAMS

Sundays

1500 Christian Science Sentinel: Bible Lesson. See S 0100.
1511 Radio Moscow: News and Views. See S 0011.
1525 Radio Netherlands: Dutch Press Review. Summary of items in the Dutch media.
1529 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
1532 Radio Moscow: Time Line. See S 0432.
1535 Radio Netherlands: Happy Station. See S 0137.

Mondays

1500 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1508 Radio Netherlands: CDutch. See M 1308.
1511 Radio Moscow: News and Views. See S 0011.
1515 BBC: Special Features. See M 0415.
1525 Radio Netherlands: Dutch Press Review. See S 1525.
1532 Radio Moscow: Folk Box. See M 0032.
1537 Radio Netherlands: Newsline. See S 0037.
1551 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1552 Radio Netherlands: Research File. See M 1152.

Tuesdays

1500 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1511 Radio Moscow: News and Views. See S 0011.
1525 Radio Netherlands: Dutch Press Review. See S 1525.
1532 Radio Moscow: Music. See S 0632.
1537 Radio Netherlands: Newsline. See S 0037.
1551 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1552 Radio Netherlands: No Boundaries. See T 0152.

Wednesdays

1500 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1511 Radio Moscow: News and Views. See S 0011.
1515 BBC: Special Feature. "Images of Britain"
1515 BBC: Special Feature. "Unconsidered Trifles" (29th). See M 0415.
1525 Radio Netherlands: Dutch Press Review. See S 1525.
1530 BBC: Feature. "The Voices of America" (8th,15th). Spotlight on various programs taken from American Public Radio.
1530 BBC: Special Feature. "Two Cheers for 1993" (29th). The Two Cheers team explore the funnier international events of 1993.
1530 BBC: Special Feature. "Two Cheers for November" (1st). An irreverent look at the events that made the headlines during last month.
1532 Radio Moscow: Music. See S 0632.
1537 Radio Netherlands: Newsline. See S 0037.
1551 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1552 Radio Netherlands: Documentary. See W 1152.

Thursdays

1500 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1511 Radio Moscow: News and Views. See S 0011.
1525 Radio Netherlands: Dutch Press Review. See S 1525.
1532 Radio Moscow: Yours for the Asking. See T 0032.
1537 Radio Netherlands: Newsline. See S 0037.
1551 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Fridays

1500 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1511 Radio Moscow: News and Views. See S 0011.
1525 Radio Netherlands: Dutch Press Review. See S 1525.
1532 Radio Moscow: Music at Your Request. See M 1232.
1537 Radio Netherlands: Newsline. See S 0037.
1551 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
1552 Radio Netherlands: Towards 2000. See F 1152.

Saturdays

1500 Christian Science Sentinel: Monitor Radio News. See M 2300.
1506 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
1511 Radio Moscow: News and Views. See S 0011.
1525 Radio Netherlands: EuroPress Review. See A 0125.
1537 Radio Netherlands: Newsline. See S 0037.
1552 Radio Netherlands: Sounds Interesting. See S 0052.

1600 UTC [11:00 AM EST/8:00 AM PST]

FREQUENCIES

1600-1700	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			
1600-1645	Bulgaria, Radio	12085as			
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	11575af	15110af	15130af	
1600-1700	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
1600-1630	Czech Republic, R Prague	6055eu	7345eu	11900af	13580af
		15505af			
1600-1700	Ecuador, HCJB Quito	21455am	21480am		
1600-1700	France, Radio France Intl	6175eu	11705af	12015af	15530me
		17620af	17795af	17850af	
1600-1650	Germany, Deutsche Welle	6170as	7225as	7305as	9585as
		9815as	11785as	15105as	
1600-1700	Guam, KSDA AWR Agat	7455as			
1600-1645	Guam, KTWR Agana	15610as			
1600-1700 vl	Italy, IRRS Milano	7125as			
1600-1630	Jordan, Radio	9560eu			
1600-1700 s	Lebanon, King of Hope	6280me			
1600-1615 mha	Mongolia, R Ulaanbaatar	7560as	7780as		
1600-1649 ocasnal	New Zealand, R NZ Intl	9510pa			
1600-1700	Nigeria, Radio	4990do			
1600-1700	Nigeria, Voice of	7255af			
1600-1700	Pakistan, Radio	11570me	13590me	15515af	15555me
		15675me	17725af		
1600-1700 vl	PNG, Natl BC	4890do			
1600-1700	Russia, Radio Moscow Intl	5930as	6165as	7105as	7180as
		7250as	7260as	7345as	9540eu
		9550eu	9825eu	9880eu	9895eu
		11705am	11875am	11940am	15125as
		15180na	15290na	15380na	15550af
		17760na	17790na		
1600-1700 vl	Rwanda, Radiodiff Rwanda	9610do			
1600-1700	S Africa, Channel Africa	7270af	15240af		
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, Radio Dubai	11795af	13675eu	15435eu	21605eu
1600-1700 vl	Uganda, Radio	4976do			
1600-1700	United Kingdom,BBC London	6190af	6195eu	7180as	9410eu
		9515na	9630af	9740me	9750eu
		9760eu	11750as	11940af	12095eu
		15070af	15260na	15420af	17640af
		17840na	17860af	17880af	21470af
		21660af			
1600-1700	USA, KCBI Dallas TX	15375am			
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, Monitor Radio Intl	13625af			
1600-1700	USA, VOA Washington DC	7125as	9645as	9700as	9760as
		11920af	11995af	13710af	15205af
		15225af	15395as	15445af	17885af
		17895af	19379af		
1600-1700	USA, WEWN Birmingham AL	13615am	17510am		
1600-1700	USA, WHRI Noblesville IN	9465na	15105na		
1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700	USA, WRNO New Orleans LA		15420na		
1600-1700	USA, WWCR Nashville TN	13845am	15610am	15685am	
1600-1700	USA, WYFR Okeechobee FL	11830na	15215na	17760na	21525af
		21615af			
1600-1630 a	Vatican State, Vatican R	11640af	15090af		
1600-1630	Vietnam, Voice of	9840af	12020af	15010af	
1600-1630	Yemen, Radio TV Corp	5970eu	7190eu		
1630-1700	Australia, Radio	6060pa	11880pa		
1630-1657	Canada, RCI Montreal	7150as	9550as		
1630-1700	Ecuador, HCJB Quito	17790me	21480me		
1630-1700	Egypt, Radio Cairo	15255af			
1645-1700 s	Guam, KTWR Agana	15610as			
1645-1700	Tajikistan, Radio	7245as			
1650-1700 mtwtf	New Zealand, R NZ Intl	9550pa			

SELECTED PROGRAMS

Sundays

1600 Christian Science Sentinel: Bible Lesson. See S 0100.
1611 Radio Moscow: Top Priority. See S 0511.
1615 BBC: Feature. See S 0230.
1629 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
1632 Radio Moscow: Contacts and Contracts. Commercial and business activities and developments.

Mondays

1600 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1632 Radio Moscow: Time Line. See S 0432.
1635 BBC: Special Feature. "Trees". The beauty and usefulness of trees and wood are explored.
1651 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Tuesdays

1600 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1611 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
1632 Radio Moscow: Interview. See S 0411.
1651 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Wednesdays

1600 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1611 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
1615 BBC: Music Feature. "Broadway Lights". The history of the broadway musical featuring Rodgers and Hammerstein (8th), Leonard Berstein (15th), and Stephen Sondheim (22th).
1632 Radio Moscow: Interview. See S 0411.
1639 Radio Moscow: Music. See S 0632.
1651 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Thursdays

1600 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.

1611 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
1632 Radio Moscow: Interview. See S 0411.
1639 Radio Moscow: Music. See S 0632.
1651 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Fridays

1600 Monitor Radio Int'l: Monitor Radio Early Edition. See M 1100.
1611 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
1632 Radio Moscow: Music. See S 0632.
1651 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.

Saturdays

1600 Christian Science Sentinel: Monitor Radio News. See M 2300.
1606 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
1611 Radio Moscow: Focus on Asia and the Pacific. See T 0111.
1615 BBC: Feature. "Lost in Space" (25th). NASA's Mars Observatory mission and other expensive technical disasters.
1632 Radio Moscow: Music. See S 0632.

English language

shortwave guide

1700 UTC [12:00 PM EST/9:00 AM PST]

1700-1800	Australia, Radio		5995pa	6060pa	6080as	7240pa
	7260as	9510as	9580pa	11680as	11695pa	11880pa
1700-1800 vl	Australia, VL8A Alice Spg		2310do			
1700-1800 vl	Australia, VL8K Katherine		2485do			
1700-1800 vl	Australia, VL8T Tent Crk		2325do			
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		9570af	11575af	15345af	
1700-1800	Costa Rica, R Peace Intl		7375am	7385am	15030am	21465am
1700-1800	Ecuador, HCJB Quito		15270me	17790me	21455me	21480na
1700-1800	Egypt, Radio Cairo		15255af			
1700-1730	Georgia, Georgian Radio		11760eu			
1700-1800 as	Guam, KSDA AWR Agat		13720as			
1700-1800 vl	Italy, IRRS Milano		7125eu			
1700-1800	Japan, NHK/Radio		9750as	11815as	11865na	17750me
1700-1730	Kazakhstan, R Alma Ata		15270eu			
1700-1800 s	Lebanon, King of Hope		6280me			
1700-1800 a	Morocco, RTV Marocaine		17815af			
1700-1800 mtwtf	New Zealand, R NZ Intl		9550pa			
1700-1750	North Korea, R Pyongyang		9325eu	9640af	9977af	13785af
1700-1800	Pakistan, Radio		11570eu	15550eu		
1700-1800 vl	PNG, Natl BC		4890do			
1700-1755	Poland, Polish R Warsaw		7270eu	9525eu		
1700-1800	Russia, Radio Moscow Intl		6165as	7105as	7170as	7180as
	7260as	7345as	9505am	9540am	9550am	11960af
	15180af	15385af	15395af	15425na	17760am	
1700-1800 vl	Rwanda, Radiodiff Rwanda		9610do			
1700-1800	S Africa, Channel Africa		7270af	15240af		
1700-1800 vl	S Africa, Radio Oranje		4875do			
1700-1800	Saudi Arabia, BSKSA		9705eu	9720eu		
1700-1715 vl	Somalia, R Free Somalia		7499do			
1700-1730	Sri Lanka, SLBC Colombo		6075as	9720as		
1700-1715	Swaziland, Trans World R		7120af			
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		6005af	9515na	12095eu	15260na
			17860af	21660af		
1700-1800	United Kingdom, BBC London		3955eu	6180eu	6190af	6195eu
	7160me	9410eu	9515eu	9630af	9740me	11940af
	12095af	15070af	15260af	15400af	15420af	17880af
	21470af	21660af				
1700-1800	USA, KCBI Dallas TX		15375am			
1700-1800	USA, KTBN Salt Lk City UT		15590am			
1700-1800	USA, Monitor Radio Intl		13625af			
1700-1800	USA, VOA Washington DC		6040eu	6110as	7125as	7215as
	9700as	9760eu	11920af	11995af	12040af	13710af
	15205eu	15255me	15395as	15445af	17895af	19379af
1700-1800	USA, WEWN Birmingham AL		13615am			
1700-1800	USA, WHRI Noblesville IN		13760am	15105am		
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	15610am	15685am	
1700-1800	USA, WYFR Okeechobee FL		21500af			
1715-1730 mtwhf	Swaziland, Trans World R		7120af			
1715-1730	Vatican State, Vatican R		6245eu	7250eu	9645eu	
1730-1800	Netherlands, Radio		6020af	9605af	21515af	21590af
1730-1800	Romania, R Romania Intl		15340af	15365af	17745af	17805af
1730-1800 vl	Sierra Leone, SLBS		3316do			
1730-1800	Vatican State, Vatican R		11625af	15090af	17730af	
1735-1745 th	Paraguay, Radio Nacional		6025sa	9735sa		
1745-1800	India, All India Radio		7412eu	9950me	11620eu	11860eu
			11935af	15080af		

1800 UTC [1:00 PM EST/10:00 AM PST]

1800-1900	Australia, Radio		5960as	5995pa	6060pa	6080as
	7240pa	7260as	9580pa	11695pa	11855as	11880pa
1800-1900 vl	Australia, VL8A Alice Spg		2310do			
1800-1900 vl	Australia, VL8T Tent Crk		2325do			
1800-1900	Bahrain, Radio		6010do			
1800-1900	Brazil, Radiobras		15265eu			
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 Peace Intl		7375am	7385am	15030am	21465am
1800-1827	Czech Republic, R Prague		6055eu	7345eu	9490eu	11990af
			13580af			
1800-1900	Ecuador, HCJB Quito		21455am			
1800-1830	Egypt, Radio Cairo		15255af			
1800-1815	Ghana, GBC Radio 1		4915do			
1800-1815	Ghana, GBC Radio 2		3316do			
1800-1900 as	Guam, KSDA AWR Agat		13720as			
1800-1900	India, All India Radio		7412eu	9950me	11620eu	11860eu
			11935af	15080af		
1800-1815	Israel, Kol Israel		7465eu	11588na		
1800-1900 vl	Italy, IRRS Milano		7125eu			
1800-1900	Kuwait, Radio		13620na			
1800-1900	Lebanon, King of Hope		6280me			
1800-1900	Netherlands, Radio		6020af	9605af	21515af	21590af
1800-1900 mtwtf	New Zealand, R NZ Intl		9550pa			
1800-1830 s	Norway, Radio Norway Intl		9590eu	11860af		
1800-1900 vl	PNG, Natl BC		4890do			
1800-1830 mtwhf	Portugal, Radio		9780eu			
1800-1900	Russia, Radio Moscow Intl		6165eu	7105eu	7180eu	7250eu
	7260eu	9550eu	9880eu	11685af	12050na	15290na
	15380af	15385af	15405as	15425as	17605na	17760af
	17790na	17875as				
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			
1800-1900	United Kingdom, BBC London		3255af	3955eu	6005af	6180eu
	6190af	6195eu	7160me	9410eu	9630af	9740me
	11940af	12095af	15070af	15400af	15420af	17880af
1800-1900	USA, KCBI Dallas TX		15725am			
1800-1900	USA, KJES Mesquite NM		9510na			
1800-1900	USA, KTBN Salt Lk City UT		15590am			
1800-1900	USA, Monitor Radio Intl		9355pa	21640af		
1800-1900	USA, VOA Washington DC		3980eu	6040eu	9700me	9760eu
	11920af	11995af	13710af	15205eu	15410eu	15580af
	17800af	17895af				
1800-1900	USA, WEWN Birmingham AL		13740am			
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	15610am	15685am	
1800-1830	Vietnam, Voice of		9840eu	12020eu	15010eu	
1815-1900	Bangladesh, Radio		9570me	12030eu		
1830-1900	Bulgaria, Radio		7455eu	9700eu		
1830-1855	Finland, YLE/Radio		6120eu	9730eu	11755eu	15440eu
1830-1857	Slovakia, R Slovakia Intl		5915eu	7345eu	9605eu	
1830-1900	Sri Lanka, SLBC Colombo		9720eu	15120eu		
1830-1900	Sweden, Radio		6065af	9655me	15145eu	
1830-1900	Switzerland, Swiss R Intl		6065eu	9655af	15270af	15505af
1840-1850 mtwhfa	Greece, Voice of		15630af	15650af	17525af	
1845-1900	Armenia, Radio Yerevan		9450na	11920na	11960na	
1845-1900 irreg s	Mali, Radio Malienne		4783do	4835do	5995do	
1850-1900 as	New Zealand, R NZ Intl		9550pa			

1900 UTC [2:00 PM EST/11:00 AM PST]

1900-2000	Algeria, Radio Algiers		9535eu	15205eu	17745eu	
1900-2000	Argentina, RAE		15345eu			
1900-2000	Australia, Radio		5960as	5995pa	6060pa	6080as
	7240pa	7260as	9580pa	11695pa	11720pa	11880pa
1900-2000 vl	Australia, VL8A Alice Spg		2310do			
1900-2000 vl	Australia, VL8K Katherine		2485do			
1900-2000 vl	Australia, VL8T Tent Crk		2325do			
1900-1915	Azerbaijan, Radio		4958do	15240do		
1900-2000	Bahrain, Radio		6010do			
1900-1925	Belgium, R Vlaanderen Int		5910eu	13685af		
1900-2000	Bulgaria, Radio		7455af	9700eu		

1900 UTC cont'd

1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	6955af	9440af		
1900-2000	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
1900-2000	Ecuador, HCJB Quito	17490eu	17790eu	21455eu	21480eu
1900-1950	Germany, Deutsche Welle	9640af	11740af	11785af	11810af
		13790af	15350af	15390af	17765af
1900-1910 mtwhfa	Greece, Voice of	7450eu	9380eu		
1900-1945	India, All India Radio	7412eu	9950me	11620eu	11860eu
		11935af	15080af		
1900-2000 vl	Italy, IRRS Milano	7125eu			
1900-2000	Japan, NHK/Radio	9640am	9750as	11815pa	11865pa
		11875pa			
1900-2000	Kuwait, Radio	13620na			
1900-2000	Lebanon, King of Hope	6280me			
1900-2000	Liberia, Radio ELWA	4760do			
1900-2000 s	Morocco, RTV Marocaine	11920as			
1900-2000	Netherlands, Radio	6020af	9605af	21515af	21590af
1900-2000 mtwtf	New Zealand, R NZ Intl	9550pa			
1900-2000 as	New Zealand, R NZ Intl	9550pa			
1900-2000	Nigeria, Radio	3326do	4990do		
1900-2000	Nigeria, Voice of	7255af			
1900-2000 vl	PNG, Natl BC	4890do			
1900-2000 vl	PNG, Radio Central	3290do			
1900-2000 vl	PNG, Radio Milne Bay	3365do			
1900-2000 vl	PNG, Radio Western	3305do			
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	7105af	7180af	7260af	9550af
	9640eu 9880af	11685eu	11760eu	11995eu	12050eu
	15130af 15150af	15180af	15425na	15580af	17560na
	17690na 17710na	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			
1900-2000	United Kingdom, BBC London	3255af	3955eu	6005af	6180eu
	6190af 6195eu	7160me	9410eu	9630af	9740me
	12095af 15070af	15400af	17880af	21640af	
1900-2000	USA, KCBI Dallas TX	15725am			
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000	USA, Monitor Radio Intl	9355eu	15665eu	21640af	
1900-2000	USA, VOA Washington DC	3980eu	6040eu	7415af	9525pa
	9700me 9760eu	11870pa	11920af	11995af	13710af
	15180pa 15205eu	15410af	15580af	17800af	17895af
	19379af				
1900-2000	USA, WEWN Birmingham AL	13740am	15695am		
1900-2000	USA, WHRI Noblesville IN	9590na	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	15610am	15685am	
1900-2000	USA, WYFR Okeechobee FL	15355af	21615af		
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1910-1920	Botswana, Radio	3356af	4830af	7255af	
1930-2000	Austria, R Austria Intl	5945eu	6155eu	13730af	
1930-2000	Georgia, Georgian Radio	9565me			
1930-2000	Iran, VOIRI Tehran	9022eu	15260eu		
1930-2000	Netherlands, Radio	17605af	21590af		
1930-2000	Poland, Polish R Warsaw	6135eu	7270eu	7285eu	9525eu
1930-1957	Slovakia, R Slovakia Intl	5915eu	7345eu	9440eu	
1940-2000 mha	Mongolia, R Ulaanbaatar	11790eu	11850eu		

2000 UTC [3:00 PM EST/12:00 PM PST]

2000-2100	Australia, Radio	5960as	6060pa	6080as	7240pa
	7260as 9580pa	11695pa	11720pa	11880pa	
2000-2100 vl	Australia, VL8A Alice Spg	2310do			
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2100	Bahrain, Radio	6010do			
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	9920eu	11500eu	11715af	15110af
2000-2100	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
2000-2100	Ecuador, HCJB Quito	21455am			
2000-2030	Ghana, GBC Radio 1	4915do			
2000-2030	Ghana, GBC Radio 2	3366do			
2000-2100	Indonesia, Voice of	9675me	11752eu		
2000-2030	Iran, VOIRI Tehran	9022eu	15260eu		
2000-2030	Israel, Kol Israel	7465eu	9435eu	11588na	11603na
		11675na	17575af		
2000-2100 vl	Italy, IRRS Milano	7125af			
2000-2010 mtwhf	Kenya, Kenya BC Corp	4935do			
2000-2100	Kuwait, Radio	13620na			
2000-2030 as	Latvia, Latvian Radio	5935eu			
2000-2100	Lebanon, King of Hope	6280me			
2000-2100	Liberia, Radio ELWA	4760do			
2000-2030	Lithuania, Radio Vilnius	9710am			
2000-2010 smwha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
2000-2025	Netherlands, Radio	17605af	21590af		
2000-2100	New Zealand, R NZ Intl	9550pa			
2000-2100	Nigeria, Radio	3326do	4990do		
2000-2100	Nigeria, Voice of	7255af			
2000-2100	North Korea, R Pyongyang	6576eu	9345eu	9640af	9977af
2000-2030 s	Norway, Radio Norway Intl	9590eu			
2000-2100 vl	PNG, Natl BC	4890do			
2000-2100 vl	PNG, Radio Central	3290do			
2000-2100 vl	PNG, Radio Enga	2410do			
2000-2100 vl	PNG, Radio Milne Bay	3365do			
2000-2100 vl	PNG, Radio Western	3305do			
2000-2100	Russia, Radio Moscow Intl	7180eu	7205eu	7250eu	7260eu
	7300eu 7335eu	7400eu	9550eu	9640eu	9815eu
	9820eu 9880eu	11550af	11675af	11685af	11730na
	11760na 11805af	11905na	12015na	12050na	13775af
	15340as 15385af	15425na	17605na	17690na	17710na
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 vl	Uganda, Radio	4976do			
2000-2030	United Kingdom, BBC London	6190af	6195eu	7160me	9630af
		9740me	15070af	17880af	
2000-2100	United Kingdom, BBC London	3255af	3955eu	4570af	5975am
	6005af 6180eu	7325eu	9410eu	15260sa	15400af
2000-2100	USA, KCBI Dallas TX	15725am			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100	USA, Monitor Radio Intl	13770af	15665eu		
2000-2030	USA, VOA Washington DC	11785af	15160af		
2000-2100	USA, VOA Washington DC	6040eu	7415af	9700me	9760eu
	13710af 15205eu	15400af	15580af	17800af	17895af
	19379af 21485af				
2000-2100	USA, WEWN Birmingham AL	13740am			
2000-2100	USA, WHRI Noblesville IN	17830af			
2000-2100	USA, WINB Red Lion PA	15295eu			
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	13845am	15610eu	15685am	
2000-2100	USA, WYFR Okeechobee FL	7355eu	15566eu	17750af	21525af
2000-2030	Vatican State, Vatican R	9645af	11625af	15090af	
2005-2100	Syria, Radio Damascus	12085na	15095na		
2010-2100 sa	Kenya, Kenya BC Corp	4935do			
2015-2045 s	Swaziland, Trans World R	3200af			
2025-2045	Italy, RAI Rome	7235me	9575me	11800me	
2030-2035	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2030-2100	Egypt, Radio Cairo	15375af			
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	Vietnam, Voice of	9840eu	12020eu	15010eu	
2045-2100	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	11880pa	15265pa	
2050-2100	Vatican State, Vatican R	5885eu	7250eu		

English language

shortwave guide

2100 UTC [4:00 PM EST/1:00 PM PST]

2100-2200	Australia, Radio	9645as	11720pa	11855as	
2100-2106	Bahrain, Radio	6010do			
2100-2200	Bulgaria, Radio	6085eu	9700eu		
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	China, China Radio Intl	9920eu	9920eu	11500eu	11715af
		15110af			
2100-2200	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
2100-2200	Cuba, Radio Havana Cuba	17760eu			
2100-2130	Czech Republic, R Prague	6055eu	7265eu	7345eu	9490eu
2100-2130	Ecuador, HCJB Quito	21455am			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2150	Germany, Deutsche Welle	9640af	9670as	9715as	9765as
	11785as 13690as	15135af	15350af	15360as	15425as
2100-2200	Honduras, R Copan Intl	15675am			
2100-2200	Hungary, Radio Budapest	6110eu	7220eu	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	7125af			
2100-2200	Japan, NHK/Radio	6035eu	9640eu	9750eu	11815au
		11925eu	15430af		
2100-2200	Lebanon, King of Hope	6280me			
2100-2200 mtwtf	Lebanon, Wings of Hope	11530me			
2100-2200	Liberia, Radio ELWA	4760do			
2100-2137	New Zealand, R NZ Intl	9550pa			
2100-2200	Nigeria, Radio	3326do	4990do		
2100-2200 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2100-2130 mtwhf	Portugal, Radio	15250af			
2100-2200	Romania, R Romania Intl	7195eu	7225eu	9690eu	9750eu
		11940eu			
2100-2200	Russia, Radio Galaxy	11880eu			
2100-2200	Russia, Radio Moscow Intl	6130eu	7150eu	7180eu	7300eu
	7400eu 9550eu	9620na	9750na	9820na	9880na
	11550na 11685na	11710na	11730na	11750na	11760af
	11805eu 11905af	12015af	12050af	13775na	15340na
	15385af 15425na	17605af	17655na	17690af	17720as
2100-2200 vl	S Africa, Radio Oranje	4875do			
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	Turkey, Voice of	9445eu	11895		
2100-2200	Ukraine, R Ukraine Intl	4825eu	6070eu	6090eu	7150eu
		7195eu	7240eu	9685eu	
2100-2200	United Kingdom,BBC London	3255af	3955eu	5975am	6005af
	6180eu 6195eu	7325eu	9410eu	9590na	12095na
	15260sa 15400na				
2100-2200	USA, KCBI Dallas TX	15725am			
2100-2200	USA, KTBN Salt Lk City UT	15590na			
2100-2200	USA, Monitor Radio Intl	7510eu	15665eu		
2100-2200	USA, VOA Washington DC	6040eu	7415af	9700me	9760eu
	11870pa 13710af	15185as	15205eu	15445af	15580af
	17735as 17800af	17895af	21485af		
2100-2200	USA, WEWN Birmingham AL	13740am			
2100-2200	USA, WHRI Noblesville IN	13760am			
2100-2200	USA, WINB Red Lion PA	15185eu			
2100-2200	USA, WJCR Upton KY	7490na	13595na		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRNO New Orleans LA		15420na		
2100-2200	USA, WWCR Nashville TN	13845am	15610am		
2100-2200	USA, WYFR Okeechobee FL	7355eu	15566eu	17750af	21525af
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	6110am	15390am	17715am	
2130-2200	Australia, Radio	15240pa	15320pa	15365pa	17795pa
		21740pa			
2130-2200	Canada, RCI Montreal	5995eu	7260eu	11945eu	13650eu
	13690af 15140af	15270af	15325af	17820af	
2130-2200	Ecuador, HCJB Quito	17490am	17790eu	21455am	
2130-2200	Finland, YLE/Radio	6120eu	11755eu	15440eu	
2130-2140 mtwhf	Latvia, Latvian Radio	5935eu			
2130-2200	Sweden, Radio	6065af	9655eu		
2138-2200	New Zealand, R NZ Intl	15120pa			
2140-2200 s	Eqt Guinea, Radio Africa	7190af			
2145-2200	Armenia, Radio Yerevan	9450na	11920na	11960na	
2145-2200	South Korea, Radio Korea	6480eu	15575eu		

2200 UTC [5:00 PM EST/2:00 PM PST]

2200-2300	Australia, Radio	9645as	11720pa	11855as	15240pa
		15320pa	15365pa	17795pa	21740pa
2200-2225	Belgium, R Vlaanderen Int	5910eu			
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	5995eu	7260eu	11705eu	11945eu
	13650eu 13690eu	15140af	15325af	17820af	
2200-2300	China, China Radio Intl	9880eu			
2200-2230	China, China Radio Intl	3985eu			
2200-2220 s	Congo, R Natl Congolaise	4765do	5985do		
2200-2300	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
2200-2300	Cuba, Radio Havana Cuba	6180na			
2200-2230	Czech Republic, R Prague	6055eu	7265eu	7345eu	9490eu
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2258 s	Eqt Guinea, Radio Africa	7190af			
2200-2245	Finland, YLE/Radio	9730eu	11740eu	11810eu	
2200-2230 mtwhfa	Honduras, R Copan Intl	15675am			
2200-2230	India, All India Radio	7412eu	9910au	9950eu	11620eu
		11715pa	15265eu		
2200-2230 vl	Italy, IRRS Milano	7125af			
2200-2225	Italy, RAI Rome	9710as	11800as	15330as	
2200-2300	Lebanon, King of Hope	6280me			
2200-2300 mtwtf	Lebanon, Wings of Hope	11530me			
2200-2300	Liberia, Radio ELWA	4760do			
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	7150eu	7180eu	7305eu	7335eu
	9480af 9550eu	9620eu	9620eu	9750eu	9815eu
	9820eu 11550na	11685af	11705na	11750na	11835af
	11905af 11950af	12015na	12050af	13775na	15425na
	17570na 17605na	17655na	17665na	17690na	
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	9850eu	11915eu		
2200-2300	UAE, Radio Abu Dhabi	9770na	11710na	13605na	
2200-2300	Ukraine, R Ukraine Intl	4825eu	5960eu	6010eu	6020eu
	6055eu 7195eu	7240eu	9505eu	9685eu	9745eu
	9860eu				
2200-2300	United Kingdom,BBC London	3955eu	5975am	6195eu	7325eu
	9410eu 9590na	9915am	11750sa	15260sa	15400af
2200-2300	USA, KCBI Dallas TX	15725am			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, Monitor Radio Intl	9430as	9465na	13625as	17555sa
2200-2300	USA, VOA Washington DC	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	15610am		
2200-2300	USA, WYFR Okeechobee FL	17750eu	21525af		
2200-2230 s	USA,KGEI San Francisco CA	15280sa			
2203-2209	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2230-2300	Israel, Kol Israel	7465eu	9435eu	11587na	11603na
		11675na	15640na	15650na	17575sa
2230-2300	Libya, Radio Jamahiriya	7245eu			
2230-2300	Lithuania, Radio Vilnius	9710eu			
2230-2300	Sweden, Radio	6065eu			
2240-2300	Armenia, Radio Yerevan	11920na	11945na	15385na	
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	Bulgaria, Radio	7455eu	9700na		
2245-2300	Ghana, GBC Radio 1	4915do			
2245-2300	Ghana, GBC Radio 2	3366do			
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	9600au	11830as		

English language

shortwave guide

2300 UTC [6:00 PM EST/3:00 PM PST]

FREQUENCIES

2300-2315	Albania, R Tirana Intl	9760eu	11825eu		
2300-2400	Australia, Radio	11720pa	11855as	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			
2300-2400	Bulgaria, Radio	7455eu	9700na		
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			
2300-2330	Canada, RCI Montreal	5960na	5995eu	7250eu	9535eu
		9755eu	11845eu	11940eu	
2300-2400	Costa Rica, AWR Alajuela	5030ca	9725ca	11870ca	
2300-2400	Costa Rica, R Peace Intl	7375am	7385am	15030am	21465am
2300-2400	Ecuador, HCJB Quito	9745am	21455am		
2300-2315 a	Eqt Guinea, Radio Africa	7203af			
2300-2400	Guam, KSDA AWR Agat	15610as			
2300-2400	India, All India Radio	9910as	11745as	11785as	15110as
		15145as			
2300-2400	Japan, NHK/Radio	6060eu	6125eu	7140eu	15430as
		17810as			
2300-2400	Lebanon, King of Hope	6280me			
2300-2400 mtwhf	Lebanon, Wings of Hope	11530me			
2300-2400	Libya, Radio Jamahiriya	7245eu			
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	6120na			
2300-2400 mtwhfa	Palau, KHBN Voice of Hope	11980as			
2300-2400 vl	PNG, Natl BC	4890do			
2300-2400	Russia, Radio Moscow Intl	7150eu	7180eu	7305eu	7335eu
		9550eu	9620eu	9750na	9815eu
		9860na	11835na	12015na	12050na
		13775na	15425na	15470as	17570as
		17665na	17675as	21480as	
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		
2300-2400	Turkey, Voice of	7185me	9445na	11895eu	
2300-2400	UAE, Radio Abu Dhabi	9770na	11710na	13605na	
2300-2400	United Kingdom,BBC London	3955eu	5975na	6175na	6195na
		7180eu	7325na	9410eu	9590na
		9915am	11750sa	15260sa	15370af
		15400af			
2300-2400	USA, KCBI Dallas TX	13740am			
2300-2400	USA, KTBN Salt Lk City UT	15590na			
2300-2400	USA, Monitor Radio Intl	9430as	9465na	13625as	17555sa
2300-2400	USA, VOA Washington DC	7215as	9650as	9770as	11760as
		11820as	15185as	15290as	15305as
		17735as	17820as		
2300-2400	USA, WEWN Birmingham AL	7425am			
2300-2400	USA, WJCR Upton KY	7490na	13595na		
2300-2400	USA, WRNO New Orleans LA		7355na		
2300-2400	USA, WWCR Nashville TN	13845am	15610am		
2300-2315	Vatican State, Vatican R	9600au	11830as		
2330-2400	Austria, R Austria Intl	9870sa	13730sa		
2330-2400 a	Colombia, Radio Nacional	11822am	17865am		
2330-2400	Netherlands, Radio	6020na	6165na		
2330-2400 m	Sri Lanka, SLBC Colombo	15425am			
2330-2400	Sweden, Radio	11910eu			
2330-2400	Thailand, Radio	4830eu	9655as	11905as	
2330-2400	Vietnam, Voice of	9840as	12020as	15010as	
2335-2345 smtwhf	Greece, Voice of	9425sa	11595sa	11645sa	
2345-2355	Armenia, Radio Yerevan	9685na	11920na	12010na	

SELECTED PROGRAMS

Sundays

2300 Christian Science Sentinel: Sunday from The Mother Church. From the First Church of Christ, Scientist, in Boston, MA, USA.
2332 Radio Moscow: Audio Book Club. See S 0132.
2337 Radio Netherlands (na): East of Edam. Lively mixture of off-beat interviews, music, and a touch of humor.

Mondays

2300 Monitor Radio Int'l: Monitor Radio News. Five minutes of the latest world news at the beginning of the hour.
2306 Monitor Radio Int'l: Monitor Radio Int'l. News, analysis, commentary, interviews and features in a magazine format.
2311 Radio Moscow: Commonwealth Update. Commonwealth of Independent States (CIS) developments.
2332 Radio Moscow: Russian by Radio. A course in the Russian language.
2337 Radio Netherlands (na): Newsline. See S 0037.
2344 Monitor Radio Int'l: Letterbox. Listeners make their views known by telephone or letter.
2351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
2352 Radio Netherlands (na): Let's Get to Business. Down-to-earth program of trade and business with Barry O'Dwyer.

Tuesdays

2300 Monitor Radio Int'l: Monitor Radio News. See M 2300.
2306 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
2311 Radio Moscow: Commonwealth Update. See M 2311.
2332 Radio Moscow: Audio Book Club. See S 0132.
2337 Radio Netherlands (na): Newsline. See S 0037.
2344 Monitor Radio Int'l: Letterbox. See M 2344.
2351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
2353 Radio Netherlands (na): No Boundaries. Weekly focus on development issues.

Wednesdays

2300 Monitor Radio Int'l: Monitor Radio News. See M 2300.
2306 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
2311 Radio Moscow: Commonwealth Update. See M 2311.
2332 Radio Moscow: Russian by Radio. See M 2332.
2337 Radio Netherlands (na): Newsline. See S 0037.
2344 Monitor Radio Int'l: Letterbox. See M 2344.
2351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
2352 Radio Netherlands (na): Encore!. Reruns of the best programs from earlier seasons.

Thursdays

2300 Monitor Radio Int'l: Monitor Radio News. See M 2300.
2306 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
2311 Radio Moscow: Commonwealth Update. See M 2311.
2330 Radio Moscow: Audio Book Club. See S 0132.
2337 Radio Netherlands (na): Newsline. See S 0037.
2344 Monitor Radio Int'l: Letterbox. See M 2344.
2351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
2352 Radio Netherlands (na): Research File. See T 0052.

Fridays

2300 Monitor Radio Int'l: Monitor Radio News. See M 2300.
2306 Monitor Radio Int'l: Monitor Radio Int'l. See M 2306.
2332 Radio Moscow: Time Line. See S 0432.
2337 Radio Netherlands (na): Newsline. See S 0037.
2344 Monitor Radio Int'l: Letterbox. See M 2344.
2351 Monitor Radio Int'l: Religious Article from the CSM. See M 1151.
2353 Radio Netherlands (na): Documentary. See H 0052.

Saturdays

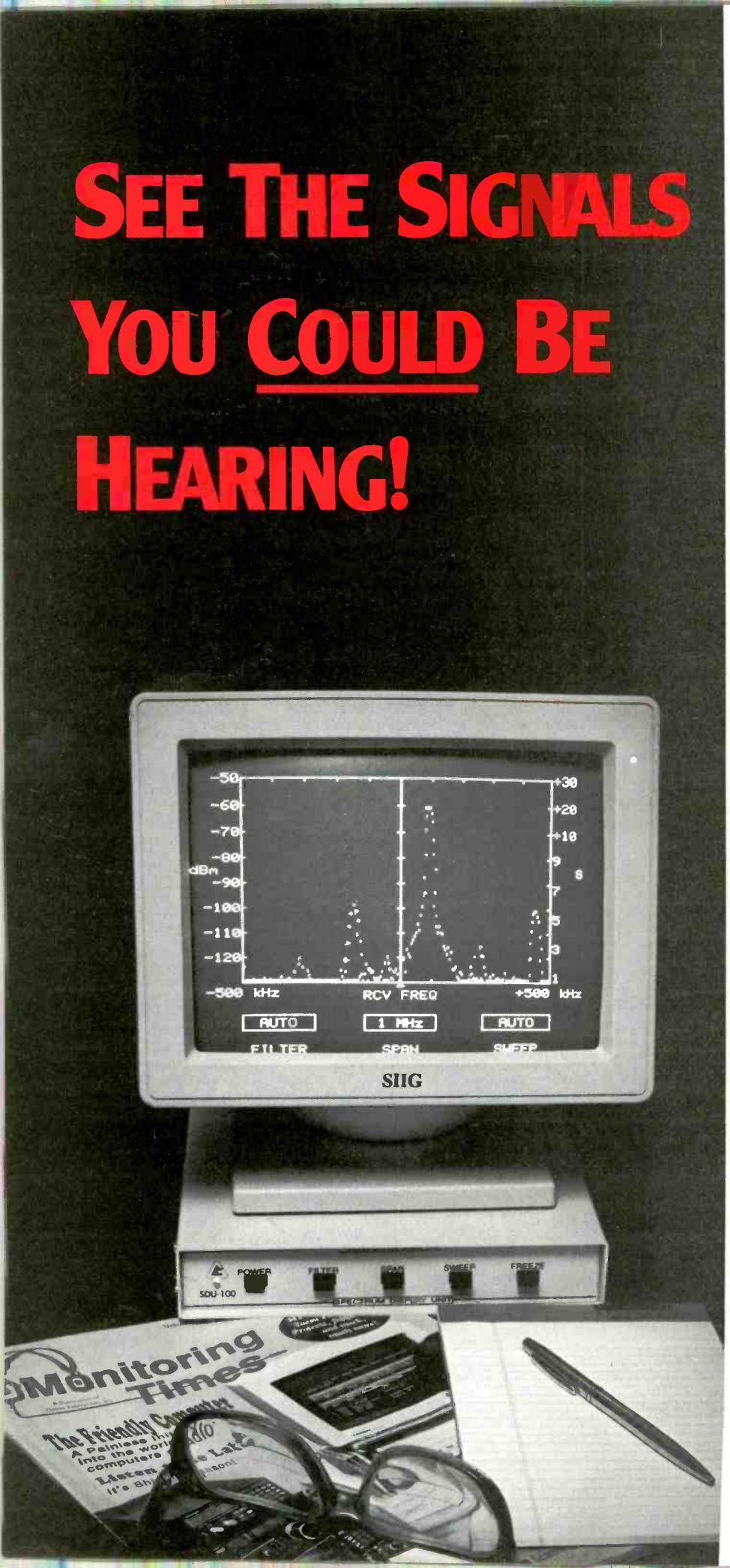
2300 Christian Science Sentinel: Monitor Radio News. See M 2300.
2306 Christian Science Sentinel: Christian Science Sentinel Radio Edition. See S 0129.
2311 Radio Moscow: Top Priority. See S 0511.
2337 Radio Netherlands (na): Newsline. See S 0037.
2353 Radio Netherlands (na): Bats; Balls & Baselines. See S 0000.

Thank You

Additional contributors to this month's Shortwave Guide:

Bob Fraser, Cohasset, MA; Clyde Harmon, Annison, AL; Gigi Lytle, Lubbock, TX; Larry Van Horn, Brasstown, NC; Bob Thomas, Bridgeport, CT; NASWA Journal, Speedx, BBC Summary of World Broadcasters, Internet, Grove BBS.

SEE THE SIGNALS YOU COULD BE HEARING!



Put professional power in your radio monitoring with the surveillance technology the pros use! Now you can *see* hidden radio signals with Grove Enterprises' new SDU-100 Spectrum Display Unit.

The SDU-100 attaches to the IF output jack on the back of your receiver, and it shows you all the signals in a slice of the radio spectrum you select — from 100 kHz up to 10 megahertz wide. Each signal appears as a "spike" on the display (the higher the spike, the stronger the signal).

Use Your Eyes to Spot Hidden Signals

Just the way surveillance countermeasures teams do, you'll be able to use both your ears and eyes in hunting new signals. With the power of spectrum display technology, you'll be able to track down elusive signals faster and more efficiently.

While you can listen to only one signal at a time, the SDU-100 can show you a whole band of signals at once. So, if you are listening to a particular transmission and suddenly a new spike appears on the monitor, you'll know immediately that there's a new signal to be checked out. Without the power of the SDU-100, those momentary transmissions would go undetected.

The Grove SDU-100 Spectrum Display Unit, and a nine-inch video monitor — the same spectrum surveillance technology that the pros use — costs just $599.95. For a limited time, you can purchase the SDU-100 in combination with a compatible receiver from Grove, and you'll save $50!

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- **Yaesu FT1000, FRG-100***
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- **Drake R8*, TR-7***
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- **Uniden BC890XLT***
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Simple installation: Unit goes between your receiver speaker output and your external speaker.
Power required: 11 to 16 VDC @ 500 ma.

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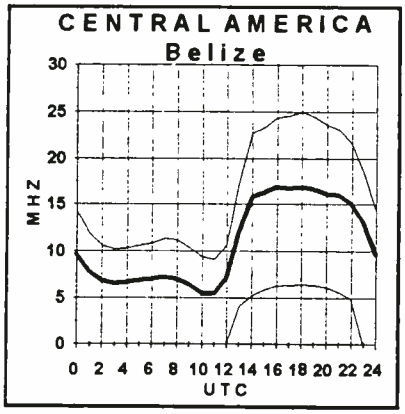
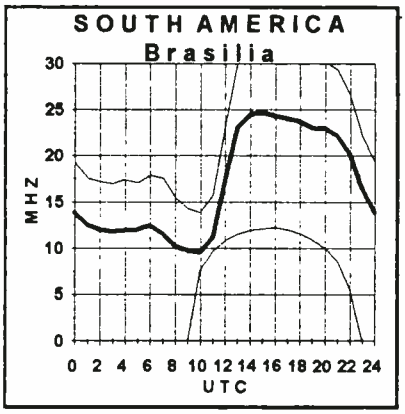
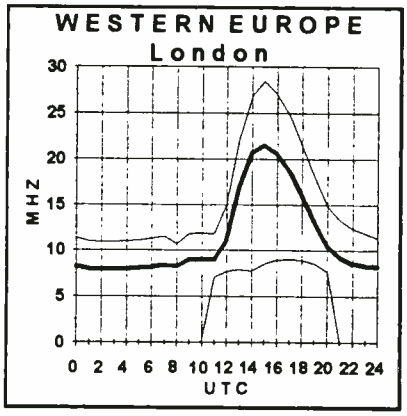
Propagation conditions: Eastern United States

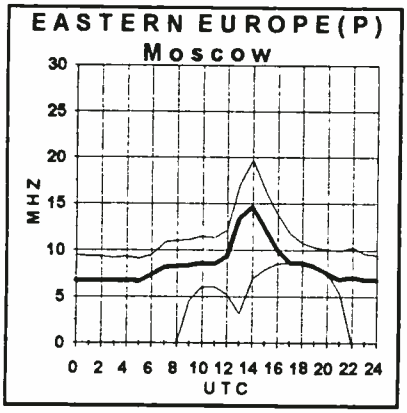
How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.

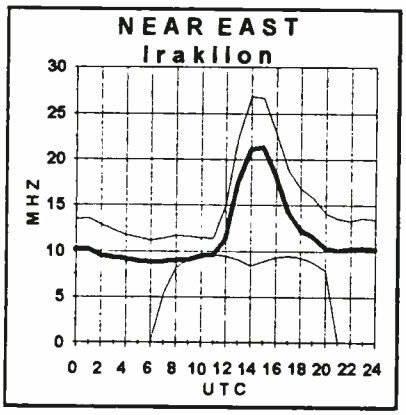
Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows

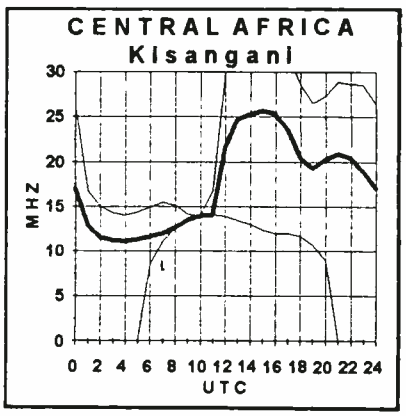


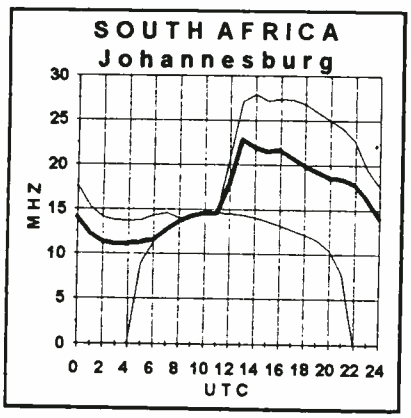


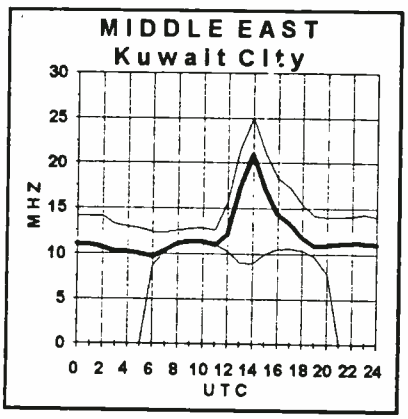


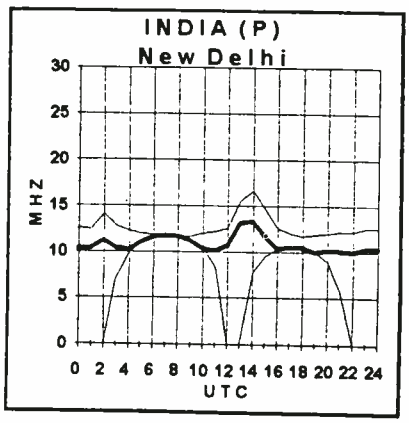


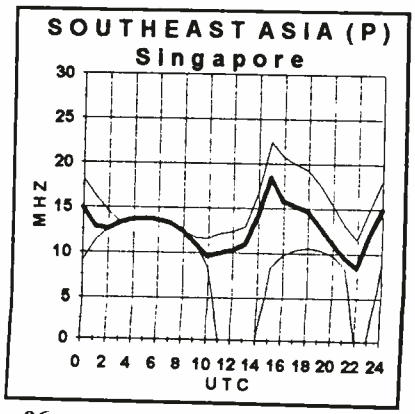


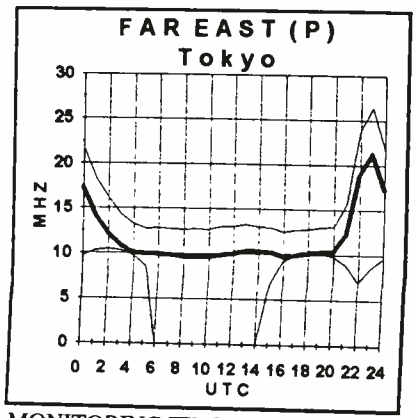


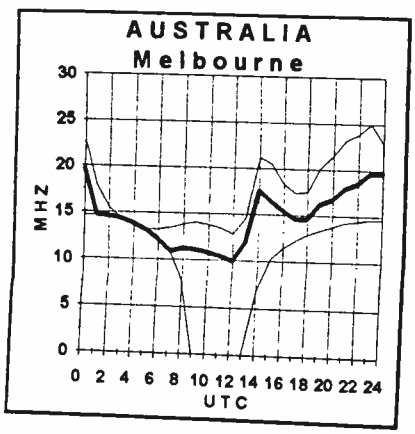






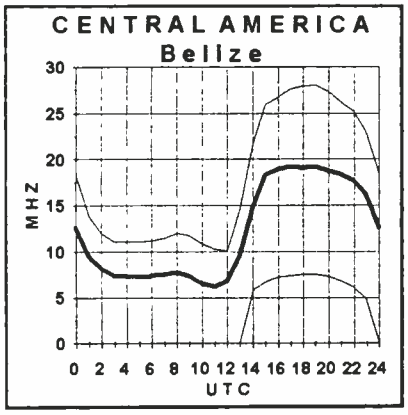


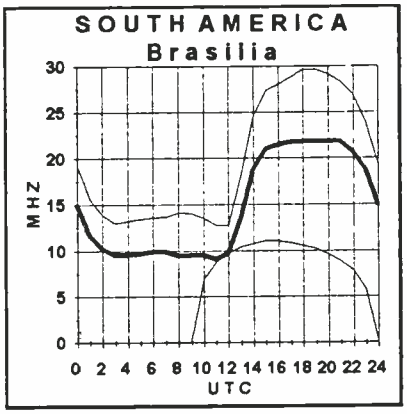


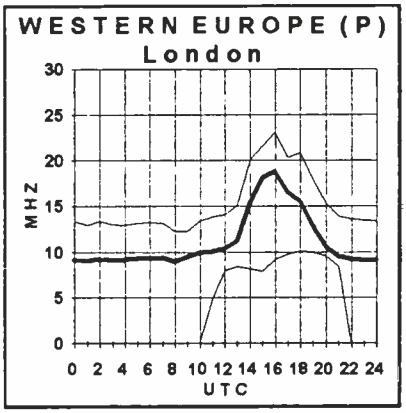


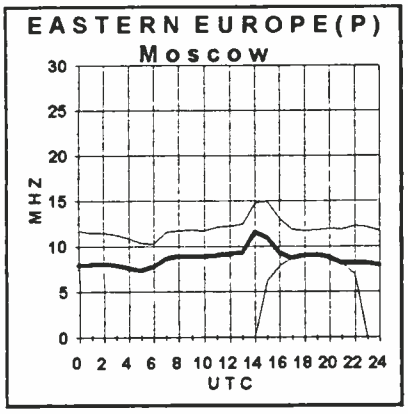
Propagation Conditions: Western United States

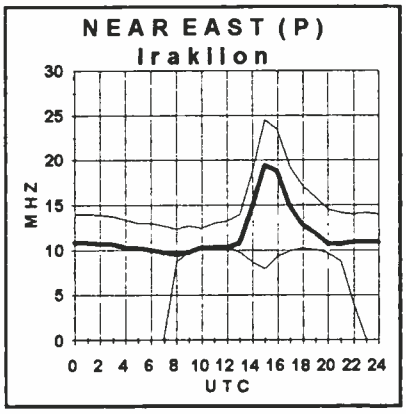
the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral 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.

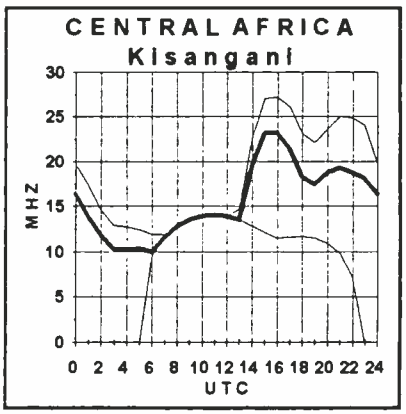


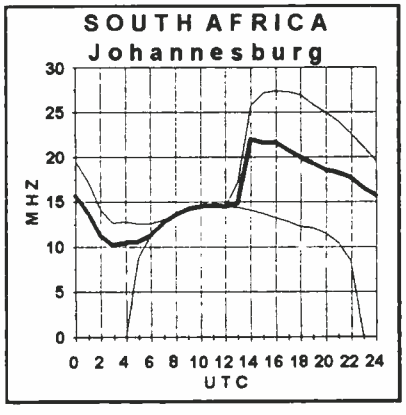


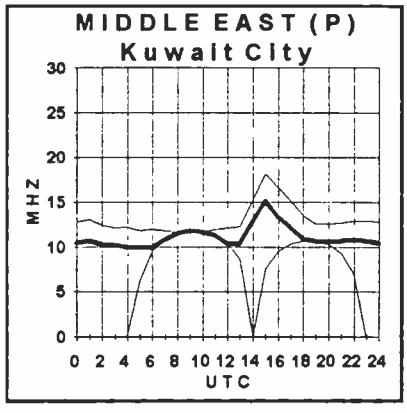


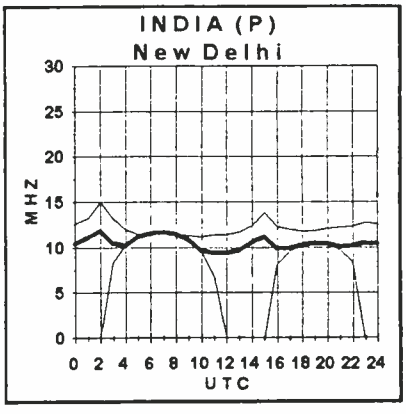


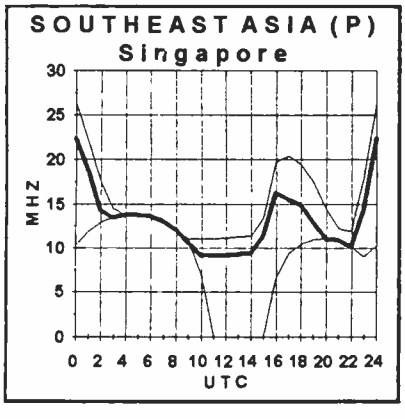


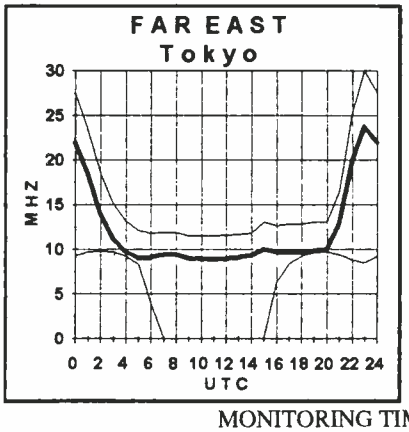


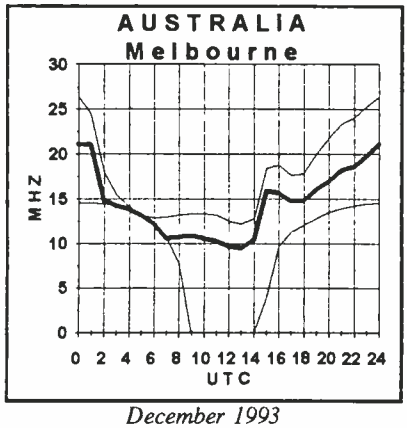






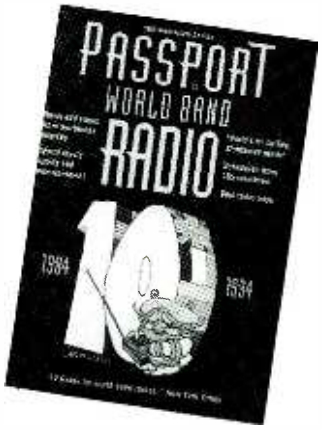






what's new?

Larry Miller



Passport to World Band Radio

It's hard to believe, but it's been ten years since *Passport to World Band Radio* first appeared on the scene. Of course back then it was called "Radio Database International" and it didn't look a whole lot like today's fat and handsome effort.

Over the years, *Passport* has continued to grow, sometimes in leaps, other times more subtly. This year, *Passport* truly hits its stride. The book is thick with information and packed with articles, addresses and frequencies.

QSLers and souvenir collectors will enjoy the expanded address section; the frequency area is meticulously crafted, as usual, by Tony Jones. The equipment reviews are splendid examples of Larry Magne's long-acclaimed no-holds barred style.

It goes without saying that we heartily recommend the new 10th anniversary *1994 Passport*. It's the world's best selling shortwave book—and no wonder.

Passport is available from Grove Enterprises and other *MT* advertisers. Be sure to tell 'em you saw it in *Monitoring Times*!

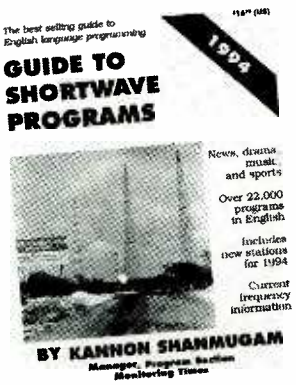
Programming Guide

Kannon Shanmugam, for five years the program manager for *MT's* Shortwave Guide section, has come out with his all-new 1994 edition of the *Guide to Shortwave Programs*, featuring over 22,000 programs in the English language.

Arranged by month, day of the week and time, the *Guide* allows you to choose an English language program in an instant. Station name and program title are right at your fingertips. Recommended frequencies for each broadcaster are provided in the front of the book.

Although the programming concentrates on peak listening hours in North America, you will find programming listed for the full 24 hours. Even with this limitation, the *Guide* is indispensable. The programming tips featured each month in *MT's* shortwave guide are only the tip of the iceberg compared to the full database.

The *1994 Guide to Shortwave Programs* is $16.95 plus $5 shipping from publisher Grove Enterprises.



Drake SW8 Unveiled

Drake's newest receiver was displayed for the first time at the *Monitoring Times* convention—the SW-8 is a desktop portable with shortwave, mediumwave, VHF aircraft and FM broadcast reception.

Not only continuous coverage 500 kHz-30 MHz, but 87-108 MHz FM broadcast (stereo at headphone jack) and 116-136 MHz aircraft bands are covered by the SW8. Other features include: standard and synchronous detection AM, upper and lower sideband on medium and short wave, direct frequency entry keypad, 0.5 microvolt sensitivity, dual 6/4 kHz selectivity on AM, sharp 2.3 kHz selectivity on SSB. Up-conversion eliminates images while +10 dBm intercept point suppresses intermod.

A compact 11" wide by 5-1/4" high and weighing a scant 10 pounds, the SW8 runs on optional internal batteries or its supplied AC adaptor. High-contrast, backlit LCD display provides 100 Hz tuning accuracy. Dual-mode clock timer and 70 scannable memories round out the key features of this welcome receiver!

Price had not yet been firmly set at press time, but it is expected to be under $700.

Two More Receiver Entries

Within a period of a month, three new receivers (including the Drake SW8) have been announced to the listening community. The most ambitious of these is the Watkins Johnson HF1000.

Watkins Johnson is well known to government agencies as the leading U.S. manufacturer of communications receivers for the federal and military services. A premium receiver at a premium price (under $4000), the new HF1000 features digital signal processing (DSP) technology.

Coverage is 5 kHz to 30 MHz, with superior IF digital filtering, multimode reception, RS-232 or CSMA remote control, and more.

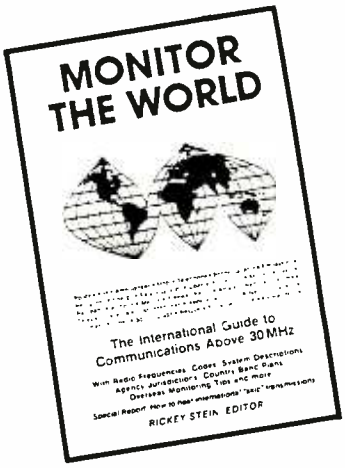
Also more sophisticated than the Drake is the AOR AR3030 general coverage receiver, which boasts a number of advanced features at a price expected to be below $900. This highly sensitive, professional quality receiver has 50 kHz-30 MHz continuous frequency coverage, multimode reception including synchronous AM detection, dual VFOs, RS232 interface, 100 programmable memories.

Further information on all three receivers will be available from Grove Enterprises, 1-800-438-8155.

Worldwide Scanning

Scanner listeners planning to do any world traveling—or who need a hand with some skip DXing—might want to pick up a copy of Rickey Stein's *Monitor the World*. According to the publisher, some 30-plus countries are listed.

But don't be misled. Some countries that are touted on the back cover contain no frequency information to speak of. The listing for China, for example, reports only that a 1987 edition of a Chinese magazine "showed some two way radios purported to be in everyday use." Under "Malta," the editor says that "it is not known if [these 14 frequencies]...originated from Malta." The 16 frequencies under



"Libya" are said to be for the "Libyan Air Defense Command."

Other more obvious countries have more fruitful lists, overflowing with information. Australia, Germany, Ireland and Mexico, for example, are hot, as is the United Kingdom.

The book also features a reprint of a *Monitoring Times* article by Brian Webb on DXing VHF Low Band Skip. Another section gives suggestions on how to get your scanner through customs in a foreign country. Ideas like, "A smile always goes a long way..." are wonderful. The idea of programming your scanner with local amateur radio frequencies in case the customs man turns on the radio leaves you open to the possibility that a local ham may be talking about the overthrow of the government. (Can you say, "Turkish prison?" I knew you could.) My favorite is that "one can always try to make the argument that [your scanner] is a cellular phone..." Hey, if the customs man doesn't speak English it's probably because he's stupid, right?

Monitor the World is a fun book, a work in progress, that you're sure to enjoy. It's available from various radio booksellers for $24.95 plus shipping, or write SMB Publishing, Box 428-MT, Newton Highlands, MA 02161.

The New Frontier

The problem with predicting the future is that it always comes back to haunt you. I remember well the very vocal Voice of America bureaucrat who ran around in the 1980s telling everyone that shortwave would be dead by 1990. Despite this, I am ready to make a prediction.

Having just read Tom Harrington's *Tune to Satellite Radio On your Satellite System,* I am prepared to announce the opening of the monitoring hobby's "new frontier." Harrington's book outlines a wide variety of audio services you can monitor if properly equipped. (And therein lies my only caveat to the prediction. Prices of equipment will have to come down considerably before this gets to be like scanning and shortwave listening.)

Harrington's book is responsible for this exciting prediction. Covered within is an incredible range of programming, from music and talk to all-news, business, weather and sports. A few examples of the juicy fare include Alaska Public Radio, classical music from New York's WQXR and the 24-hour CNN radio network. Then there's Deutsche Welle, Radio Iran, the Tropical Radio Service, and more.

Maybe you like sports. There's the Oilers Radio Network and Montreal Expos Radio, among others. Then there's the stuff I can only begin to guess at: The Saturn Network, Oz Radio. It's enough to make an old DXer cry with joy. If not yet convinced, turn to p. 50 for Ken Reitz' analysis of this work.

Be on the cutting edge. Check out Harrington's *Tune to Satellite Radion On Your Satellite System.* It's $16.95 plus $3 shipping from Universal Electronics, 4555 Groves Road, Suite 13-MT, Columbus, Ohio 43232; or call 614-866-4605.

NRC Logbook

The National Radio Club has sent notice that they are now shipping the 14th edition of their popular *AM Radio Log*. No book was available at the time we received the press release. We are told, however, that the log runs over 350 pages and contains

entries for all AM stations in the United States and Canada. There are three cross reference sections—by-state, by-city, and by-callsign. The main body of the *Log* is by-frequency. It's 8-1/2 x 11 inches and pre-punched for a three-ring binder.

This is an indispensable book for AM DXers and well worth its $19.95 (postpaid) price. To get yours, send a check or money order to NRC, P.O. Box 164, Mannsville, NY 13661.

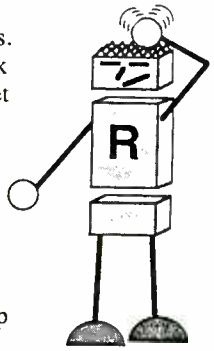
PC compatible FC

It seems that there's no end to the number of variations available to the manufacturers of frequency counters. Optoelectronics is now offering a unit that it says is a "substantial leap forward in features and capabilities."

While there are many new features on the M1, the most interesting is the fact that is has an asynchronous serial data port. The TTL data can be shifted to RS-232C using the optional CX12 interface (which includes data logging software) and used with any personal computer to data log and time stamp frequencies. In short, the M1 can be set up with a notebook or portable PC to log new frequencies.

The M1 is a full-range counter that comes with installed NiCad batteries, a wall plug power supply/charger and an owner's manual. Suggested retail price is $229.00. For more information, contact Optoelectronics, Inc., 5821 NE 14th Ave., Dept. MT, Ft. Lauderdale, Florida 33334; phone 1-800-327-5912.

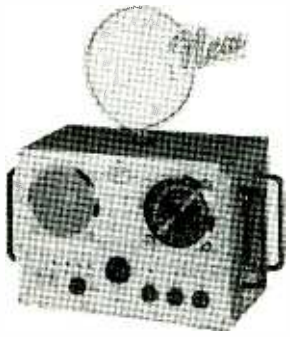
Meet the Phoneticos



Here it is. Another book on how to get your novice and no-code ham license. This one promises to "teach you lots of stuff" using desktop publishing cartoons. The cartoons are called *The Phoneticos*. Each of *The Phoneticos* is named after a letter. One Phonetico is called, for example, "R." "R," as you can see from the accompanying illustration, is made up of a short block (dit) and long block (dah) and a short block (dit). The publisher says that readers "will have fun with every page of this book."

We are sorry to report that we did not have fun and we did not get our license. This is through no fault of *The Phoneticos*, but rather the publisher, who failed to send us a copy of the book for review.

Look for *The Phoneticos* on their own Saturday morning ABC-TV kids show (*not!*) or pick up a copy of the book for $14.95 from Artsci Inc., P.O. Box 1428-MT, Burbank, California 91507; phone 818-843-4080.



Faux Vintage

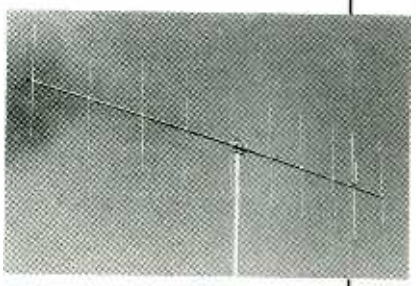
Paul Casey of Ontario sends along a catalog clipping for an authentic looking replica of a 1930s vintage field radio. It's a 5 band radio/cassette player housed in a wood cabinet with matte black finish and an engine turned, aluminum face plate. We can't vouch for performance—don't expect this one to compete with your hi-powered DX rigs—but it does look nice in the catalog Paul sent us. Called the "Field Radio," it's sold by the Eastwood Company for $84.95. Eastwood's address is 580 Lancaster Avenue, Box 3014-MT, Malvern, PA 19355-0714.

Communications Headsets

Azden has announced the arrival of new headsets. These might be of interest to scanner listeners since they have a shaped audio frequency response (200-5000 Hz with a 6 dB rise at 2400 Hz) specifically designed for voice communications.

Padded earpieces cover the ears so that outside sounds are reduced but not eliminated. (You'll still be able, for example, to hear your wife yelling at you to turn off the radios and take out the trash.) Low frequency noise such as hiss and static are significantly reduced—a feature of value to the shortwave DXer as well.

The weight is 6 oz; impedance is 20 ohms. The plug will probably require an adapter. The DM-10 is available direct from the manufacturer for $49.95. The address: 147 New Hyde Park Road, Franklin Square, New York 11010. Be sure to mention *MT* when placing your order. Note: photo shows professional model with boom mike, not included on DM-10.



Two Meter Yagi

Cushcraft has announced the arrival of their new A148-3S Two Meter Yagi. This is Cushcraft's newest addition to their popular FM Yagi line. The A148-3S offers a 7.5dB gain over the full 2 meter band. The manufacturer says it's perfect for packet, mountain topping or as a dedicated link antenna. It comes complete with all stainless steel hardware.

The A148-3S is available through your favorite ham radio dealer.

It's the Maine Scanner Directory

Another in Bob Coburn's excellent series of New England frequency directories is out. The all new, completely revised 5th edition of the *Official Maine Scanner Guide* is now available for $21.95 plus shipping. This edition has some 13,000 listings—up 3,600 from the last.

There's a complete update of all public safety licenses in the state including PL tones and channel numbers. Included are the new state correctional system, forestry repeaters, department of transportation frequencies and new county repeater systems.

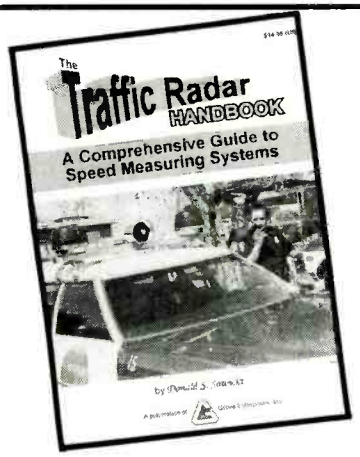
We've checked the accuracy of this one personally and give it "two thumbs up." It's excellent work.

Get your copy from Official Scanner Guide, P.O. Box 712-MT, Londonderry, New Hampshire 03053.

Exporting Databases

ProXport is a DOS-based program to help transfer selected data from one database to another. "Create or combine files containing 'just the data you want' or simply export data from one file to another," says the press release from DataFile, Inc. (P.O. Box 20111, St. Louis, MO 63123).

ProXport specifically imports data from "Sherlock," and "Proscan" (both DataFile programs) and the "Grove FCC Database." If you are using any of these programs, or the Commtronics HB-232 interface, you'll be interested in this program at $19.95 ($3.50 shipping) from Datafile.



Radar Handbook

If you get slapped with a radar speeding ticket on your way to Grandma's this holiday season, there could be a way to dispute it. How to fight a ticket in court is only a small part of the information contained in the *Traffic Radar Handbook* by Donald Sawicki. Every kind of traffic speed measuring system in use, plus radar countermeasures is included in over 100 pages.

Traffic Radar Handbook is available for $14.95 plus $5 UPS from publisher Grove Enterprises, 1-800-438-8155.

Review

By Bob Grove

Junghans Mega Radio Controlled Clock

Sleek, stylish and handsome, this German timepiece has just been introduced in the U.S. by LaCrosse McCormick, 125 South 2nd Street, LaCrosse, Wisconsin 54601 (ph. 800-346-9544). It is billed as "the most accurate clock in the world."

Almost. Even though it is periodically updated during evening hours by WWVB 60 kHz transmissions from the National Institute of Science and Technology (which IS the most accurate clock in the world), most of the time the Junghans Mega depends upon its own internal 32 kHz quartz oscillator.

In our lab test here in the mountains of North Carolina, we found that our metal building offered spotty reception of the 60 kHz reference signal from WWVB (the manufacturer recommends that the desk clock be placed near a window for better reception). Carried outside the building, the clock picked up the signal well.

Nonetheless, one could hardly deny that this is probably the most accurate consumer clock in the world (the manufacturer claims one second every million years!), assuming that the user is within reception range of the Ft. Collins, Colorado, transmitter to which the clock is tuned.

Being receiver controlled, the Mega can suffer from interference caused by appliances, computers, electrical storms, TV sets, radio transmitting equipment and other sources of radio frequency energy.

Powered by a single C cell, the Mega never needs adjustment, automatically sets for daylight savings time, and sports a giant 5-1/4" analog time clock and an LCD date/U.S.time zone readout as well.

Selling for $275 plus $5 shipping, the Junghans clock is an exceptional timepiece, stunning in its sleek silvery appearance, silent in operation, and extraordinarily accurate. It makes a superbly attractive and dependable centerpiece for any radio room.

Bob Grove, WA4PYQ

Realistic® PRO-2028 Desktop Scanner

For those individuals who do not require a scanner with 800 MHz capability, the Realistic® PRO-2028 offers 50 memory channels in ten five-channel banks and a frequency coverage of 29-54, 108-174 and 406-512 MHz. Additionally, five temporary ("scratchpad") channels can store frequencies discovered during the search routine.

Packaging is low profile, and while it could be operated from a vehicle (12 volts DC is supplied by an AC wall transformer), it is better suited for desktop operation.

The dimensions of this entry from Realistic are 9-3/8"W x 7"D x 2"H; weight is 2.2 pounds. The rubberized keys, although quite narrow, are firm and provide positive feel for executing entries.

Audio is very strong through the 2-1/4" top mounted speaker, pleasant to the ear and supported by 1.3 watts of amplification. A 1/8" (3.5 mm) external speaker jack is provided on the rear panel.

A screw-in telescoping whip is also provided, along with a Motorola type external antenna jack. A reset button provides a convenient way to re-initialize the microprocessor in case it locks up from a power glitch.

The LCD window is modestly backlit for night viewing; it indicates frequency, channel number, bank, priority status, delay, lockout status, low and high search limits, as well as program, manual, scan and search status.

Any channel may be selected for priority, two-second rescan delay or temporary scan lockout. A weather key gives instant access to local NOAA weather broadcasts.

Narrowband FM sensitivity between 29 and 174 MHz is specified as 0.5-0.7 microvolts, 1 microvolt in the 406-512 MHz range and 2 microvolts for 108-137 MHz AM aircraft reception.

While these numbers may appear to indicate poor sensitivity, it is perfectly adequate for the majority of listening applications, and should actually reduce interference from strong-signal saturation in metropolitan areas or in locations adjacent to transmitter sites.

Scanning and search rate is approximately 16 steps per second; a non-volatile RAM maintains memory contents during power outages without any backup battery being necessary.

Radio Shack stores introduced the PRO-2028 at a discount price of $119.95; its regular list price is $159.99.

Uniden Enhances BC2500XLT and BC8500XLT Scanners

As pointed out in previous *MT* reviews, the two newest Bearcat scanners have been plagued with complaints ranging from poor sensitivity and severe strong-signal overload on both the BC2500XLT and BC8500XLT to short battery life on the BC2500XLT.

Uniden representatives have notified MT that some complaints have been addressed and corrected in current production models. Several dealers, including Grove Enterprises, have exchanged their stock for the factory-enhanced replacements. Current owners may contact Uniden to arrange free enhancement modifications.

According to Uniden, audio modifications have improved the sound quality of the 8500 by adding more bass, and signal-to-noise improvements have increased sensitivity in both models; there has been no improvement, however, in dynamic range (overload "intermod").

BC2500XLT owners may request a free second battery from the Uniden customer service center; later production changes will reduce the memory keep-alive current by 75%, greatly increasing the charge lifetime while the unit is switched off.

BC2500XLT and BC8500XLT owners who need warranty enhancement may contact the Uniden customer service center toll-free by dialing 800-297-1023.

PRO-2026 Update

Radio Shack has updated their Realistic® PRO-2026 mobile scanner (reviewed Sept. '92), making it more competitive with the pricier Bearcat BC760XLT from Uniden, who, incidentally, also makes the PRO2026.

The improvements include battery backup which replaces the cumbersome third power wire, desktop tilt bracket, and a DC power jack on the rear panel for an optional AC adaptor.

All other functions and specifications, including cellular restorability, remain the same.

Uniden BC890XLT Tone Board Incomplete

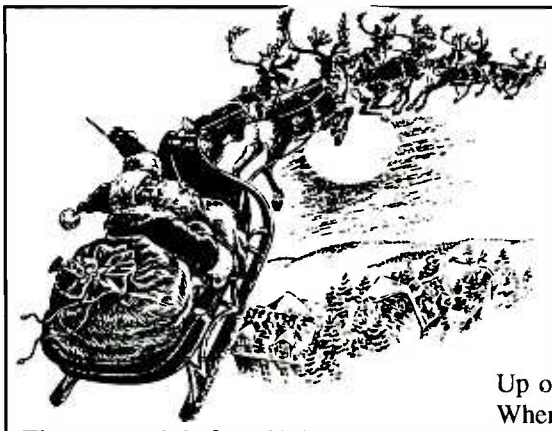
It would appear that the optional CTCSS tone board for the new Uniden BC890XLT tunable scanner (permitting the receiver to select various subaudible tone squelch functions), does not provide all standard tones.

Apparently, the optional board allows detection of tones from 67 to 203.5 Hz, but not the remaining 210.7 to 254.1 Hz.

A spokesman from Uniden admits the limitation, but says that Uniden does not intend to correct the board. If you are choosing the scanner on the basis of its optional subaudible tone capability, you will want to discover which subaudible tones are used by agencies in your listening area before you consider purchasing the BC890XLT. MT

CORRECTION

November issue, P. 94, 9th paragraph; If an error is made while "typing" the alpha display, the entry may be backed out by pressing the SEARCH key, or moved forward by pressing the AUTO key. Capital letters are made while holding the HOLD key, and lower case letters while pressing the LIMIT key.



Merry Monitoring

T'was a week before Christmas
The shopping had ended.
More gifts needed wrapping
Santa's suit to be mended.

Mom baking cookies,
Kiddies were sleeping.
Presents were hidden,
For Christmas safe keeping.

Dad down the basement,
Where no one could see,
He'd lifted a package,
From under the tree.

He slipped off the ribbon,
With delicate manner,
Unwrapped the package,
And found his new scanner.

He programmed each channel,
And then settled down
For hours of the best,
Entertainment in town

Up on the landing,
Where he couldn't see,
His dear wife was grinning,
As wide as could be.

Back down in the basement,
Dad thought he was clever,
He had a head start,
On his best Christmas ever.

Peggy Douglass

Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

Sony ICF-SW30, a Top-Notch Value

Sony usually means the "higher-priced spread." For one thing, their world band radios are often more advanced than those of their competitors. For another, Sony world band radios are made in Japan, where production costs are among the highest in the world.

You may recall that we reviewed the digitally tuned Sony ICF-SW33 in *Monitoring Times* some months back. It's a nice, simple radio, but at $200 somewhat overpriced, given its bare-bones tuning system. We ended the review by suggesting that Sony find a way to offer such a radio at a lower price.

Similar Radio, but Much Less Money

Well, wait no more! Sony has introduced a stripped-down version, the ICF-SW30, which replaces the analog ICF-7601. With a list price of $129.95 and a street price between $110-120, it's a full $70 less than the 'SW33.

The 'SW30, like the 'SW33, is clearly meant to be an uncomplicated radio. There's no keypad or tuning knob, no single-sideband demodulation, no illumination and no headphones. There's no AC power supply, either, even though the radio costs around a dollar every few hours to operate off batteries.

Limited Tuning Choices

Tuning choices are limited to a single-speed up/down slewing control, five shortwave presets (plus ten for other bands), "signal-seek" scanning and a meter-band carousel. The normal version of the radio tunes the regular and Japanese FM bands; the AM band; and shortwave from 3700-4200, 4650-5150, 5800-6300, 6950-7450, 9375-10000, 11525-12150, 13375-14000, 14975-15600, 17475-18100 and 21320-21950 kHz. That's pretty complete coverage, but some listeners will miss the 7455-7550, 9345-9370, 15605-15700, 18900-19020 and 25670-26100 kHz ranges that are increasingly used by some American and other major broadcasters.

Worthy Features for Price Class

However, it's not all stick-shift-and-clutch. There's a 24-hour two-time-zone clock, for example, even though you can't see the clock unless the radio is turned off. Also helpful is a multi-level battery indicator, even if its habit of suddenly shutting down the radio when batteries are low can be disconcerting. You have one minute to change batteries without erasing the memory, a major improvement over the much pricier Sony ICF-2010.

There's also a travel power lock, and FM is in stereo when you listen with headphones. For bedtime, there's a sleep-off control, plus the radio can be set to turn on at any one given time to function as an alarm, or simply to switch on a favorite program. Also for travel, there's a carrying strap, not found on Sangean and some other competing models, and there is a key lock to prevent switching out the station by accident if you're listening on the move. The telescopic antenna rotates and swivels, and there's a flip-out elevation panel so the radio can be operated at a comfortable angle.

With no keypad, only one single (1 kHz) slew rate, and a mere five presets, tuning can be downright annoying. Bandscanning is further worsened because the slewing controls mute out all but odd bits of what there is to hear.

Hearty Performance

Performance? That's another story. No other digitally tuned receiver in or near the 'SW30's price comes close.

For one thing, the '33 has double conversion to reduce image interference. You just don't find that on other digital models under $150, and it's an enormous plus for making shortwave listening sound good.

That's not all. Selectivity is excellent, which helps keep down adjacent-channel interference. Good sensitivity to weak signals means that even Californians can use this model to good effect.

Its through-the-speaker audio, while hardly outstanding, is unusually intelligible. Fading is hardly noticeable, and virtually eliminated are those 5 kHz heterodyne whistles that normally disturb shortwave reception.

Overall: Pick of The Litter

Overall, the uncomplicated Sony ICF-SW30 is clearly the best in its price class. Its tuning configuration is mediocre, and the 'SW33 is not a bandscanner's radio. Yet, it is a real bargain, running circles around any of the digital Chinese off-brand cheapies. Although the 'SW33's street price is just over $100, look for it to break through the $100 price barrier in some outlets before long. MT

Looking for an entry-level receiver to hook your loved one into shortwave listening? Try putting this one under the Christmas tree for quality listening at a low price.

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Band Pass Filter

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ATH-30
1-2800 MHZ
One-Shot Feature

ATH-50
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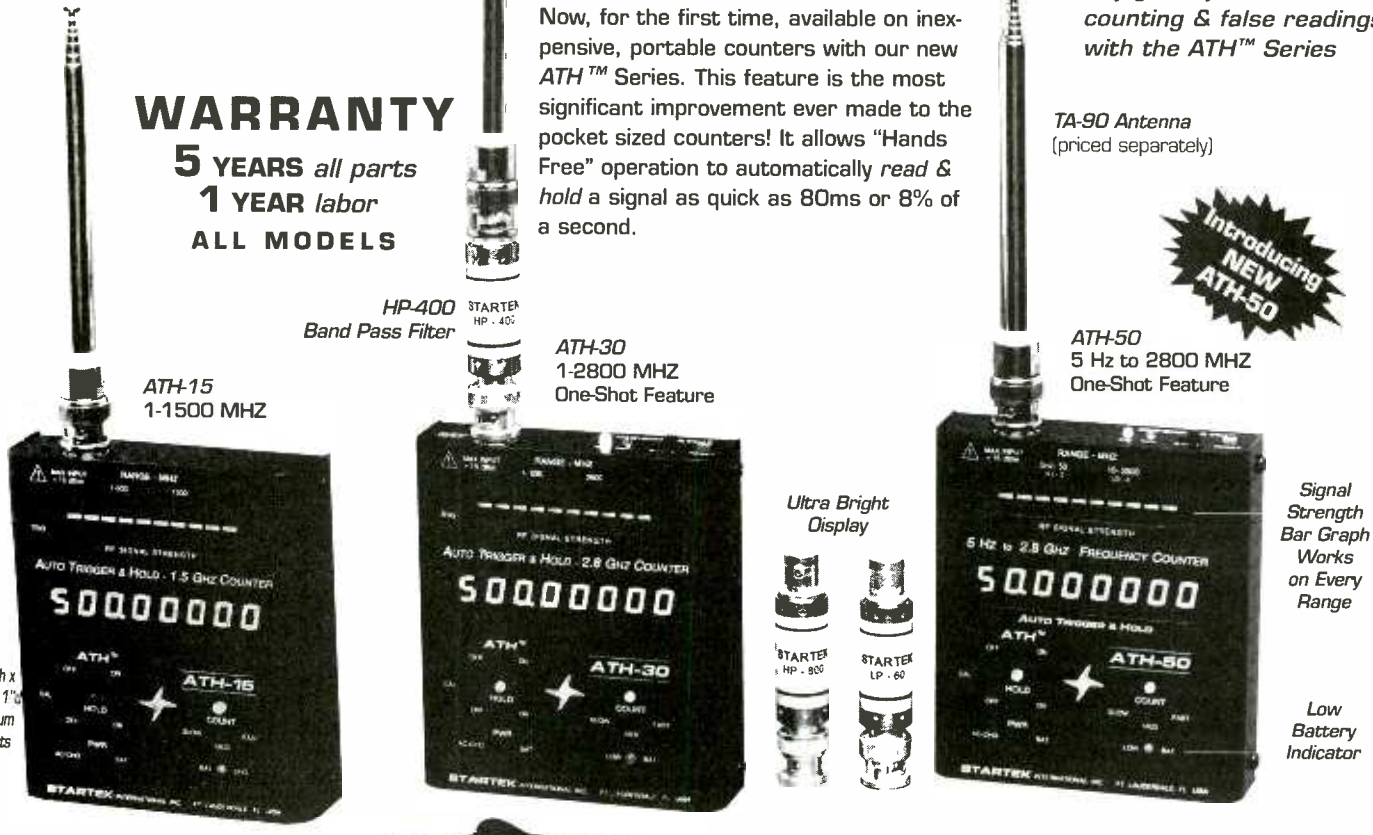

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- **Signal strength Bar Graph**
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ATH-30	1-2800 MHZ, High speed, one shot	259.	~~289.~~
ATH-50	5 Hz to 2800 MHZ, one shot	289.	~~339.~~
HST-15	Optional 0.2 PPM TCXO High Accuracy Timebase (installed)	100.	~~125.~~

Economy Frequency Counter

1350	1-1300 MHZ, 10 HZ Res. 3 gate times, Hold switch	$119. ~~129.~~

Band Pass Filters

Increase range or distance from a transmitter with a Band Pass Filter. <1 dB pass band insertion loss.

LP-60	DC-60 MHZ Usage	$69.
HP-400	400-1500 MHZ Usage	69.
HP-800	800-2000 MHZ Usage	69.
BP-3	Above 3 filters *(SAVE $30)*	$177. ~~207.~~

Accessories

A	*CC-90*	Case for all models	12.
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	*OC-10*	Direct, 50 OHM probe	20.

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John Catalano

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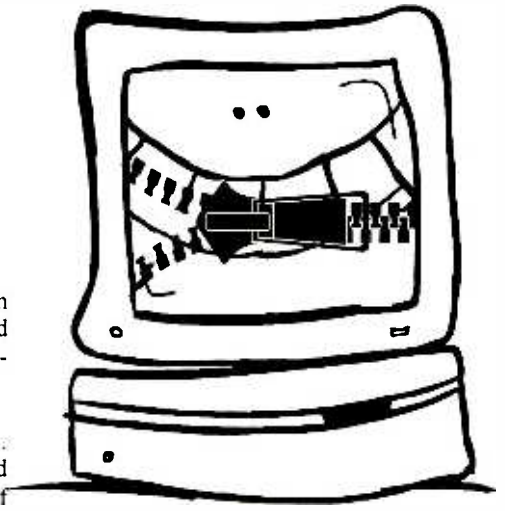
or, Quick — while the glue holds



Each month as I sit down to compose the topics for the next column I am tempted by the lure of new software. Its pull is strong and I justify satisfying the desire by thinking "Well, the *MT* readers really want to hear about this stuff, too!" But this month I am going to resist the temptation in order to bring you a column totally dedicated to your letters concerning topics we've discussed over the past year in this column. That's right; I've super glued all my disk drive doors closed, so here we go.

Lowe's Multiscan

Bill Briley, of Minnesota, is a faithful reader of "Computers and Radio" and is interested in listening "from DC to light," as the saying goes. Bill uses Scancat and an MFJ-1278 with his Yaesu on shortwave and Communications Manager with a PRO-2006 for scanning. He is also active on 2 meter packet. Bill has arrived at this setup after some pain and frustration with other software packages that didn't do exactly what they claimed. This man just doesn't stop; even on a vacation to England, where the charm of the old world can still be found in places with names such as the Cotswolds and Cornwall, Bill was out hunting new radio software!

Bill asks if anyone is using a program called MULTISCAN, sold by Lowe Communications/ Electronics (of the compact receiver fame). He sent me a two-page description of the product which he received from Lowe. If anyone has user details about MUTISCAN, please sent me your comments. Better still, if LOWE is listening— please send me a copy of the program for possible review for use with either FRG9600 or R-71. Thanks again to Bill for his letters and diligence.

Commodore Ware

A few months ago we discussed (no, not disgust) the Commodore C-64 and radio related programs for the old war horse. Well, it appears that Bob Estand of Texas was just waiting for such an article, since he owns *five* C-64s and disk drives! Bob points out that although the C-64 cannot do all that the IBM can do, its price/ performance ratio is hard to beat since it sells for around $65 on the used market. Bob goes on to say that he uses the C-64 for logging and decoding RTTY and CW using the SWL cartridge we mentioned in the article.

Bob is not the only C-64er we heard from. Letters from Scott Billingsley of Arkansas and Rod Sievers of Illinois also extol the virtues of the cheap, but useful, C-64. Scott bought one very cheap, but not working. When you are in Scott's shoes, the people to contact are The Grapevine Group, Inc., telephone number 1-800-292-7445. They carry parts, programming manuals and diagnostic tools for C-64s and Amigas. I think they also do repairs as well. Meanwhile Rod is looking for C-64 software to control his FRG-8800. If anyone can help, write to Rod via this column.

Apple II

But C-64ers are not alone in this seemingly IBM dominated world. John Young, of PA, is trying to find Apple II software to control a Drake R-8. Boy, John, you got me! EBS Consultants, 37 Stockton Rd, Summit, NJ, 07901 make an R-8 program but it's for the IBM. Sorry. John, I haven't turned on one of my Apple IIs for years: with all the radio frequency interference (RFI) they generated I think they will remain a part of my collection, but not for use.

Talking about my computer collection, another reader asks about the TI-99/4A. Alan Masyga of Minnesota asks about this oldie. Alan, I'm sorry to say that, although the TI (Texas Instruments) computer is part of my collection, I've NEVER turned it on! It was brought out at a very bad time with lots of different brand computers flooding the market. TI didn't support it that well with software and few, if any, third party programmers did. I'm sure that someone wrote a radio related program for the TI; I just have not met him yet.

Mac and Radio

Hey Mac! Paul Estes of Illinois and Kirby Ehler of California write in with Apple Mac questions. Kirby is looking for MAC software to control an ICOM R7100, not the R7000. Even calling ICOM directly brought no joy. And Paul is looking for any radio related MAC software. Well, Paul, here are some possibilities:

- ***MAC Shortwave and MAC Mini MUF***
  Kinetic Designs
  P.O. Box 1646
  Orange Park, FL 32067-1646

- ***DX Helper***
  MAC Trak Software
  P.O. Box 1590
  Port Orchard, WA 98366

- ***California Frequency Index***
  Design Equilibrium
  P.O. Box 1245
  Menlo Park, CA 94025
  phone 415-328-9181.

Also DX Computing's ***Shortwave Navigator***, 232 Squaw Creek Road, Willow Park, TX 76087, phone 817-441-9188. This looks like a real good program for the MAC, written by *MT's* program manager Jim Frimmel. Also Kinetic Designs now has a MAC 12Pak: 12 Disks with radio related software for the MAC.

Don't Burn the Books

In one of the columns we looked at the Grove Database. I guess I was misunderstood by Gene Hughes of Hollins Radio Data, who produce *Police Call*, a softback book compilation of frequencies of interest to scanner listeners. In his letter I come off as someone from the classic novel, *Fahrenheit 451*, where book burning is the action of the day.

Gene, that was not my intent. *Police Call, Monitoring America* and the Bearcat series of frequency guides are a valuable part of my listening library. But it cannot be denied that just as CDs have made the LP record medium a thing of the past, so, too, some day the printed page will go. I still have a large LP collection. In fact I keep a copy of *Police Call* right near my scanners—right above my computer. By the way, a new edition of the Grove database is now available. Check in the pages of *MT* for details.

FAX Fixing

Talking about facts (FAX), Milo Hurley of Colorado and Bill Perrelli of Connecticut sent two of the letters I received concerning the column on FAX programs. Milo writes confirming, in his opinion, some of our observations in the AEA and SSC FAX program comparisons. Milo points out (I have yet to verify it) that the AEA FAX's auto start feature will not work in a computer with a math co-processor. Bill relates that he is having trouble copying good FAX images.

Bill, after years of electronic and monitoring experience, I have a Yogi Berra saying for you; "Nothing works as well as a strong signal!"

Kidding aside, it's very true. Also, try tuning on all parts of the signal. Pick a strong signal. Then spend a while tuning from one side band to the other, trying to decode the FAX every 500 Hz of tuning. It's not fun, but you'll find the best combination for the filters in your receiver and your FAX decoder for most other FAX signals.

The Hoka Code 3 decoder, which I think comes from the Netherlands, was mentioned in a recent column. As I said then, I have never heard of anyone using the system. Well, I can still make that statement along with Dick Moon of South Africa and Dick Sharp of Oklahoma. Dick M sent along a glowing review of the Hoka from the British magazine *Short Wave* and says a friend is very pleased with his. Could it be that only one exists and that the owner travels a lot?! Dick S. asks about all of the claims made by Hoka. Sorry, Dick, I can neither confirm nor rebuke their claims. I have tried in vain to get a unit for review. If the guys at J&J, who advertise the Hoka under their Scancat ads, are listening; what about it? The people want to know.

New Wave

Finally, from Tim Main of California comes a news clipping which promises to revolutionize communication. It's a computer and wireless FAX and telephone the size of a checkbook. The company, General Magic, has some heavy backers including Apple. Is it really the future or more Wall Street stock hype? Only time will tell.

Thank you to all the readers who have taken their valuable time to write with good wishes, encouragement, questions, factual observations and opinions. Keep them coming. Next month a gaggle of inexpensive database programs and more. Now, can some one tell me how to loosen super glue by next month? MT

Doug Demaw, W1FB

Some Home Crafting Ideas

Sometimes we are tempted to abandon some projects because a certain item cannot be purchased or seems too complicated to make at home. Other items are costly and the particular project may not merit the outlay of cash for the commercial component. At such times it is prudent to be an innovator and use what's on hand to create the needed item. This article details two gadgets that I constructed for use with a small receiver I built.

Dial Mechanisms

Figure 1 shows a home-made dial with a logging scale from 0 to 150. There is no reason why the dial face could not have been calibrated in frequency. I prefer the numbers, and from them I develop a frequency chart that attaches to the panel of my equipment.

The assembly shown in the photograph consists of a tuning capacitor, a 2:1 vernier drive (behind the square plate), a mounting plate and a dial face. The vernier drive is a Jackson Bros. part that I picked up at a ham radio flea market. It attaches to the square mounting plate with flathead 4-40 screws. The plate has countersinked holes for the screws so that the heads are flush with the plate. Otherwise they would interfere with the round dial plate during rotation. The mounting plate is made from a piece of single-sided PC board. Aluminum or some other metal would be suitable also.

The circular dial face is glued to another piece of PC board material. A hole has been drilled in the center of the material to accommodate the shaft of the vernier drive. Two small screws are visible on the dial face. They affix the plate to the small brass disc on the vernier drive.

The calibration numbers and marks for the dial are made at two times scale and are drawn by hand. A Pilot brand Razor Point, felt-tipped pen was used for the artwork. India ink and a pen will also provide good contrast on a white background. The finished artwork can be reduced to the desired diameter by means of a photocopy machine. Most "quick print" shops will do this job for a nominal fee if you tell them the percentage of reduction you want. Flaws are greatly disguised when artwork is created larger than scale, then reduced upon completion.

By the way, there is no DeMaw Radio Corp., despite the label on the dial. That was added with tongue in cheek for the benefit of my friends.

After completing the artwork and the X2 reduction you should spray the dial face with clear lacquer. Two coatings are suggested to ensure that the paper is waterproof. This will also prevent dirt from discoloring the dial face. I use Krylon brand acrylic spray, No. 1303 for all documents I wish to protect in the foregoing manner. This spray is available at office supply stores.

Some variable capacitors are made with built-in vernier drives. Look for them at flea markets and in surplus catalogs. Rotor plates can be removed to reduce the maximum capacitance of the unit, should there be too much capacitance in the item you purchase.

Vernier drives are not always needed, especially for antenna tuners and the like. The circular dial plate in such instances may be attached directly to the shaft of the tuning capacitor. This will require a small brass or aluminum collet that attaches to the capacitor shaft with a set screw. The dial plate will then mount on the collet by using two small screws in a manner similar to that in Figure 1.

The square mounting plate seen in Figure 1 attaches to the front panel of the equipment. The tuning capacitor behind the plate is attached to the equipment chassis or base by means of an L-shaped aluminum bracket.

A Small Speaker Enclosure

Shown in Figure 2 is a miniature speaker and enclosure that was needed for a small portable receiver I built recently. The commercial counterpart cost roughly $28 and I considered that expense a bit absurd for my particular project. I found that a tuna-fish can would nicely accommodate a 3-inch speaker. The size of the enclosure is such that excellent audio quality results.

The bottom of tuna cans is rounded, whereas the side you open has the conventional raised lip (depending on the brand). Therefore, the bottom

Figure 1: Photograph of a home-made tuning dial. Single-sided PC board stock is used for the square and circular plates. This assembly mounts behind a clear plastic window that is glued to the inner edges of a cutout on the front panel. The window has a vertical line that has been scribed in the plastic and filled with India ink to provide a reference line for the dial numbers.

Figure 2: This home-made speaker enclosure cost pennies because it is fashioned from a tuna-fish can and window screen. The wooden cradle is attached to the can with no. 6 sheet-metal screws that are recessed into the wood. See text for complete details.

of the can must be removed with a hand nibbling tool or saw. Allow a 1/4-inch lip to remain along the perimeter of the can when you remove the bottom. This provides a shelf upon which to glue the speaker and the grill. Clear quick-setting epoxy glue may be used for attaching the speaker and its grill. I used window screen for the grill. Cloth may be substituted if you wish.

The rear of the tuna can is fitted with a circular wooden ring which is 1/4-inch wide and has a diameter that makes it fit snugly into the can. It also is glued to the interior of the can. A back panel is affixed to the wooden ring with two small wood screws. This encloses the speaker case and provides a spot to mount an RCA phono jack for connection of the cord that joins the speaker to the radio.

The base for the speaker is made from wood and is fashioned like a cradle to match the contour of the can, as shown. The finishing touches include painting the wooden base brown and gluing felt to the bottom surface. Wood grain contact paper is used to cover the tuna can.

Larger cans may be used in a similar fashion to provide housings for bigger speakers. A coffee can may, for example, be just right for the job. Let's hear it for recycling! MT

Bill Cheek

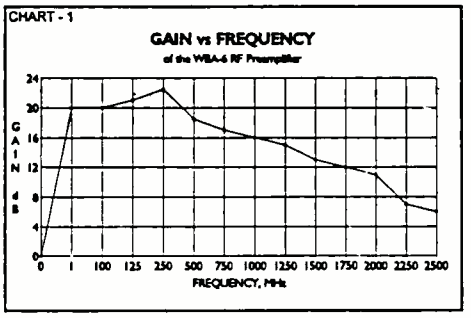
Build A Low Noise, Wideband RF Preamplifier

Merry Christmas! It's not often the home brewer can concoct an incredibly useful gizmo with almost embarrassing ease, but I've got a hot dawg this month for everyone. Radio hobbyists need to amplify radio signals between DC and Daylight, not only for receivers but also for test and measurement applications including frequency counters, RF and bug detectors, signal generators, oscilloscopes, RF voltmeters and more. Our ***WBA-6 Low Noise, Wideband RF Preamplifier*** will suit a variety of non-critical needs for signal amplification from below 1 MHz to beyond 2000 MHz with a noise figure of 3 dB or less. See Chart 1 for the gain curve of this utilitarian gadget, which varies from +20dB at 1 MHz; +23 dB at 250 MHz; +12dB at 1 GHz; to +6dB at 2.5 GHz.

A Basic Understanding

Hobbyists tend to think in terms of pure, raw, unadulterated, rip-snorting, fire-breathing ***GAIN***. Well, it would be nice if gain could be "unadulterated," but unfortunately, we live in a real world. Ideally, gain is a multiplication of signal strength to the exclusion of undesired signals. Unfortunately, a wideband amplifier amplifies ALL signals within its passband, noise as well as desired signals. But there are other nasty signals like internally generated ***noise, intermod, and cross-modulation*** products which are controllable, since they do not exist outside the device. Amplifiers should be designed for ***low noise*** and ***high dynamic range*** to maximize the benefits of gain.

We can home-brew a general purpose, low noise, wideband preamplifier for radio signals from way below 1 MHz to well over 1 GHz using the cheap, simple MAR-6 monolithic amplifier chip from Mini-Circuits, Inc, which is specified to have a performance range from DC to 2 GHz. The dynamic range of the MAR-6 device is quantified as the "*1 dB compression point*" and which equals +2 dBm. This is a ratio of the maximum gain of the device where incoming signals are compressed by 1 dB to the minimum discernible signal level. Plus 2 dBm isn't especially great, but what do you want for a few bucks? The MAR-6, as used in our WBA-6, will do nicely as an experimenter's general purpose preamplifier!



I tried my WBA-6 preamp on my PRO-2004, PRO-2006 and PRO-43 scanners, and a Yaesu FRG-7700 shortwave receiver, and.....well, it definitely made a difference on weak signals, including some that couldn't be heard without it! Like most preamplifiers, it added pseudo-signals of its own, but this can be overlooked in certain situations.

I also used my WBA-6 as a preamplifier for a hand-held frequency counter and a handheld RF (bug) detector; it really excelled in these applications! If you use a frequency counter to determine frequencies used by security guards, stadium ushers and such, you'll find that the WBA-6 can double or triple the effective range! If a walkie talkie triggers your frequency counter from 20-ft away, the WBA-6 will increase the range to 40-ft or more. The WBA-6 also lends itself as an oscilloscope and RF voltmeter preamplifier where circuit signals might be just a bit too weak to detect.

You'll need only a few parts as shown in Table 1. Although I said this project was going to be easy, you can't just slop it together and expect to enjoy the benefits of low noise and high gain over a wide bandwidth. Electronic design and construction techniques are "anything goes" between DC and maybe 500 kHz. Up to about 25 or 30 MHz, only basic RF techniques are required; then, between 30 MHz and 300 MHz, it becomes important to choose the right components and pay close attention to how they are laid out. Above 300 MHz (UHF), there is almost no room for error in following established guidelines for components and circuit designs. The WBA-6 can perform up to 2 GHz and beyond, so very special care must be exercised in its construction if you hope for lots of wideband gain with a low noise figure!

TABLE 1: PARTS LIST

Ckt Sym	Description	Source & Part No.
C-1,2	Capacitor, 0.01-µF, chip	● PCC103B
C-3	Capacitor, 1.5-µF, chip	● PCT5155
Cf	Capacitor, 470-pF, feedthru	*Optional*
L-1	Ferrite bead	● P9823
R-1	Resistor, 511Ω, metal film, chip	● P511FBK
U-1	Monolithic amplifier; DC-2 GHz	● MAR-6
Misc	Printed Circuit Board, 2-sided	● 276-1499
Input	BNC Chassis Jack, female (In)	● PE4014
Option	BNC Chassis Jack, male (Out), or	● PE4211
Option	BNC Male-Male Adapter (Out)	● PE9000
Kit	20-dB Gain Preamp Kit, 2GHz	● WBA-6

The Easy Way!

Electronic Rainbow, Inc. offers the WBA-6 as a kit of all required parts, including precision printed circuit board, for $19.95. The kit comes with adequate instructions to assemble, install, and operate. See the sidebar for where to get the WBA-6 Kit or the discrete parts if you want to roll your own. You can fabricate your own WBA-6 from the diagrams and guidance offered here if you are handy with electronic assembly and know something about the right parts for VHF-UHF circuits; otherwise, the kit might be the best bet.

Fabrication of the little printed circuit board will be the most difficult part of this job; remember, VHF-UHF circuits have little tolerance for sloppiness or deviation from specs. You will need a double-sided PC board that measures about 20mm x 30mm. All the traces and foils are lines or rectangles, so the standard etching process might not be as good as if you use a sharp utility blade to slice through the copper foil and remove the unneeded strips by hand. A dental plaque scraper is a good tool for working the copper foil off the board after it has been scored/patterned with the knife. Figure 1 presents the simple schematic diagram and Figure 2 shows the foil pattern, parts placement, and important dimensions of the PC board.

After the PC board has been properly prepared, the rest of the job is a snap. Position and solder the components as shown in Figure 2. The MAR-6 amplifier chip has a little dot next to one of the four leads which identifies the INPUT pin, so take note and solder it in place and the other three leads will be positioned just right. Silver-bearing solder is best for VHF-UHF circuits, but conventional tin/lead will work just fine. Use as little solder and heat as possible, but enough of each to flow smoothly and evenly.

The choke, L-1, is a ferrite core slipped over a short length of solid hookup wire. You don't want to use a regular coil type of choke here, which doesn't work well at VHF/ UHF frequencies. A 20-µH chip-style choke *might* work here, if specified for UHF frequencies, and if you can find one. Otherwise, use the specified ferrite bead slipped over a piece of solid hookup wire and keep the leads *short*! Other than that, assembly of the PCB is straightforward so long as you know to use chip-type capacitors and resistors.

The WBA-6 amplifier board should be installed inside a metal enclosure, the smaller, the better. BNC chassis-mount connectors should be installed on opposite ends of the enclosure at points closest to the RF Input and Output points on the WBA-6. Keep lead length the BNC connectors and the WBA-6 as short as possible. The RF Out end of the box should be fitted with a ***male*** BNC Chassis jack to facilitate easy connection to scanners, frequency counters, etc. without the need for an adapter. You can use a female BNC jack at each end if more convenient, but then you'll need a male-male BNC adapter for some occasions. (See the Parts List).

FIG-1: WIDEBAND RF PREAMPLIFIER - SCHEMATIC

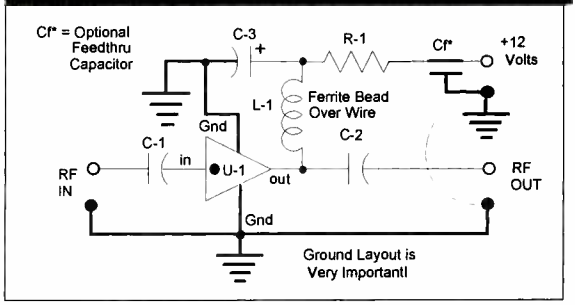
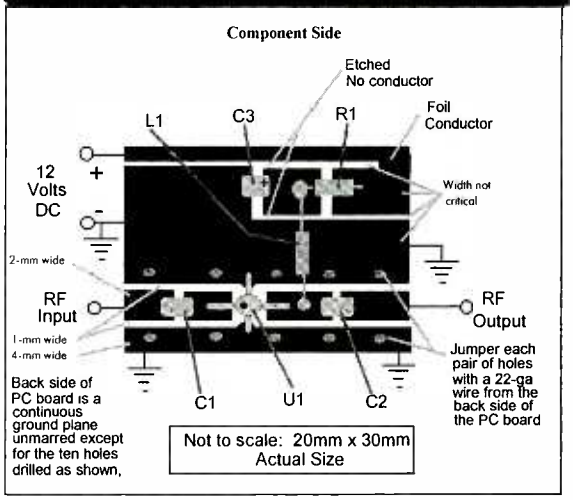


FIG-2: WIDEBAND RF PREAMPLIFIER - Parts Layout



For my prototype unit, I built an enclosure out of double-sided printed circuit board material soldered together into a rectangular box, with one side temporarily left open for access. Each end cap of the box was drilled and fitted with a BNC chassis jack, female on the RF In end and male on the RF Out end. The box was made exactly long enough for the WBA-6 board to fit precisely between the center lugs of the BNC connectors. The WBA-6 board was soldered along one of its long edges to the inside surface foil of the enclosure. The rig looks terrible, because of the soldering it took to "weld" the seams of the box together, but the double shielding is total and the preamp works fine.

After the unit was tested, a mating panel was soldered over the open side to RF-seal the enclosure. A small hole drilled through one end admits a wire for easy connection of DC power. A tab was soldered to the outside ground foil of the box for the (-) power lug.

For critical needs, it is advisable that DC power to the preamp enter by means of what is called a *feedthru capacitor* to provide the utmost in isolating the WBA-6 from outside interference. Any value from 470- pF to 1000 pF will be fine. The RF-Out end of the box feeds scanners, frequency counters, RF voltmeters, etc. The RF-IN side accepts a portable antenna or a coaxial cable that goes to a remote antenna. Be sure to label the RF In (antenna) side of the preamp.

All that's left to do is connect the (-) side of a 12-volt DC power source to the ground shell of the enclosure and the (+) side to the wire that goes into the box. Power requirements are about 16-ma @ 12-v. Regulated DC is preferred for the most stable operation but a filtered 12-v will be fine for most cases. As a matter of fact, a 9-v battery is ample where you don't need maximum gain from the WBA-6.

So now, what can we expect from the WBA-6? A lot, actually. 20-dB is a multiplier of 100; 10-dB is a multiplier of 10 and each 3-dB increment is a multiplier of 2. So 23-dB gain multiplies signals by 200. 12-dB multiplies signals by a factor of 16. For you math wizards, the dB (decibel) is defined as ten times the logarithm of the ratio of one level of ***power*** to another, typically, Power Out to Power In, or:

$$dB_{Gain} = 10 Log_{10} \frac{P_{Out}}{P_{In}}$$

Voltage (E) and current (I) ratios may be expressed:

$$dB_{Gain} = 10 Log_{10} \left(\frac{E_{Out}}{E_{In}}\right) or \left(\frac{I_{Out}}{I_{In}}\right)$$

Most hobbyists won't care about the actual gain in a given application, but there are times when reduced gain is better than running full bore. For instance, that 23 dB of gain at 250 MHz is likely to cause overload and interference in a scanner, so a method of gain control is ideal. In fact, most receivers cannot benefit by more than about 10 dB of gain.

Gain control is possible by varying the supply voltage to the WBA-6. A range of 5 to 13 volts offered a good range of control for me. This can be accomplished by grounding *one end lug* of a 2 kΩ to 5 kΩ potentiometer, and feeding the +12 volt supply to the *other end lug* of the potentiometer. Connect the WBA 6's power feed line to the *center lug* of the potentiometer, and you're all set. Purists will use a variable, regulated power supply instead of the potentiometer method.

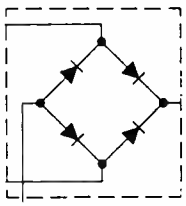
By and large, the WBA-6 will be least satisfactory for receivers and most satisfactory for instrumentation. However, I did observe some outstanding performance in the 760 MHz-1300 MHz range on my PRO-2006 where it occasionally made a difference between hearing and not hearing.

If you like the WBA-6, then contact Electronic Rainbow, Inc. for their catalog of other kits, some of which can be combined with the WBA-6 for "tandem" or cascaded operation, for example, amplification of stronger signals like television and for CATV distribution systems, including satellite.

Well, that's it for this month, folks. If you want to get ready for next year, check out a new IC chip in Radio Shack's arsenal, the *Voice/Record Playback IC, cat # 276-1325*. I'll bring you a slick circuit or two for that chip soon. MT

Errata

November issue, p. 103; The diode bridge in figure 2 should be connected as follows:



Sources and Resources:

1 **WBA-6 Kit**
Electronic Rainbow Inc.
6254 La Pas Trail
Indianapolis, IN 46268
(317) 291-7262 FAX: (317) 291-7269

Electronic Parts and Supplies:
2 Digi Key Corporation
701 Brooks Avenue South
Thief River Falls, MN 56701-0677
(800) 344-4539 FAX: (218) 681-3380

Hosfelt Electronics (*Surplus Outlet*)
2700 Sunset Blvd.
Steubenville, OH 43952-1158
(800) 524-6464 FAX: (614) 264-5414

5 Radio Shack Stores

MAR-6 Monolithic Amplifier
3 MiniCircuits, Inc.
PO Box 350166
Brooklyn, NY 11235-0003
(800) 654-7949 FAX: (417) 335-5945

Coaxial Connectors and Accessories:
4 Pasternak Enterprises
PO Box 16759
Irvine, CA 92713
(714) 261-1920 FAX: (714) 261-4751

Be sure to tell these suppliers you waw them mentioned in Monitoring Times.

W. Clem Small, KR6A, CET

Long, Short and Shorter Antennas

You may have heard the old-timer's antenna rule that says that the longer and higher you site your HF antenna the better will be your reception. Generally speaking, this is true, but we live in a practical world and make antennas of practical lengths and heights. So, even when you can't put up the longest and highest antenna imaginable you can still usually get a lot of good communications going with shorter antennas.

This month we review a very short antenna, the Funtenna by Comm-Rad Industries; a short antenna which is long compared to the Funtenna, the 40 ft. Palomar White Box Antenna; and also give simple plans for making a longer antenna (hundreds of ft.) that has been a favorite monitoring antenna of mine for years.

Most antenna designs seem to do a decent job of filling the niche for which they were designed. But it is very important to keep in mind the phrase "the niche for which they were designed." A small table top antenna is not built to compete with a longer, higher outdoor antenna. For shortwave monitoring we are usually well advised to put up outdoor antennas, but for most of us our antennas are compromises between what we'd like to have and what we actually have time, space and money to acquire.

The Funtenna

The Funtenna is designed to sit on the table beside the receiver and can be used whenever you cannot put up a longer indoor or outdoor antenna. This antenna has a plastic dome-shaped base approximately 11" wide at the bottom, 8" high with its whip collapsed and 43" with the whip extended. This size is comparable to many active antennas; however, the Funtenna is passive (no amplification) rather than active in design. Thus it has much less gain than an active antenna, but it also will not be troubled by amplifier overload problems such as intermodulation distortion (intermod) or desensitization.

Covering a frequency range of 6.8 to 90 MHz, the Funtenna provides reception of signals arriving at your monitoring post with moderate to strong signal strength. When I compared its HF performance to that of an 8 ft. wire strung from the ceiling to the receiver the two antennas performed at about the same level; sometimes the Funtenna gave better results on a specific signal, sometime the wire was better. Similar results were obtained on VHF using a 4 ft. piece of wire strung up the wall above the radio; sometimes the Funtenna gave a better signal, sometimes the wire was best.

The Funtenna is equipped with a bandswitch which must be turned to a position appropriate to the received signal's frequency. The manufacturer indicates that further "fine tuning" is possible by varying the length of the whip; however, I was not able to improve signal strength by this method. On the HF band the Funtenna provided many listenable signals. On VHF there is not much activity in my area in the 30 to 90 MHz portion covered by this antenna; however, I did monitor a number of what appeared to be telemetry signals and steady carriers. There are no TV stations in my area in this portion of the band. However, the antenna performed satisfactorily on the entire FM band (88 to 108 MHz).

Funtenna is available from Comm-Rad Industries, 4230 East Lake Road, P.O. Box 88, Wilson, NY 14172 (phone 716-773-1445) for $79.97.

The White Box

Palomar Industries manufactures the model WB-1 "White Box" antenna, a 40 ft. stranded, copper-covered steel longwire which utilizes a magnetic longwire balun. They also manufacture the MLB-1 magnetic longwire balun separately which can be used for constructing your own White-Box type antenna.

I was sent a WB-1 for evaluation and, although this is an outdoor antenna, I initially tested it by laying it out on the ground floor in my wood frame house. It did a fair job in this position, outperforming a table-top whip antenna and a shorter (8-ft.) indoor wire antenna. The antenna was then mounted outside as the manufacturer recommends. In my installation the far end was about 30 ft. off the ground and the feed end about 4 ft. off the ground. The White Box proved to be an excellent performer, bringing in many readable signals from 100 kHz to 30 MHz.

A particular virtue of the White Box Antenna is that it allows the use of coaxial cable lead-in. Although the wire element can be connected directly to the antenna input of your receiver without use of a lead-in, it is usually desirable to have the active element stop some distance from the house and feed the signal from antenna to receiver with coax. The coax shields the signal from the high level of electrical noise present near most buildings serviced by electrical power lines. A coax lead-in can provide reduced received noise and considerably improved weak-signal reception.

The White Box antenna is available from Palomar Engineers, P.O. Box 462222, Escondido, CA 92406, phone 619-747-3343. The MLB-1 magnetic longwire balun is $39.95 plus $4.00 shipping/handling.

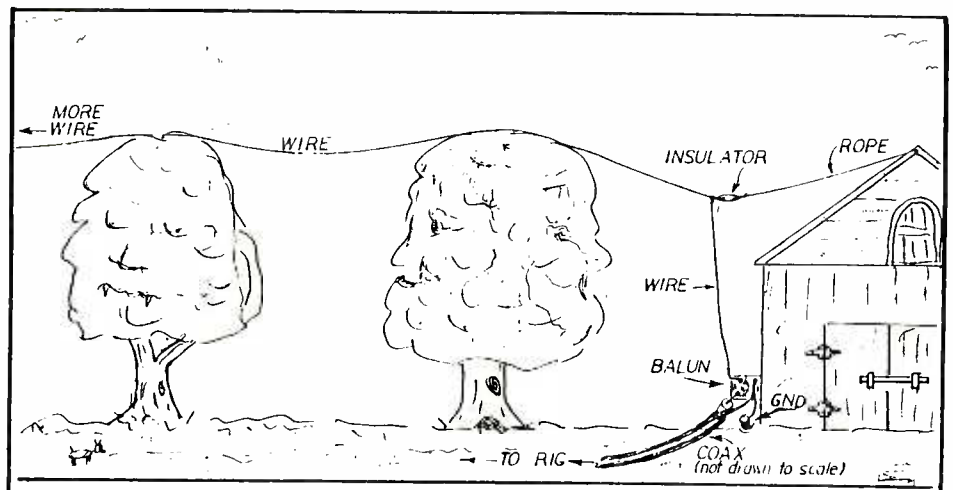


FIG. 1. A BALUN-FED, LONG-WIRE ANTENNA.

An Old Favorite

Over the years one of my favorite monitoring antenna designs has been one which I devised using a 4:1 airwound balun (the Palomar MLB-1 should also work well in this antenna for receive-only applications) and a longwire (fig. 1). Since I use a balun capable of handling the power from my ham transmitter, the antenna functions well for transmitting, too. My rural haunts generally allow a longwire of 200 ft. to 400 ft. in length. I have found that such an antenna gives excellent reception from LF through the HF band.

Let's Make One

1. Run the long wire for the maximum distance your real estate will allow—up to several hundred feet.

2. Mount it as high as is practical. If the wire is well insulated, it can rest on the tops of trees along its length.

3. Attach one end of the longwire to one high-impedance terminal of the balun.

4. Connect the other high-impedance terminal of the balun to a good earth ground.

5. The center conductor of the coax lead-in is then connected to one low-impedance terminal of the balun.

6. Connect the other low-impedance balun terminal to the coax shield and also to the earth ground used for the high-impedance connection. Any good coax of any impedance can be used.

7. Connect the lead-in to your receiver and you're ready to monitor.

If you live in lightning country, don't forget lightning-induced damage protection. The minimum is to never operate during weather likely to produce lightning and always disconnect and ground the antenna when it is not in use.

RADIO RIDDLES

Last Month

After discussing the cat-whisker antenna last month, I asked, "Where did we find the term 'cat whisker' applied in old-time radio and where is it used in more modern radio technology?"

The old timers among us will instantly recall that cat whiskers were the short springy wires used to contact the surface of the metal-crystal detector in the old-time crystal radio receivers. This cat whisker was moved about on the crystal surface until the most sensitive spot was located and then left in place for listening.

More recently the small thin wires which contact the surface of the semiconductor material in some diodes and transistors have been known as "cat whiskers," no doubt in honor of their old-time counterparts.

Next Month

The name of the Palomar "White Box" antenna, reviewed above, would seem to be a "reverse English" reference to the infamous "black box" so often mentioned in electronic circuit problems. What does this term "black box" mean to an radio engineer or technician?

We'll have the answer to this month's riddle and much more in next month's issue of *Monitoring Times*. 'Til then, Peace, DX, and 73. MT

ask bob

Bob Grove, WA4PYQ

Questions or tips sent to "Ask Bob," c/o *MT*, are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of *MT*.

Q. I am noticing increasing numbers of small dish satellite antennas on commercial buildings, schools, chain stores, motels, car rental agencies, and so on. What are they and what frequency range do they operate in? (Joe Connelly, North Bergen, NJ)

A. These are satellite-linked data channels which share transponders on the Ku band (12 GHz) domestic satellites.

Q. How many hours should a fully-charged NiCd battery be used so that it doesn't develop "memory effect"? Why do manufacturers build in this effect anyway? (Al Shack, Simi Valley, CA)

A. "Memory effect" doesn't exist. It was an early description of an isolated earth satellite condition decades ago in which the constant recharging by the solar cells prevented the batteries from efficiently discharging, thus reducing the high and low limits of its normal voltage range.

There is, however, a condition known as "voltage depression" in which, unless a NiCd is fully discharged from its full 1.2 volts per cell down to 1.0 volts, the battery won't return to its full capacity. Discharging the battery once or twice will, however, correct the problem. Modern NiCd chemistry has overcome this problem as well.

Q. I saw someone carrying what looked like a home-made scanner. Is it possible to build your own hand-held scanner? (Mike Williams, Denver, CO)

A. Possible, but impractical. Modern handheld scanners are extremely sophisticated and utilize microminiature parts that need to be assembled with automated equipment, not with tweezers and a soldering iron.

If you do build your own scanner, you aren't in violation of patents held by scanner manufacturers; just don't try selling your scanners on the retail market!

Q. Why does my clock radio keep excellent time, but my expensive shortwave receiver clock loses several seconds per month? Both are operated by the AC mains. (Tom McKeon, Indianapolis, IN)

A. The timekeeping accuracy of a digital clock is determined by its internal quartz-crystal oscillator, not by the 60 Hz line frequency. A good oscillator in a cheap clock is going to provide better time than a lousy oscillator in an expensive radio!

Q. I sometimes hear on the Bearcat scanner a "tooting horn" sound followed by a growling. There may be voices in the background. What causes it? (Al Shack, Simi Valley, CA)

A. It sounds to me like classic intermodulation ("intermod") from a nearby digital paging transmitter. When two strong signals mix together in a scanner due to overload, multiple additional signal frequencies are produced.

High-power paging transmitters are famous for their assault on scanner listeners, and if their signals are mixed with other two-way users, you will hear the interference as a distorted blend.

Q. My Yaesu FRG8800 is about six years old. Occasionally, received signals disappear (although the S-meter still registers reception) and the frequency digits on the display start blinking. Is there a fix? (Glenn Blanco, Aurora, CO)

A. According to a Yaesu service station, the problem is caused by the PLL (phase-locked loop) circuitry coming unlocked. It can be cured by replacing resistor R18 on the PLL board, now 22,000 ohms, with a 4700 ohm value.

Q. I was told that five years from now scanners will be manufactured that are "digital"; what does that mean? (Mike Williams, Denver, CO)

A. It is quite possible that the spokesman was referring to digital speech processing (a form of scrambling) or digital signal processing (DSP), a means of signal detection.

It is presently unlawful to manufacture a descrambler, but DSP is a distinct probability in coming years. It is already being done with state-of-the art commercial and military gear, and provides excellent interference rejection.

Q. Is there a way to receive up-to-the-minute records of new business band licensees from the FCC, especially here in Hawaii? (Rodney Souza, Honolulu, HI)

A. One way is to request access to the files at your nearest FCC field office. Another is to subscribe to such services from any of a number of Washington, DC, research publishers of just such information. A recent list of those companies is available from the FCC.

Q. How can I eliminate interference from a local AM broadcaster which I hear all over my Sangean ATS-803A shortwave radio? (Victor MacDougall, Lake Worth, FL)

A. If you receive the interference even without an external antenna connected, then the signals are penetrating the plastic cabinet and there is nothing you can do short of shielding the radio in metal screening, or conductive-spraying or metallizing the inside of the cabinet.

If the problem is present only when an external antenna is plugged in, you will need a tunable preselector like the Grove TUN-4 or those of other manufacturers, or a band-reject (or notch) filter designed to remove signal in the medium wave broadcast band.

Q. I intend to buy one of the leading communications receivers, but I have been told that neither the internal speaker or the external speaker accessory sold for that receiver is anything to write home about.

Can I use a bookshelf hi-fi speaker just as well? Is the impedance going to be matched? (Harry Darr, Newark, DE)

A. Absolutely. Inexpensive extension speakers available from a variety of consumer electronics

Bob's Tips of the Month

Memory Clear for the Realistic® PRO-43

To erase all memory channels on the popular Realstic PRO-43 handheld scanner, turn the unit off, hold the zero and CLEAR keys down, then switch the scanner on.

Recorder Volume Control

Many voice-activated (VOX) tape recorders have trouble recognizing desired programming from the background noise; often this means that the recorder will continue to run without voice or music present.

Michael Denney of Carrollton, Georgia, found an accessory that solved the problem for his PRO-46 scanner. The Koss VC/20 volume control, available for about $9 from Wal-Mart, simply connects between the radio's earphone jack and the recorder's audio input.

outlets are usually infinitely superior to the matching speakers offered by receiver manufacturers, and at a fraction of the cost.

Owners of matching speakers would be well advised to consider opening the cabinet and replacing the internal speaker itself with a quality, off-the-shelf replacement speaker of the same size and close impedance.

Another trick is to pack the speaker enclosure with cloth like an old towel to absorb reflections which cause distortion. Try closing the enclosure with a masonite (or similar) back as well.

If you don't like the "new" sound, you can always go back to the original.

***Q.** In an earlier column you mentioned "Autotalk", a San Francisco traffic reporting system. I can pick it up on my videorecorder, but I can't hear them on my scanner. Is it a subcarrier system? Joel Rubin, San Francisco, CA)*

A. Being unfamiliar with your local system, I will reply generically. Subsidiary Carrier Systems (SCS; formerly SCA) are not confined to FM broadcasters; any broadcaster, including TV, can use it.

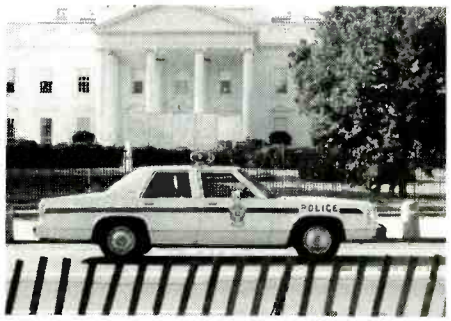
Transmissions are done on a subscription basis, requiring a decoder (demodulator) to hear the norrower-modulated subcarrier which is hidden in the wide bandwidth of the broadcast signal. MT

Club Circuit

Welcome to ...
Capitol Hill Monitors

The Capitol Hill Monitors, a local chapter for both RCMA (Radio Communications Monitoring Association) and NESN (Northeast Scanning News), has been active for over six years, and for the past two years has published an independent newsletter for the region (DC, MD, northern VA and southern DE). Its 100 or so members are drawn primarily from the urban DC and Baltimore areas.

Meetings and tours are on an irregular basis, so call to discover the next planned event; non-members are welcomed. This past October the group toured Arlington County's brand-new emergency communications center, featuring computer-aided dispatch. Another way to find out about meetings is through the *Monitor* newsletter; dues are $8 and entitle you to 12 issues (checks payable to Alan Henney).



A U.S. Park Police cruiser keeps close watch on the White House the day of the PLO-Israeli treaty signing. The CHM has more exciting monitoring opportunities than most clubs.

Also check in to CHM's Scanner/Shortwave Net, hosted by Ken Fowler, at 7:30 pm on first and third Mondays on 146.91 MHz. Computer users may log on to Jack Anderson's Frequency Forum computer BBS at 703-207-9622. For more information about the club, contact Alan Henney, 6912 Prince Georges Avenue, Takoma Park, Maryland 20912-5414; 301-270-2531, 5774 (fax). Please enclose SASE for reply.

Alan sent along this photo of the U.S. Park Police cruiser parked in front of the White House on the day of the PLO-Israeli treaty signing. Park Police SOD units, says Alan, operated on 166.725 MHz. See what you're missing if you're not a member of CHM?!

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.

Mountain NewsNet: James Richardson, P.O. Box 621124, Littleton, CO 80162-1124, (303) 933-2195. Colorado statewide. Public Safety notification group.

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.

New Zealand Radio DX League: P.O. Box 3011, Auckland, New Zealand. MW, SW, FM, TV. *New Zealand DX Times.*

New Zealand DX Radio Association: Mr. R. Dickson, 88 Cockerell St., Brookville, Dunedin, New Zealand. MW, SW, amateur and utilities. *Tune-In.*

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 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.

New Listings:

International Listeners Organization: Mohsin Abbas, St. Nisar Ali Shah Ahamed Pura, Sheikhupura, Pakistan, 1-(50359) 2-(50561). South Asia. Broadcasting. *Listener Times.*

Scanning Wisconsin: Ken Bitter, Dept. MT, S. 67 W. 17912 Pearl Dr., Muskego, WI 53150-9608, (414) 679-9442. Wisconsin. VHF/UHF. *Scanning Wisconsin* ($2 for sample)

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Dec 4	**Grayslake, IL**	CAP Late Fall Hamfest 15220 West Redwood Lane, Libertyville, IL 60048. Location: Lake County Fairgrounds Route 45 & 120, 7am-??, $3.50 admission.
Dec 4	**No Olmsted, OH**	North Coast ARC/Dan Sarama, KB8A, (216) 267-5083 Location: St. Clarence Church, 8am-2pm, $3 admission, talk-in on 145.29 and 224.76 repeaters.
Jan 2	**South Bend, IN**	Hamfest and Computer Expo/Michiana Valley Hamfest Assoc. SASE to MVHA, 21970 Kern Road, South Bend, IN 46614 or call Denny, KA9WNR, 7pm-10pm EST at 219-291-0252 weekdays. Location: Century Center Convention Center.
Jan 15	**Hammond, LA**	Hammond Hamfest/SELARC, P.O. Box 1324, Hammond, LA 70404 Location: SE Louisiana Univ., Upper Level of the University Ctr.
Jan 22	**Loveland, CO**	Northern Colorado ARC Winterfest Swapmeet Musser Moore, N0UMN, (303) 221-3698. Location: Larimer County Fairgrounds, 9 am-3pm, $3 admission, $8 tables. Talk in on 144.515/145.115.
Jan 23	**Southfield, MI**	Swap & Shop/Southfield HS ARC, Robert Younker, Southfield HS, 24675 Lahser Road, Southfield, MI 48034. Location: Southfield HS, $5 admission.
Jan 30	**Villa Park, IL**	Hamfest '94/Wheaton Community Radio Amateurs P.O. Box QSL, Wheaton, IL 60189 Location: The Odeum Exposition Center, 8 am-3pm, $8 admission.

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

DX RADIO TESTS

Information on more tests such as these can be found in *DX Monitor*, the official publication of the International Radio Club of America (IRCA). IRCA is a club devoted to the hobby of hearing distant stations on the standard AM broadcast band. *DX Monitor* is published 34 times a year and contains members' loggings, articles on radio stations, receiver reviews, technical articles, DX tips and other material of interest to the Broadcast Band DXer. For a sample copy of *DX Monitor*, send 1 US dollar or 3 IRCs to: IRCA, 11300 Magnolia #3, Riverside, CA 92505, USA.

This month's tests were arranged by J.D. Stephens for IRCA.

Sunday, December 5, 1993: KXXY-1340, 101 NE 28th, Oklahoma City, OK, 73105, will conduct a DX test between 1:00 and 1:30 am EST. The test will include Morse code, tones and country music. Reception reports may be sent to: Mr. Britt Lockhart, Chief Engineer.

Monday, December 6, 1993: WAJR-1440, 1250 Earl L. Core Road, Morgantown, WV 26505-5896, will conduct a DX test between 12:00 and 4:00 am EST. The test will include Morse code, voice IDs and country music. Reception reports may be sent to: Mr. Jim Murphy, Director of Engineering.

Monday, December 6, 1993: CKX-1150, 2940 Victoria Ave., Brandon, Manitoba, R7A 6A5, Canada, will conduct a DX test between 3:00 and 3:30 am EST. The test will include Morse code, tones, voice IDs and country music. Reception reports may be sent to: Mr. Ron Thompson, TV Meteorologist. **Power for this test will be 50 kW omnidirectional**

Monday, December 13, 1993: WNEZ-910, 130 Birdseye Road, Farmington, CT, 06032, will conduct a DX test between 1:00 and 1:30 am EST. The test will include Morse code and voice IDs. Reception reports may be sent to: Mr. Bobby Gray, KA1ZHH, Chief Engineer.

Monday, December 20, 1993: WDAS-1480, Belmont Ave., and Edgely Dr., Philadelphia, PA, 19131, will conduct a DX test between 1:00 and 2:00 am EST. The test will include Morse code, tones and black gospel music. From 1:00 to 1:30 am, power will be 5 kW, then switched to a power of 1 kW from 1:30 to 2:00 am. Reception reports may be sent to: Mr. William R. Sullivan, Chief Engineer.

Monday, December 20, 1993: KWNC-1370, P.O. Box 607, Quincy, WA, 98848-0607, will conduct a DX test between 3:00 and 3:30 am EST. The test will include Morse code, tones and "classic" music. Reception reports may be sent to: Mr. Donald Lockwood, Chief Engineer.

Monday, December 27, 1993: KVON-1440, 1124 Foster Road, Napa, CA, 94558, will repeat a DX test which ran in October between 3:00 and 3:30 am EST. The test will include Morse code and tones. Reception reports may be sent to: Mr. Michael Martindale, KB6RQH, Director of Engineering.

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.

ProXport 3.0. Powerful, query builder, editor. Export, merge Grove's 1993 FCC Database. Extract just the data you want. HB-232 users! Ask about package price on Sherlock/ProXport. 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.

PROPAGANDA BROADCAST TAPES! Tokyo Rose, Axis Sally, Lord Haw-Haw, Others. Authentic, rare recordings of famous broadcasts. Info $1. One Hour Audio Cassette $11.95. Wilson, P.O. Box 37324, Milwaukee, WI 53237.

R-390-A SALES & SERVICE.
P.O. Box 3541, Toledo, OH 43608.

R-390-A Top and Bottom Covers
(419) 726-2249.

WANTED: McINTOSH 4200 STEREO RECEIVER, Pay Finder Fee. Also ICOM R-100 (IF Out Jack Modified Preferred). 800-872-4685.

FOR SALE: BC2500XLT, John (203) 254-9549.

WANTED: Anyone with information on scanners to computer from Satellite Communications please contact 403-886-2924 collect.

YUPITERU MVT 7100 MULTIBAND RECEIVER only three months old, still under warranty in box with all accessories included. Call 519-945-6370.

YAESU FRG-8800 HF ALL MODE RECEIVER with FRA-7700 active antenna. Excellent condition. $780 new, sell for $350. Also Yupiteru MVT-5000 HANDHELD SCANNER. 100 ch., 25-550 and 800-1300 MHz (including cellular). Like new for $275. Call 205-836-5211 after 6 pm CST or leave message.

FOR SALE: MINT JRC NRD-525 RECEIVER $900; NVA-88 SPEAKER $50; RTTY DEMOD CMH-530 $90; EXTENDER BOARD CMH-365 $150; PRINTER CABLE $50; OKIDATA PRINTER 180 mint $220; GE SUPERADIO III $50. Walter (904) 421-9246.

UNIDEN MR8100 MOBILE SCANNER, turbo scan, full 800 through computer software which is included, $175. UNIDEN 200XLT HANDHELD SCANNER, faster scan, full 800, 400 channel conversion. Looks rough but runs great! $150. 1-701-746-8792.

HAMS SWAN 350C TRANSCEIVER 500 watts and DENTRON CLIPPERTON L LINEAR AMPLIFIER 2000 watts, excellent condition, original manuals, $500 for all. Money Order or COD, you pay shipping. (512) 991-1002, Dave.

FOR SALE: SANGEAN ATS-803A RECEIVER $95. Call Gene at (206) 675-7414.

FOR SALE: KENWOOD R-5000 RECEIVER with following options: AM filter, narrow 1.8 KC sideband filter, voice synthesizer, and VHF converter. W/boxes and manuals. Excellent condition but has intermittent scan. $750 firm. Pat Brown, WB5JHG, 1805 Crooked Creek Lane, Pearland, TX 77581, (713) 996-5920.

SONY AN-1 ACTIVE ANTENNA, excellent, $60, call David at (206) 282-1209.

PRO-2004, 400 channel, complete 800, $225. Call (703) 586-1221.

FOR SALE: SYNCHRONOUS DETECTOR FOR 455 kHz IF RECEIVERS. Dramatically improves AM: reduces fading distortion, selectable sideband cuts interference. Kit: $139. Built/Tested: $199. Info: $3. Steve Johnson, P.O. Box 3420, York, PA 17402-0420.

• "I enjoy my *MT* subscription and use almost every part of it, including the propagation charts as a way to estimate when I might be able to listen to what frequencies. Since I also play extensively with computers and satellite technology, I would be interested in seeing these sections expanded. In particular, I would be interested in the following: an occasional article locating all satellites and occasional articles noting what audio/data is available on what transponders."

Richard Walker
Pensacola, FL

For comprehensive coverage of what's up there, I recommend you wait for a new edition of "Communications Satellites" by Larry Van Horn. A new edition of this definitive work is planned for publication within the coming year. Meanwhile, look for several feature articles on a variety of aspects of satellite monitoring in the first half of 1994.

• "I am a lieutenant in the United States Navy. I have served on two ships, the first as an engineer and on the second as communications officer. I am currently in Boston, MA, where I am a naval ROTC instructor at Boston University. My gear is pretty simple: a DX-440 with a simple dipole antenna, but it works pretty well for my purposes. I have enclosed the English portion of Radio Norway International's schedule. I think everyone will want to tune in for their coverage of the 1994 Winter Olympics.

Kristin Bakkegard
Brighton, MA

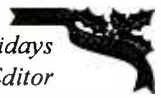
Watch for a full feature article on radio coverage of the Winter Olympics to be published in the January issue of MT.

• "I enjoy your publication very much. It is one I find myself reading in its entirety. Last year I had the local library subscribe and checked out each issue a month late due to checkout policy. This year I am subscribing myself to have it more current.

"I would also like to say that I not only like your articles but I also find nothing objectionable. That is a rarity in publication these days. My compliments to the staff for putting together such a fine magazine."

John Flowers

I don't think I can improve on my closing from last December, so perhaps it bears repeating: In the spirit of the season, why not give a gift subscription of *MT* to your local library, or to someone who can't afford it? Perhaps you have an overseas pen-pal who would share it with his or her friends. Help us spread the spirit and share our good monitoring times!



Happy Holidays
from Rachel Baughn, Editor

Season's Greetings

From our MT and Grove family to yours!

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Rachel Baughn, Editor

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Ike Kerschner, On the Ham Bands

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Larry Miller,
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W. Clem Small, Antenna Topics

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JRC NRD-535D

"Best Communications Receiver"

World Radio TV Handbook 1992

"Unsurpassed DX Performance"

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Setting the industry standard once again for shortwave receivers, the NRD-535D is the most advanced HF communications receiver ever designed for the serious DXer and shortwave listener. Its unparalleled performance in all modes makes it the ultimate receiver for diversified monitoring applications.

Designed for DXers by DXers! The NRD-535D (shown above with optional NVA-319 speaker) strikes the perfect balance between form and function with its professional-grade design and critically acclaimed ergonomics. The NRD-535D is the recipient of the prestigious World Radio TV Handbook Industry Award for "Best Communications Receiver."

- Phase-lock ECSS system for selectable-sideband AM reception.
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- A superior front-end variable double tuning circuit is continuously controlled by the CPU to vary with the receive frequency automatically. The result: Outstanding 106 dB Dynamic Range and +20 dBm Third-Order Intercept Point.
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JRC Japan Radio Co., Ltd.

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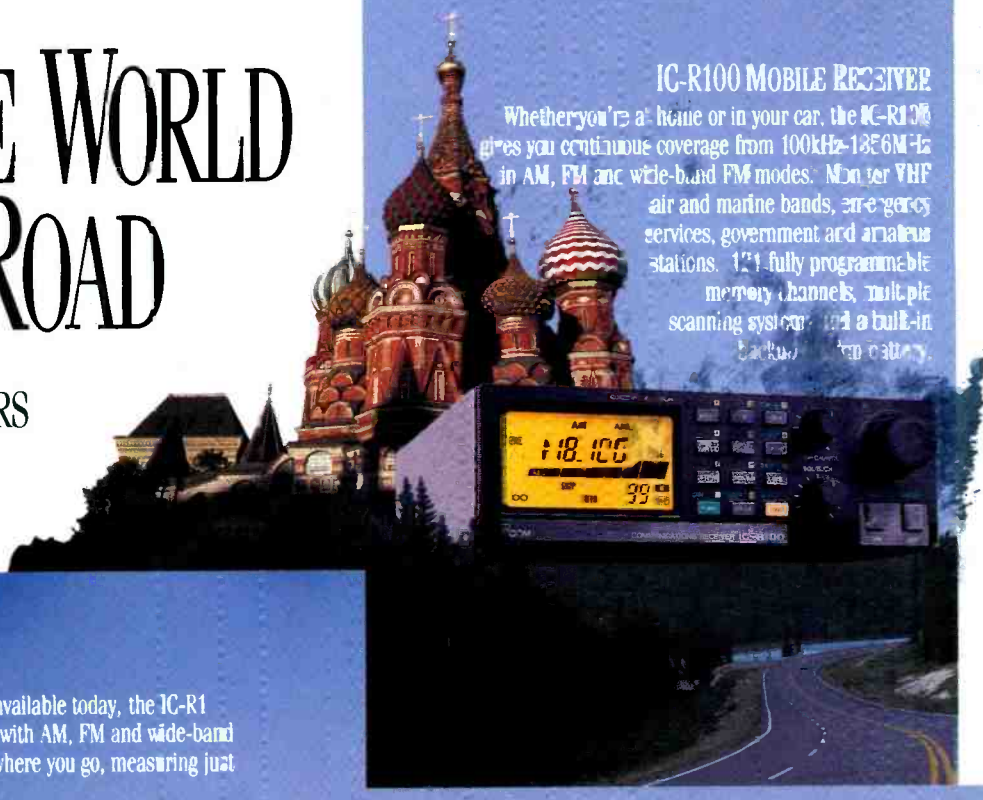

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The smallest wideband handheld available today, the IC-R1 continuously covers 100kHz-1300MHz with AM, FM and wide-band FM modes. This tiny receiver goes anywhere you go, measuring just 1.9"W x 4.0"H x 1.4"D.

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